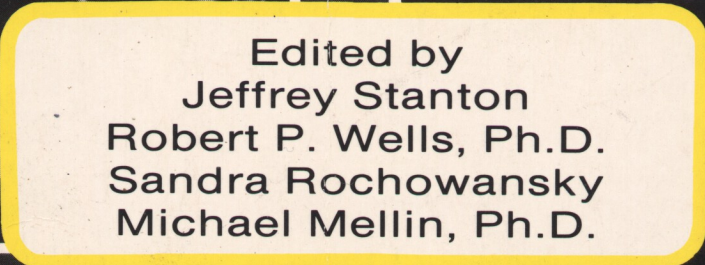# ATARI SOFTWARE

Edited by
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Winter Supplement

The Book of
ATARI
SOFTWARE
1983

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INTRODUCTION

The Winter Supplement is the final update of *The Book of Atari Software 1983*. It is intended to keep you informed about some of the software released for Atari computers since the Spring/Summer double supplement was published. It is designed to be a money-saving reference guide consulted by software dealers and users alike.

To say that 1983 was less than a successful year for Atari, Inc. is a great understatement. The spectacular failure of the 1200XL, price wars with other manufacturers of low-end personal computers, and the strong encroachment of other vendors on the VCS game market have all contributed to the company's losses (upward of half a billion dollars). Third party vendors have also been reluctant to commit themselves to developing software until Atari's future course seemed clear.

Atari, however, is in the market to stay. They introduced an upgraded line of computers and improved software this winter. Atari's emphasis on video games remains strong, but the balance is slowly shifting toward a greater variety of software offerings, especially in the fields of education and business. Atari's present advertising campaign reflects this shift, at last getting away from the phrase "Have you played Atari today?" and presenting the image of an general purpose home computer. Of all the low-cost computers available, Atari still offers the best graphics and the most reliable performance by far. With the introduction of enhanced hardware, a greater variety of more powerful software, and an entire new line of accessories, Atari's problem in 1984 may be the inability of production to keep up with demand.

Apology In Advance

While we have attempted to include the majority of known and available Atari software, we realize that there are a number of programs which have not been included. In most cases, omissions are a result of our not being aware of a program's existence or our inability to obtain and review a program in time to meet our press deadlines. We apologize for these omissions, and will try to keep you as current as we can with supplemental issues of *The Book*. We must also mention that software vendors change addresses frequently, and that the suggested retail prices of various products likewise change often. The information published here was correct to the best of our knowledge at the time we went to press, but is subject to change without notice.

We have made every effort to present fair and objective evaluations of Atari software. But it is appropriate to point out here that neither our reviewers nor The Book Company will be held liable for any mistakes or omissions that have occurred. We welcome comments from our readers, of course, and in future editions we will correct or revise errors which are brought to our attention.

Remember: *The Book* is merely intended as a guide to owners and would-be owners of Atari computers. As a consumer, it is your responsibility to do whatever further investigation you deem necessary before making your software purchases.

Thanks To The Reviewers

Once again we must gratefully acknowledge the reviewers who have made possible the 1984 edition of *The Book of Atari Software*. They have labored many hours to share their knowledge and experience with other owners of Atari computers. Our thanks to:

Bill Bacon	Tricia Jordon	Robert Sachs
Derrick Bang	Gary Kevorkian	K. S. Sadlier
George Barti	Harry Koons	David Sanford
Norma J. Berinstein	Michael La Rochelle	David H. Schubmehl
Louis A. Cortez	Jan Lauritzen	Kim Schuette
Jay B. Dorsey	Mike Marrowitz	Hank Shiffman
Charles Dougherty	Mike Mikus	Tom Simondi
Michael Duncan	David W. Neuendorf	Robert A. Smith
Walter Germer	Bruce D. Noonan	Jane Suenderman
Donald M. Ginsberg	Peter L. Norloff	David Tomczak
R. DeLoy Graham	Dan Pinal	Keith Valenza
Allen Harberg	Jordon Powell	Ray Watt
Lenny Harrison	Roger A. Pruitt	Gordon Wong
Jan Hasley	Francis G. Rabuck	Don Worth
Jeffrey Imig	Davey Saba	

Criteria

Each program included begins with a listing of basic facts and a summary rating, followed by the review commentary. We employ the familiar A through F grading system:

A	B	C	D	F
(Superior)	(Good)	(Average)	(Poor)	(Unacceptable)

Basic facts about a program include its name, the company which manufactures it, its suggested retail price, and several categories which are not entirely self-explanatory:

Hardware Requirements: The hardware and other peripheral units required in order to run a program. Usually the minimum Random Access Memory (RAM) is listed in an abbreviated form; for example: "32K." 16K is standard, and programs requiring more RAM will not operate on the Atari 400 or 600XL unless memory has been expanded. Other programs may require a printer or some other enhancement to run properly. These, too, will be abbreviated: e.g., "48K, modem," "64K, two disk drives," etc.

Language: Programs are written in a variety of programming languages apart from Atari BASIC. Some of these require extra memory cards, operating systems, or other enhancements. Machine language, for example, runs faster than BASIC and is therefore desirable in games or graphics programs. You should be aware of the programming language before you buy a program.

Availability: This is on a one to ten scale, indicating whether a program is available from few dealers or many (10 is nearly all dealers).

Disk or Tape: Some programs come on cassette, to accommodate those Atari owners who do not have disk drives. A few programs are available in both forms. An asterisk ("*") indicates that the disk or tape is copy protected.

GENERAL

These are grading criteria that apply to almost all programs, regardless of category:

Overall Rating: This takes all facets and evaluation criteria of the program and, to some extent, comparable programs, into consideration.

Value For Money: Is the purchaser getting what he is paying for? Is it good value compared with similar programs? Are there "extras" available at reasonable prices?

Vendor Support: Does the software company back its product? Are they available to answer questions? Are they courteous and helpful? Will they replace a defective program disk, get you up and running quickly, repair damaged data disks? Are the prices charged for support excessive?

Documentation: Does the documentation answer all questions clearly, and is it extensive? Does it offer a tutorial? Is it well indexed? Is the printing easy to read, and the layout attractive and easy to follow? Does it make use of illustrations? Does it explain processes in technical jargon or plain English?

Error Handling: Does the program "crash" during execution? Are there proper error-trapping routines? Are the error messages you get on-screen mysterious or easily understood?

Reliability: Does the program consistently do what it's supposed to do? Does it do less than it claims to offer?

Visual Appeal: Does the program look attractive and well-designed on the screen? Is color used effectively? Does it produce clear graphs, charts, reports, and other illustrations? Does it scroll smoothly from screen to screen? Is it easy to design your own screens? Are its menu options easily understood?

BUSINESS

As the title suggests, those programs of a "practical" nature apart from educational and utility packages, even if designed for home use and not the office. One specific criterion not described above is:

Ease of Use: Are the screen designs and documentation clear and well laid out, enabling the new user to run the program with a minimum of difficulty? Does it involve annoying features, such as a lot of disk swapping or slow response time, in its operation?

EDUCATION

Any program which purports to teach or offer instruction. Specific criterion includes:

Educational Value: How effectively does the program teach its subject? Is the subject matter of limited or broad appeal?

UTILITIES

In general, those programs whose purpose is to enable you to use your computer more effectively. One criterion especially important to this category is:

Usefulness: Does the program offer a good, necessary, or important tool to the user?

ARCADE GAMES

This category refers to those games considered to be of the "shoot-'em-up" or "action" type. Specific criteria for this category include:

Challenge: Does the game challenge the participant, or is it a game one will tire of quickly?

Controllability: How responsive is the game to either keyboard, paddle, or joystick control?

Creativity: Has the author been creative and imaginative, or not?

Game Concept: Is the idea behind the game sound? Does it require strategy and offer a goal?

Game Depth: Does the game have much of a scenario? Does it offer a number of challenging levels?

Skill Involved: Does the game require strategy and skill, or is it based mostly on luck?

Holds Interest?: Is this game one you would like to play over and over, or is it one that you will soon lose interest in?

Graphics: Was excellent use made of the computer's graphics capabilities, or not? Are the visual effects pleasing or dull?

ADVENTURE GAMES

These games are those considered to be of the "puzzle," text, or (maze) adventure variety. Special criteria for this category includes:

Puzzle Quality: For adventures, how complex are the puzzles or riddles in the game? Does the mapping follow a logical sequence?

Originality: Is the game novel and inventive, or does it smack of conformity in concept and execution?

Vocabulary: For adventure games, how good is the parser, or how well does it understand words and commands that you input?

Text Quality: Are the descriptions imaginative, or bland?

Save/Restore: Does the game have a save-game feature, allowing you to continue later, and how accessible is it?

Difficulty: What is the level of difficulty encountered in this game? Is it challenging, or suited to novice adventure game players?

Graphics and **Holds Interest:** as above.

MISCELLANEOUS

You will notice that some programs are discussed but not rated. This will occur for one of several reasons:

(A) We received the program too close to the press deadline to thoroughly review it. We felt, however, that the program was of sufficient merit and/or importance to warrant some kind of consideration. Given the time constraints, we tried at least to describe it. A complete review should follow, either in a supplemental issue of *The Book* or a later edition.

(B) Some programs fall into such specialized categories that a reviewer with expertise in that particular area was not immediately available. However, the program appeared to be of sufficient worth to merit some comment.

(C) The Book Company is a division of a larger organization, Arrays Incorporated, which is engaged in software publishing. We have always provided impartial evaluations of software products, and therefore any programs that could involve a conflict of interest are not rated.

BUSINESS

ALOG MAILLIST

Company: ALOG Computing
Language: BASIC
Hardware Requirements: 32K

Department: Business
Sugg. Retail: $39.95
Availability: 5
Disk or Tape: Disk

OVERALL RATING	A-	DOCUMENTATION	A-	RELIABILITY	A
EASE OF USE	A-	VALUE FOR MONEY	B	ERROR HANDLING	A
VENDOR SUPPORT	B	VISUAL APPEAL	A		

ALOG Maillist is a small database system dedicated to mailing list applications. It is very convenient for handling mailing lists of 130 entries or less (assuming a 48K system), and can accomodate larger lists as well. All operations of *Maillist* are menu-driven. The menus are presented in harmonious colors, and can be used with a minimum of keystrokes. Capabilities include: saving, loading, appending and merging files; entering, editing, searching, and sorting records; printing records and mailing labels; and other frequently used disk utilities that don't invoke DOS.

All records have the same ten fixed-length fields. In addition to the expected fields for a mailing list, there are fields for code, extra, phone number, and a second street address. The code field is a single character used for classifying records according to any scheme you might devise. Extra allows for up to twenty-five characters of supplementary information useful for sorting or other purposes. The optional second street address field is especially useful for many foreign addresses and addresses with box or apartment numbers.

Data entry and editing is easy, with a few exceptions. Consistent with the program's effort to minimize keystrokes, the cursor jumps to the next field when the maximum field length has been reached. Unfortunately, this leads to a confusing mixture of data entry with and without required Returns. It is easy to skip a field by hitting Return when it is not necessary. A more serious problem for producing good quality labels is that upper case is required throughout. This seems to be an utterly pointless program limitation. Finally, it is hard to keep track of your own "code" field system without a means of displaying them on the screen.

Successive searches can be made on any one field using a full range of logical search criteria. Sorting can be done on up to three fields simultaneously, in ascending order only. The maximum time to sort 130 records on three fields is only about ten seconds. Usually one or two seconds will be sufficient.

File manipulation facilities are provided for handling mailing lists of more than 130 records. You can split a mailing list into segments of the alphabet (or use other appropriate schemes) and handle the list in portions of 130 records or less. Files may be merged, split, or appended to make this type of manipulation as convenient as possible. Handling of large lists could never be as easy with this arrangement as with a single file, but the system does work. A second disk drive is supported as well.

The documentation is complete and clearly written. There is plenty of unintimidating detail for the novice or non-programmer. On the other hand, technical information is provided to allow more advanced users to access files from BASIC. A business with a huge mailing list and other personal data to manage will prefer a bigger database system, but those with simpler needs will find *ÀLOG Maillist* easy on the pocketbook and a pleasure to use.

ATSPELLER

Company: APX
Language: Machine
Hardware Requirements: 48K

Department: Business
Sugg. Retail: $39.95
Availability: 4
Disk or Tape: Disk

OVERALL RATING	B−	DOCUMENTATION	C+	RELIABILITY	B
EASE OF USE	B	VALUE FOR MONEY	B+	ERROR HANDLING	B
VENDOR SUPPORT	C	VISUAL APPEAL	C		

Atspeller checks your spelling on any word processor that produces standard Atari DOS text files. Older versions require two disk drives, but newer versions, such as *Atspeller, Rev. 2*, need only one. The program works differently than its competitors, simultaneously scanning a 30,750 word dictionary and your text file. To limit references to the dictionary, the program stores the 300 most commonly used words in memory and refers to portions of the dictionary only when this fails. This system means that you have virtually no limit on the size of a single disk text file. If you include many words in a personal dictionary, the scanning rate increases from the normal speed (about 180 words per minute).

Output goes to the screen or line printer. The screen method lacks a pause feature. The screen highlights questionable words in inverse, while the printer underlines them with asterisks throughout the double-spaced copy. When you correct words, a new text file is created on disk. Whether you correct each flagged word or skip it, you still need to consult a dictionary. The program dictionary includes many more common words than *Spell Wizard*, for example, and flagged less than half the unknown words in the same test file as the other program did. In addition, you can create your own dictionary, which a sort program arranges alphabetically. Since the program sorts 1,000 words at a time, this must indicate the limit of the user-defined dictionary.

Atspeller is fairly easy to work with. Although it does not have a search dictionary feature to be used in conjunction with the correct word feature, it does let you correct your text file with a book dictionary. Since it flags fewer unknown (but correctly spelled words) than its competitor, a casual writer might prefer it.

THE COLOR ACCOUNTANT

Company: Programmer's Institute
Language: BASIC
Hardware Requirements: 48K

Department: Business
Sugg. Retail: $79.95
Availability: 3
Disk or Tape: Disk

OVERALL RATING	C−	DOCUMENTATION	C−	RELIABILITY	C−
EASE OF USE	C	VALUE FOR MONEY	C	ERROR HANDLING	B−
VENDOR SUPPORT	D	VISUAL APPEAL	C		

The Color Accountant, a financial management program, records checks and deposits; balances your checkbook; records savings, loans, and investments; prints checks, budget spending, and savings; graphs financial data; keeps track of bills to pay and appointments to keep; and records and prints mailing lists. It also provides a checkbook search that lets you find a check by number, name, category, subcategory, or date. You can also compute and print out your net worth and income expense (balance sheet) statements.

The program comes on three disks. Ten menu options help you access the necessary information, but in order to get started you must use either the standard chart of accounts supplied with the disk or create your own. The account numbers have areas reserved for assets, liabilities, equity, income, and expenses. You can enter ninety-nine major categories and ten subcategories. Loading the chart proves of importance because many of the programs require this file in order to process your records. When I used the program, the chart did not save to disk properly on four out of six attempts, preventing the use of the interrelated programs. I also had problems determining which of the three disks plus my data file disk to insert, and the manual offered little help.

The appointments calendar runs slowly, but feeds data either to the screen or the printer. In general, I noticed slow key response on many inputs, and it took some time to load the programs. I found the color graphics less than exciting, on top of which the manual did not explain what the numbers with the graphs meant. The account names for the bar graphs often got cut off at the end. Worst, the documentation, although lengthy, proved totally inadequate. I see no reason why the company could not write clearer and simpler explanations so that an average user, like myself, could understand the program after several hours of study. I called the company four times for help

when the programs failed to run properly, but no help was available. (I suspect a flaw in saving the standard chart of accounts.)

The program has merit, of course, since it does access a large number of categories for information storage and retrieval, but overall I found it unreliable and cumbersome to use.

DESK SET

Company: The Programmer's Workshop
Language: BASIC
Hardware Requirements: 40K

Department: Business
Sugg. Retail: $24.95
Availability: 5
Disk or Tape: Disk

OVERALL RATING	C	DOCUMENTATION	B+	RELIABILITY	C
EASE OF USE	C+	VALUE FOR MONEY	C	ERROR HANDLING	C
VENDOR SUPPORT	B	VISUAL APPEAL	C		

Desk Set is designed to help you save time in organizing and planning personal calendars and appointment schedules. Two modules make up the program, a Calendar (perpetual and appointment) and a Card File (for names and addresses). The Card File lets you enter, maintain, sort, and edit up to 200 addresses to make up a disk-based mailing list. The file greets you with the options Add, Edit, Print, New, Sort, and Exit. Add gives you a blank form to enter name, address, city, state, zip code, contact name, and phone number. Edit lets you change previous entries. Print calls up addresses to the screen or to the printer based on the search criteria All, Area Code, From-to, Selected Files (by file number), State, and Zip. New completely erases your previous card file and gives you 200 new blank forms to fill out. You must exercise great care with this option, since you could inadvertently destroy a lot of work. The program asks "Are you sure?" before you type the final "Y" to destroy old data. Sort alphabatizes the file according to the order of entry. If you enter first name/last name, the program alphabetizes by first names. One problem occurs when the list of addresses is short. The program sorts the entire file, empty or not, making the process a lengthy one even for a short list.

The Calendar contains room for 400 appointment entries. However, the program must load it and save your card files into memory before you can start using Calendar. You specify the month, year, and day, then receive the option to view appointments for the day, exit, go forward one day, or back up one day. If you view appointments, you face a breakdown of the day into hours. You can change, add, print, or remove (kill) entries. Should you fill all 400 files, you can choose the Kill option and erase all files before a specified date to free them for future use. The New option erases all 400 files. Finally, while in Calendar, you can call up any of your card files to reference an appointment.

You would need to have an extremely busy schedule to find this type of program advantageous. Working with the computer, waiting for each module to load, and waiting again if you need to change the program probably demands more time than if you simply jotted the information down in a regular calendar. It really isn't a function best done by a computer.

ELECTRONIC NOTEBOOK

Company: Amulet Enterprises, Inc.
Language: Atari BASIC
Hardware Requirements: 24K

Department: Business
Sugg. Retail: $29.95
Availability: 2
Disk or Tape: Disk

OVERALL RATING	C	DOCUMENTATION	B−	RELIABILITY	C
EASE OF USE	C+	VALUE FOR MONEY	C−	ERROR HANDLING	C
VENDOR SUPPORT	B	VISUAL APPEAL	C		

Electronic Notebook, essentially a doodling pad, tries to do too much. A special graphics set allows limited drawing capability, but it is not a graphics package. You cannot change from black and white, choose between a joystick or light pen, or vary the texture of your drawings. You can dump your drawing to the printer, save it on disk, and intermix drawings and the graphics 0 character. You can also set up tables with labeled columns and update them as needed. You can set up a mailing list, but the program will not alphabetize it or check for double entries. The

program includes a string search feature, but it doesn't work for title and column headings. The search string when located appears at the top of the screen. You can review subsequent screens, but not previous ones, and cannot even return to the beginning of the current screen. Error handling is mediocre. If you accidentally tell the program that you have more than one disk drive when you only have one, it crashes. Indicating end-of-file (Control-3) also causes the program to crash. Once in the update mode, you cannot escpae without writing to the disk. The program tries to do too many things and does none of them well. You would be better off investing in a program which tackles only graphics or just creates text files.

FILE-FAX

Company: T.M.Q. Software
Language: Machine
Hardware Requirements: 48K

Department: Business
Sugg. Retail: $29.95
Availability: 6
Disk or Tape: Disk*

OVERALL RATING	A–	DOCUMENTATION	A–	RELIABILITY	A–
EASE OF USE	A	VALUE FOR MONEY	B+	ERROR HANDLING	A–
VENDOR SUPPORT	B	VISUAL APPEAL	B+		

File-Fax, an excellent disk-based file management program, emphasizes easy use and foolproof data entry. This combination ideally suits the casual computer user or the clerk/secretary likely to use the program once the database is defined. The ability to store a database on up to four disks (assuming you have four disk drives) allows for very large databases. In fact, the program's ability to compress data lets you store a thousand 100 byte-long data records (100K) on an 88K disk. You design databases on a full-screen editor using all of the Atari's screen editing features. The final format chosen appears on a single screen. You define each of as many as thirty-one fields as having a specific number of characters, specified on the screen by brackets. After designing the screen format, you specify the attributes of each file. This lets you specify the data entry as alpha, numeric, plus/minus signs, blank spaces, dollars and cents, yes/no, or any combination of the above. You can also leave the attributes open so that the field will accept any kind of data. This gives you the advantage of idiot-proofing the process of entering records. The computer beeps if you try to enter an alpha character in the phone number space, for example. You design the attributes at the same time that you define the data entry page. The Control-arrow keys move the cursor from field to field, while moving the <> keys over a one-line list at the bottom of the screen selects attributes. The Return key verifies your choice while the Space bar negates it. You can also define up to eight specific sorts on a field at this time.

You can easily search for and revise records, searching by exact name or by wild card on any field or group of fields. Multiple wild cards are allowed. You can search by match or by range. Supposedly, you can print any record on your line printer by pressing the CTRL Shift @ keys, but I couldn't get this feature to work. I suspect a problem with the multi-machine documentation. The output to the printer or screen looks like a row-column report. The screen is eighty columns if you use an eighty column printer, and scrolls left as you move the cursor beyond the normal range. The ESC key toggles between the record format display and the report format display. Each field is transferred one at a time from the record format display to the position desired in the report format display. The CNTR T key makes the transfer. Naturally you can correct any misalignments with the Atari's screen editing keys. You can save up to four different report formats to disk with this program.

A label making feature proves helpful for mailing lists. You can instruct the program to suppress trailing blanks so that the first and last names follow each other without unsightly gaps.

The documentation consists of a large tutorial. While a good learning tool, it is not very convenient for later reference. The main fault lies in its general reference to five or six specific machines. Although a one-page list shows specific differences between machines, the manual always refers to specific control keys that work by default. The documentation also fails to make clear the capacity of the system.

The program proves useful for producing simple databases or mailing lists. It does, however, have numerous limitations. A stand-alone package, it cannot interface to other packages such as *VisiCalc* or word processors. It also lacks the ability to redefine the database and thus prohibits the addition of more fields. It possesses limited mathematical function capabilities. Its main advantages are its easy use, good input error checking, large number of fields, and ability to sort to great depth.

No one database will suit everyone. *File-Fax* is certainly no better or worse than its competition, so in considering it you must decide if it or another database closely matches your specific needs.

FAMILY FINANCES

Company: Atari
Language: BASIC
Hardware Requirements: 32K

Department: Business
Sugg. Retail: $49.95
Availability: 9
Disk or Tape: Disk

OVERALL RATING	B+	DOCUMENTATION	A	RELIABILITY	A
EASE OF USE	A-	VALUE FOR MONEY	B+	ERROR HANDLING	A
VENDOR SUPPORT	A-	VISUAL APPEAL	B-		

Family Finances analyzes home budgets in more ways than most families are ever likely to use, but it will not create a budget. That is an important distinction; the program promises to "organize and analyze personal finances," but that is useless unless a budget exists. You should get professional help—from an accountant or banker, for instance—before expecting *Family Finances* to work miracles.

The package is further limited by its ability to track only one year's worth of data. Homeowners concerned about a rising utility bill, for example, could not compare March 1983 with March 1984 to decide whether the new solar panels were cost-effective.

Family Cash Flow, the first of the program's two disks, records income/expense information in up to thirteen categories for each of twelve consecutive months. Once the information is entered, it may be recalled by category or month. The disk comes with information in the form of a sample session which, combined with step-by-step instructions, makes all the options understandable.

The second program, Family Budget, is excellent for identifying trouble spots. It blends proposed and actual income/expense in every possible combination to illustrate errors in judgement: budget expense (or income) vs. expense (budget or actual), and single category income/expense. All this can be presented for a particular month or the entire year. The first half of the package, in other words, is a ledger; the second half analyzes and averages the data.

Suppose, six months into the year, you notice that expenses have exceeded the proposed budget by several hundred dollars. (That empty spot in the bank account might be a slight hint.) A quick look at Yearly Budget vs. Actual Expense reveals the deficit to have occurred in January. Closer examination of that month shows an unexpected "automotive" expense which covered that sudden transmission trouble. Subsequent months will illustrate whether the problem was one-time (and therefore inconsequential in terms of the overall budget) or chronic (which means your 1965 Chevy finally needs to be junked).

All prompts in *Family Finances* work cleanly and quickly, and the required information always appears within half a minute. While two disk drives will decrease work time, the package performs reasonably well with one. Messages such as "I'm doing it now!" inform you of progress. Those owning a printer can obtain hard copies of their financial reports. *Family Finances* performs its functions admirably, but it will only be helpful to those who already know something about home budgeting.

HOME INVENTORY

Company: APX
Language: Atari BASIC and Machine
Hardware Requirements: 32K

Department: Business
Sugg. Retail: $24.95
Availability: 7
Disk or Tape: Disk

OVERALL RATING	B	DOCUMENTATION	A-	RELIABILITY	B
EASE OF USE	B	VALUE FOR MONEY	B+	ERROR HANDLING	B+
VENDOR SUPPORT	B	VISUAL APPEAL	B		

Home Inventory by RLM Micro Systems is distributed and marketed by the Atari Program Exchange. The program provides an organized way of recording personal property to aid in protection against loss by theft or disaster. It could also aid in determining insurance needs or be used to judge the value of an estate. The straightforward documentation provides numerous illustrations on program use, and little or no computer literacy is required to run the program. You may enter an item by name, description, three letter category (e.g., COM for computer equipment), serial number, date of purchase, and value. A permanent record can be made of up to 1,200 items per data disk, with no limit on the number of data disks. Complete or partial lists may be printed on a printer.

Adding to or deleting items is simple. Just select whether you want to add data or retrieve data (for updating). The

inventory list may also be printed to the screen, and there is a search and sort routine (in Machine language) for finding selected items. At the end of the printed report, a total for the number of records and dollar amount is printed.

The program is simple to use, though there are three things which could have made this program better. First, the program is non-DOS compatible and copy protected, so there is no way to back it up. If your house and computer go up in smoke, you will need to obtain another computer and program disk just to retrieve data from the data disk you sequestered in a safe storage spot. Second, it would have been helpful to have the program calculate a depreciation schedule and/or replacement cost schedule for each item. Third, the Atari numerical keypad is not enabled by the program, making it tedious to enter all those dates, values, and serial numbers with the computer keyboard.

On the whole, however, *Home Inventory* is a good program at a reasonable price. Just be sure to keep your program and data in a safe place (bank safe deposit box or with a friend), and back up your data regularly.

MAGIC MAIL
Company: A Bit-Better Software
Language: Machine
Hardware Requirements: 16K

Department: Business
Sugg. Retail: $59.95
Availability: 3
Disk or Tape: Disk

OVERALL RATING	B−	DOCUMENTATION	B	RELIABILITY	B
EASE OF USE	B+	VALUE FOR MONEY	C+	ERROR HANDLING	B
VENDOR SUPPORT	C−	VISUAL APPEAL	C		

Magic Mail is a Machine language mail list program that is fast and easy to use. On-screen menus and commands present some interesting peculiarities. Information like state, zip, and phone number are length dependent, so when you finish one, the cursor automatically jumps to the next, which makes entering zipcodes, phone numbers, and birthdays fast. With an easy form like this, you can easily enter all 400 of your friends, family, and business associates.

Now that you have your file, what can *Magic Mail* do with it? Well, you can "find" a particular entry, or "modify" it. You can print any selected entry or combination of entries, or print mailing labels. You can have more than one database on a disk, so you could create separate files for family, friends, customers, suppliers, or so on.

One of the main functions of a mail list program is its ability to sort your file (usually on the Name field). This brings up one of those peculiarities I mentioned earlier. *Magic Mail* sorts on the beginning of the Name field, so if you've listed your entries with first name first, that's how it will be sorted. You'll have Bob Smith before Ted Adams. If you list your names last name first, you'll get a conventional alphabetical listing, but the labels will be printed as Smith, Bob.

The sort function is memory dependent. The number of entries you can sort breaks down as:

16K	58
24K	153
32K	248
40K	343
48K	439

If you're planning on using *Magic Mail* for business purposes, 439 entries may not be enough. You'd need to break up your file into two or more databases, such as Customers A-J and Customers K-Z. The Sort and Find features are both extremely fast thanks to the Machine language programming.

One of the more unique features of *Magic Mail* is its ability to dial a telephone number for you by simulating the tones the phone company uses for Touch Tone service. After retrieving the desired file you simply hit "D" on the keyboard while holding the phone's mouthpiece next to the TV speaker. This feature won't work if you have Dial Pulse lines. And here is a related oversight in the program—*Magic Mail* will not dial "1" and then your long distance number. This brings up another point. When you're filling in the data form for someone in your area, you must leave the area code blank if you want to use the auto-dial feature.

There are a couple of things I would like to see in *Magic Mail* that, given its price, could be included. One would be a "Memo" line for little notes such as "good customer" or "never pays on time." Another would be the ability to have two phone numbers for each file so both business and home phone numbers could be included.

One final note. There was a mention in the computer press of a bug in *Magic Mail*'s sort routine. I couldn't find it, but you might want to contact A Bit-Better Software before purchasing *Magic Mail* to make sure you get the debugged version.

HOME LOAN ANALYSIS

Company: APX
Language: BASIC
Hardware Requirements: 16K cassette, 24K disk

Department: Business
Sugg. Retail: $24.95
Availability: 9
Disk or Tape: Both

OVERALL RATING	A	DOCUMENTATION	B+	RELIABILITY	A
EASE OF USE	B+	VALUE FOR MONEY	A	ERROR HANDLING	A
VENDOR SUPPORT	A	VISUAL APPEAL	B+		

Home Loan Analysis, written by Jim Skinner and distributed by APX, is an excellent program that lets you examine and evaluate loan alternatives for a home, auto, or nearly any other installment loan. The program has five main functions: (1) calculate a monthly payment (excluding taxes and insurance); (2) calculate maximum purchase price a buyer can afford; (3) calculate an appreciation rate; (4) calculate a resale value; and (5) produce an amortization schedule. You can view the results on screen or output to your printer. To use the program properly, you should know the interest rate, original purchase price, down payment, balloon payment, and the number of years you will borrow the money. You can change each variable and observe the effect on the loan.

Once you have loaded the program into memory, you see the Main Menu. The author has provided a sample home loan for you to play with, or you can start typing in information from your own loan. The top portion shows the loan data and the lower portion, projected values. You make your selections by moving the arrow up using the Option key, or down using the Select key. Pressing the Start key begins calculations. The excellent manual thoroughly explains each variable. If you want to find the maximum price you can afford for a house, move the arrow to "Monthly Payment" and type in the amount. Moving the arrow to "Purchase Price" and pressing Start yields the maximum amount you can afford to pay based on set figures for the other variables. You can change any variable to see the effect on your loan, an important one being the interest rate. Placing the arrow on "Calculate Amortization Schedule" yields a display of an amortization table for any chosen year, showing Month, Principal Paid, Interest Paid, and Loan Balance. It also shows total interest and principal paid to date. The lower portion of the Main Menu helps you calculate appreciation of your home. By changing the appreciation rate and moving the arrow to "Resale Value" you can see the effect of inflation on your property.

Home Loan Analysis continues the APX standard of offering worthwhile programs for a fair price. I highly recommend it.

MMG DATA MANAGER

Company: MMG Micro Software
Language: BASIC & Machine
Hardware Requirements: 32K

Department: Business
Sugg. Retail: $49.95
Availability: 4
Disk or Tape: Disk

OVERALL RATING	B-	DOCUMENTATION	C	RELIABILITY	A
EASE OF USE	B	VALUE FOR MONEY	B	ERROR HANDLING	B-
VENDOR SUPPORT	C	VISUAL APPEAL	B		

MMG Data Manager, a small database management program with limited features, best suits the storage and retrieval of short records (up to ten fields) such as telephone and address directories, home inventories, and mailing lists. You can print a summary report for records retrieved by searching the database, which occupies one disk. The program can use two disk drives and probably should to avoid frequent swapping of program and data disks.

The program is completely menu-driven and features a colorful Main Menu. The menus work smoothly, and easy-to-follow prompts direct you through the procedure of setting up a database. Although the manual does not specify the maximum length of a record, each record holds only ten fields. Prompts tell you to enter headings and field length one at a time on the screen. I found the absence of a cursor during data entry annoying, because if I looked away from the screen I lost my place. Another problem is that you cannot change any of the information after creating the data dictionary for the database. If you have pressed Return when entering data, you must begin all over again to correct a mistake in the field data. Because of the small size of each record, you must carefully plan each field. The documentation recommends that you define the database characteristics on paper before entering them into the program. You should enter only a few test records first and experiment with the format before you type in a

large number of records. When you enter data into a record, the fields appear one at a time in the order entered.

Records are stored on the disk as you enter them. Later you can sort them in ascending or descending order, sorting all fields simultaneously. A five character "key" remains in memory for each of the ten fields allowed. The access time for any record is short, typically less than one second. The disk files are accessible using Atari DOS.

The program provides a simple list format for printing results. A special print format allows you considerable freedom in formatting the printed output. You can select the items in any order and have them printed beside the previous item or on the next line. The format includes a twenty-character application name and date. The maximum width is 130 columns. The technique used to obtain condensed print on the Atari 825 printer as described in the manual did not work. In general, however, I found the manual very easy to follow.

PERSONAL FINANCE SYSTEM

Company: Dynacomp
Language: BASIC
Hardware Requirements: 24K

Department: Business
Department: $34.95 disk/$12.95 cassette
Availability: 4
Disk or Tape: Both

OVERALL RATING	**B**	DOCUMENTATION	**C**	RELIABILITY	**B**
EASE OF USE	**B+**	VALUE FOR MONEY	**B**	ERROR HANDLING	**N/A**
VENDOR SUPPORT	**B+**	VISUAL APPEAL	**C**		

A user-friendly program, *Personal Finance System* maintains, corrects, sorts, and displays your personal financial records. Dynacomp suggests that you first make a back-up copy of your program disk for everyday use. Once you have done that, you are ready to start your data file. This menu-driven program offers a number of choices, then guides you through the process of entering data. One file holds a minimum of 300 transactions (with a single drive) to a maximum of more than 800 (with two drives). Depending on your financial activity, one file can hold data from a month's transactions up to a year's.

Personal Finance System contains nine important functions. "Create" helps you start a new data file, to which you make additions using "Addata." The program prompts you for input on each record and numbers each transaction. I would have preferred an option to number the records myself, but this is a minor point. You next enter the date, the amount of the transaction, the entry's tax status (for later retrieval if deductible), and the transaction code (for cash, deposit, monthly bank charges, or deletion). Hitting the Return without a code means the transaction was a check. The next prompt asks you for a user code. These you choose yourself from the letters of the alphabet, such as "L" for all loan payments. The final entry, payee, must not exceed seventeen characters. At this point you verify that the record is correct and change any errors. I would have liked to have one more field for comments, but that would take space in the memory from records.

To go back and correct files or change fields, you can use the Fixit option. When you back up a file using the Utility option, you can delete records by placing "X" as the transaction code. When using the Utility function, you back up and then restore the original file to create more space for new entries. The checkbook balancing function (Balance) works the same as most bank statements. You enter a starting balance, standard credits, and debits. You can add check fees as a lump sum or alter the program code to deduct a set amount for each check. The Select option lets you see or print records, but only expenses—it will not list deposits, monthly charges, or cash payments. You can call up all tax deductible expenses or payments under a specific user code, or payments to one payee. Asking for a monthly summary of expenses creates a separate data file called Barmon.dat, which plays a role in the Mongraph option. This function displays a Monthly Expenses bar graph based on an entire year's data.

The final options let you evaluate expenses by payee. The Sortpaye option creates a data file sorted alphabetically by payee. The Sumpaye option reads this file and summarizes expenses for each payee. All of the options allow output to either the screen or a printer.

Personal Finance System helps you through each step. As its name implies, it best suits personal bookkeeping. The manual, much neglected by software companies in general including this one, consists of small type on cheap paper. I liked the appendix, which lists changes you can make to the program code to automatically add check fees, or expand the program to a two drive system. I found this program valuable and moderately priced, particularly when considering Dynacomp's excellent customer support.

THE MONEY PROCESSOR

Company: Luck Software
Language: Assemlbly
Hardware Requirements: 48K

Department: Business
Sugg. Retail: $80.00
Availability: 3
Disk or Tape: Disk*

OVERALL RATING	B+	DOCUMENTATION	B+	RELIABILITY	A
EASE OF USE	B+	VALUE FOR MONEY	A−	ERROR HANDLING	B
VENDOR SUPPORT	A	VISUAL APPEAL	A		

The Money Processor, a spreadsheet program, comes with two copy-protected program disks and a specially formatted Master data disk. You can use up to 255 data disks, which you can back up if you wish. A printer lets you obtain a hard copy record. You can specify disk drives from one to four. Although designed for the Atari 800, the program works with the 1200XL nicely. It best suits a home computer user, not businesses. The accounts menu includes seven categories: Credit Cards, Checking Accounts, Savings Accounts, Cash, Employee Expense, Tax Return Items, and Budget Items. Totals in brackets represent money you owe, and totals without brackets represent money that you already possess or that someone owes you. You can define subcategories to fit your own finances. For example, if you have three checking accounts, you can list them separately because *The Money Processor* keeps track of debits and credits for each account.

You enter all expenses as they occur, and enter and verify statements when they arrive from the bank or a creditor. The Search feature tracks down a word or phrase, helpful in case you've forgotten the date or amount of a check. There is a free-space window which keeps you informed of data storage and tells you when to add another data disk. Also, a scrolling "moving window" permits entry of up to forty characters to describe a particular transaction on the same line as the date and dollar entries. Unfortunately, the program does not support the Atari CX85 keypad.

The well-organized and well-illustrated documentation consists of an Operation Guide and an Owner's Manual. Although rather wordy, they enable even the computer novice to run the program. Error handling seems adequate, although you should watch out for unwanted duplication while verifying statements. At any rate, the author does invite written inquiries about problems that arise. I consider *The Money Processor* a worthwhile investment for people who have trouble keeping track of their money—the program helps you monitor your financial position on a day-to-day basis.

SPELL WIZARD

Company: DataSoft
Language: Machine
Hardware Requirements: 32K

Department: Business
Sugg. Retail: $49.95
Availability: 7
Disk or Tape: Disk*

OVERALL RATING	B	DOCUMENTATION	B	RELIABILITY	B
EASE OF USE	B	VALUE FOR MONEY	B−	ERROR HANDLING	B
VENDOR SUPPORT	B	VISUAL APPEAL	B		

The easily used *Spell Wizard* checks spelling on any word processor that saves output as standard DOS text files. Of the word processors that I checked, only *Letter Perfect* would not work with the program. *Spell Wizard* lets you simultaneously find and correct misspelled words by scanning the text file and locating the unique words. The program then compares these words to the more than 33,000 words in the dictionary stored on a separate disk, plus any words you inserted in a separate dictionary. The text file is reloaded into memory, and displaying three lines at a time, pauses at misspelled words and words not in the dictionaries. The words are highlighted in inverse; you decide whether to correct them or go on. You can either look up the word in a dictionary, or search for it on the dictionary disk. People with two drives will find this handy, but those with one drive have to swap disks each time they look up a word. You can search using a wildcard feature by typing part of the word followed by an asterisk. You see only five words at a time, but can pause by pressing the Space bar. You correct words one at a time and save the entire file when corrections are finished.

The biggest constraint is the limit of 1,000 unique words per text file. If you pass this limit, you must split your file in order to use the program. Another problem is the dictionary. It tends to favor long words over short ones, which helps only if you know how to spell already. Since I don't, I suspect that many of the words not in the dictionary are

misspelled and have to look them up to make sure. Of course, you can build an auxiliary dictionary of words commonly used in your writing. You can't delete words, but the documentation implies that your word processor can do this for you. The program does alphabetize the words for you. You can also print out your custom dictionary if you want to keep a record of it. Although the dictionary is not the best I have seen, the number of words stored in one Atari 128-byte sector amazed me. They averaged forty-five words of six to seven letters each. The data compression method is excellent.

Spell Wizard efficiently scans your text files at a rate of 600 words per minute. It may take between two and seven minutes to scan the dictionary disk, depending on the number of unique words. Menu-driven, the program is easy to use and quite helpful to people who write a great deal but need professional-looking manuscripts free of spelling errors.

STRATEGIC FINANCIAL RATIO ANALYSIS

Company: APX
Language: BASIC
Hardware Requirements: 32K

Department: Business
Sugg. Retail: $34.95
Availability: 8
Disk or Tape: Disk

OVERALL RATING	B+	DOCUMENTATION	A	RELIABILITY	A
EASE OF USE	A	VALUE FOR MONEY	B−	ERROR HANDLING	A
VENDOR SUPPORT	C	VISUAL APPEAL	A		

A highly sophisticated program, *Strategic Financial Ratio Analysis* helps you seriously evaluate your firm's performance and management strategies. You supply a number of values, usually obtained from published financial statements. The program contains a data set editor (which permits compilation and modification of financial data for two different companies or for one company at two different times), a sequential data input (a faster version of the preceding), a strategic ratio computation (which computes fifteen ratios and displays them in a special format), a miscellaneous ratio computation (which computes an additional fifteen common ratios), and a glossary and disk directory (which display definitions of the ratios and assist in the management of data).

The disk comes with two sample data sets to help you learn the program, and a well-documented and well-written manual. The presentation and graphics are good. The program responds quickly and is free of errors. I would advise watching this program in action before buying it just to make sure that it does what you expect.

EDUCATION

ADDITION AND SUBTRACTION

Company: Edupro
Language: BASIC
Hardware Requirements: 16K cassette; 24K disk

Department: Education
Sugg. Retail: $24.95
Availability: 6
Disk or Tape: Both

OVERALL RATING	B	EASE OF USE	B	ERROR HANDLING	B–
EDUCATIONAL VALUE	B+	DOCUMENTATION	C+	RELIABILITY	B
VENDOR SUPPORT	B+	VISUAL APPEAL	D–	VALUE FOR MONEY	B

Addition and Subtraction is an education program for kids five to nine. While the single player game is the most popular, it can accommodate up to four players, and is made up of four separate games. The first, "One, Two, Three, Four, Five," is a fill-in game which teaches addition and subtraction using numbers from 0 to 10. The second, "One, Two, Buckle My Shoe," teaches addition and subtraction with numbers as large as twenty (in the easy level) to forty (in the difficult level).

The third game, "Going to See Big Ben," is a race game which reinforces basic mathematical skills. The last game, "Count By," is a maze game which teaches kids to count in increments of 2, 3, 4, or 5. *Addition and Subtraction* is a good drill program which fulfills its primary objective of educating young children. Don't buy the program if you're looking for something with strong graphics; this program doesn't have it. But it does do a nice job of teaching the basics of arithmetic.

CAREER COUNSELOR

Company: MMG Micro Software
Language: Atari BASIC
Hardware Requirements: 32K

Department: Education
Sugg. Retail: $59.95
Availability: 7
Disk or Tape: Disk*

OVERALL RATING	B–	EASE OF USE	A–	ERROR HANDLING	A
EDUCATIONAL VALUE	C+	DOCUMENTATION	B	RELIABILITY	B
VENDOR SUPPORT	B	VISUAL APPEAL	B	VALUE FOR MONEY	B–

Career Counselor helps students explore career choices. The Main Menu gives you two options, Career Search and Career Dictionary. To begin narrowing the list of possible careers, choose Career Search. The Search Menu contains Interests, Aptitudes, Educational Level, Physical Demand, Variation of Task, Independence, Creativity, Leadership, Career Category, Earnings Range, and Employment Outlook. Each option includes a list of related choices. For example, Interests offers four items for consideration—data, people, things, plants and animals. You register a preference for each, thus lowering the number of career choices from the original 337. Once you have responded to each of the options, the computer uses your choices as search criteria. At any time, you can invoke the last option, List Careers, to find the careers matching your stated abilities, goals, and preferences. If you have this information printed out, you also receive a list of your responses to the items in Career Search.

Career Directory lets you examine each of the computer-selected careers in detail. You get the D.O.T. number, the current earnings level, and the employment outlook for each career. Supply and demand obviously influence the last two, so the program should be updated periodically. Otherwise, I don't think people involved in career counseling would find the program useful for very long.

The program works fine with single Percom drives and with Atari 810 drives, but it locked up the Atari keyboard when used with a dual Percom disk drive. Except for these weaknesses and the problem with updating mentioned above, I thought the program well done and informative.

ESCAPE TO EQUATUS

Company: APX
Language: BASIC
Hardware Requirements: 24K

Department: Education
Sugg. Retail: $24.95
Availability: 9
Disk or Tape: Both

OVERALL RATING	A–	EASE OF USE	A–	ERROR HANDLING	A–
EDUCATIONAL VALUE	B+	DOCUMENTATION	A	RELIABILITY	A
VENDOR SUPPORT	B	VISUAL APPEAL	B	VALUE FOR MONEY	A–

Escape to Equatus combines the fun of an arcade "shoot-'em-up" game with simple arithmetic problems. Children will enjoy this cleverly-designed math game because of its effective use of sound effects and graphics. Even the documentation sounds like the description of a video game: "Many light years ago in a distant galaxy, the planet Mathema collided with a meteor. The planet was completely destroyed, but moments before the end, a small band of Mathemen escaped aboard the giant robot ship Metrica." At the beginning of the game, the Metrica lands in a crater on the moon Equatus, leaving the Mathemen and a Solutus fighter behind (two fighters wait in reserve). Meanwhile, an Equacian battle cruiser trailing an arithmetic problem appears on the screen. Underneath the problem drifts a "lethal number line" which slowly descends toward the bottom of the crater. Using a joystick, you maneuver your Solutus fighter beneath the correct digit in the number line, press the firing button, and shoot the digit with a laser. If you choose the correct answer to the problem, you score points. You also face another cruiser soaring overhead with another math problem. If your answer is wrong, the number line continues to descend. You can erase the number for your answer by pulling the joystick forward. If you wait too long to shoot the correct number, your ship is destroyed and several of the Mathemen dematerialize to reappear in an "underground cavern." After you have destroyed all three ships, a cruiser will appear trailing the missed problems. Again, you have the opportunity to shoot the correct answer. If you succeed, the immobilized Mathemen return to the crater and the game proceeds.

The game has four levels of skill. The easiest level contains simple addition and subtraction of numbers from one through five. The most difficult level contains addition, subtraction, multiplication, and division of numbers from six to twenty-four. The speed of the number line's descent increases with each level.

The graphics are well drawn and colorful. The only minor weaknesses are the jerky movements of the Solutus fighters and the number line, which could frustrate small children playing the game. In spite of this, *Escape to Equatus* is an ideal game for children in the primary grades. They can enjoy playing a game while drilling with basic math facts.

FINGERSPELLING

Company: APX
Language: BASIC
Hardware Requirements: 16K tape, 24K disk

Department: Education
Sugg. Retail: $24.95
Availability: 8
Disk or Tape: Both

OVERALL RATING	B	EASE OF USE	A–	ERROR HANDLING	N/A
EDUCATIONAL VALUE	B–	DOCUMENTATION	B	RELIABILITY	A
VENDOR SUPPORT	C	VISUAL APPEAL	B	VALUE FOR MONEY	B

Fingerspelling teaches the sign language deaf people use to spell out words, usually difficult words that have no signed equivalent (signing employs the hands, arms, and body to communicate words, phrases, and ideas; it is the common form of communication among deaf people). Fingerspelling is rarely used because of its slowness, but skin divers and others use it. If you want to learn to communicate with deaf people, you should learn signing instead. Given the limited use of fingerspelling, this program teaches it well. It is easy to use and visually appealing.

The program works in two modes: Show Me and Test Me. In the first, you type in a letter or word and the screen displays a well-drawn hand forming the correct letter. You can adjust the speed over a range of nine levels, each represented by an animal (from snail to cheetah). The steps are well graduated, also, the first few levels speeding up only as you gain proficiency. In the second mode, the computer tests you on letters or words. You can stop the test at any time to check the results, but this automatically resets the tally so that you cannot carry over your score. Another minor annoyance is the horrible rendition of the alphabet song that starts as soon as you boot the program. A hand forms the letters as the song proceeds. You cannot start working until the song has ended. A child might not mind this as much as I did, but I found it a distinct flaw in an otherwise well-done package.

FRACTION FACTORY

Company: Counterpoint Software, Inc.
Language: BASIC
Hardware Requirements: 48K

Department: Education
Sugg. Retail: $29.95
Availability: 3
Disk or Tape: Both

OVERALL RATING	**B+**	EASE OF USE	**B**	ERROR HANDLING	**A**
EDUCATIONAL VALUE	**B+**	DOCUMENTATION	**B-**	RELIABILITY	**A**
VENDOR SUPPORT	**B-**	VISUAL APPEAL	**B+**	VALUE FOR MONEY	**B+**

Fraction Factory, an educational program for children in the third through sixth grades, teaches fractions with a pleasant mix of sound, color, and animation. The program itself has five major categories: adding fractions, subtracting fractions, fractions of a number, equivalent fractions (finding fractions which are equal but have different denominators), and fractions and sets (finding the percent of objects contained within a box as compared to the total number of objects on the screen). A simple yet pleasant animation sequence lists the correct answers after each learning area is completed.

The program loads itself and is simple to use. The manual includes instructions for several computers, so it takes a few extra minutes to be sure of the prompts in the Atari version. The program overall is interesting, pleasant to the eye, and aids in the teaching of fractions.

GEOGRAPHY

Company: Atari Program Exchange
Language: BASIC
Hardware Requirements: 16K

Department: Education
Sugg. Retail: $29.95
Availability: 9
Disk or Tape: Disk

OVERALL RATING	**A**	EASE OF USE	**A**	ERROR HANDLING	**A-**
EDUCATIONAL VALUE	**A**	DOCUMENTATION	**A**	RELIABILITY	**A**
VENDOR SUPPORT	**C**	VISUAL APPEAL	**B**	VALUE FOR MONEY	**A**

Memorization of the capitals of countries and states can be boring and tedious, but *Geography* makes it enjoyable. This comprehensive world geography program for grades four through ten includes drill and practice programs divided into four sections.

A) States—Geographic representations of a particular region of the United States appear on the screen with the state in question identified by an x. The student chooses the region as well as the number of questions. This section is for grades five through eight.

B) Capitals—The fourth through eighth grade student can request the state and identify the capital or vice versa or both. He may select a region or the entire United States.

C) Continents—Given the name of a country, the student must decide on which continent it is located. A list of continents appears on the screen with a number beside them. Enter the number of the continent to tell where the country is located. This section is appropriate for the fourth through eighth grade student.

D) Countries—Drill and practice is given on the capitals of the nations of the world. A choice is given as to working with capitals from any country or those from a specific geographic location. If the student answers incorrectly the first time, a hint is given relating the first letter of the capital. This section is appropriate for the seventh through tenth grader.

All four sections provide two chances to answer correctly before the computer produces the correct answer. Only the first two sections include geographic representations. A suggestion would be to include maps in the other two sections for reinforcement purposes. Also, the practice section on continents should require spelling of the continent as well. All four sections allow the student to choose the number of problems he desires to do. The scores are tallied at the end of each section. Just as with other APX programs, the documentation is well-done. Support materials, including handouts, suggestions for other activities related to the geography sections, and sample runs of the lessons provide a thorough package well worth the price.

GTIA GRAPHICS:
TRICKY TUTORIAL #9
Company: Educational Software
Language: BASIC
Hardware Requirements: 32K

Department: Education
Sugg. Retail: $29.95
Availability: 4
Disk or Tape: Both

OVERALL RATING	**C**	EASE OF USE	**B**	ERROR HANDLING	**B**
EDUCATIONAL VALUE	**C−**	DOCUMENTATION	**B−**	RELIABILITY	**B**
VENDOR SUPPORT	**B**	VISUAL APPEAL	**B**	VALUE FOR MONEY	**C−**

GTIA Graphics makes the ninth in a series of tutorials from Educational Software which vary widely in educational quality. Unfortunately, this is one of the weaker programs. It covers the three extra graphics modes available in computers with the GTIA graphics chip. These three modes allow first, sixteen different luminances in one hue, second, sixteen different hues with one luminance, and third, nine different hues with one luminance. The first two do not take advantage of Atari's indirect color register; instead, the color is bit-mapped on the screen. You use these modes mainly to create detailed pictures with heavy shading, or very colorful pictures.

The package also includes a drawing program for GTIA Mode 10, the nine-color mode. It allows you to plot colored, elongated GTIA pixels on the screen using a joystick-controlled cursor. You can save finished drawings to disk. The accompanying booklet helps only if you have not read up on the subject; if you have, the program in toto merely shows the potential of the graphics modes.

LANGUAGE LAB DRILL KIT II
Company: Bluestone Software
Language: BASIC
Hardware Requirements: 16K

Department: Education
Sugg. Retail: $19.95
Availability: 2
Disk or Tape: Both

OVERALL RATING	**D+**	EASE OF USE	**B**	ERROR HANDLING	**D**
EDUCATIONAL VALUE	**C−**	DOCUMENTATION	**A**	RELIABILITY	**D**
VENDOR SUPPORT	**C−**	VISUAL APPEAL	**D**	VALUE FOR MONEY	**D**

One word describes Bluestone Software's *Language Lab Drill Kit II*—mediocre. You can use the program (geared for grades four through eight) as a follow-up learning station, for group instruction, for an older student to teach a younger student, or at home. It proves practical only as a visual aid in the classroom. If you want to use it this way, you should adapt it to fit your regular grammar instruction.

The program drills students on sentence types, punctuation, subjects and predicates, sentence fragments, verb tenses, topic sentences, outlines, finding information, and card catalogs. Unfortunately, definitions of grammar terms are not always clear. Each drill contains twenty exercises. Following each response, sounds indicate whether the student has answered the question correctly. The answer appears again so that the student can study it. Some of the questions have more than one correct answer, but only one is counted correct. Others ask for a correction when none is necessary.

A scoreboard above each exercise lists the student's name, the number of problems, the number of problems answered correctly, and the percentage of correct answers. After the student has completed the exercise, the computer suggests more practice or congratulates the student on a job well done. At this point, the computer prompts the student to type "R" to repeat that section, "M" for menu, and "E" for end. On random occasions, typing "R" brought an error message. If the student has no experience with BASIC programming, they will have to ask you for help. Graphics are nonexistent. Background colors vary somewhat. The documentation is well written, concise, and easy to follow. I found it the only good part of the program.

MARATHON

Company: Educational Software
Language: BASIC
Hardware Requirements: 16K cassette, 24K disk

Department: Education
Sugg. Retail: $20.00
Availability: 4
Disk or Tape: Both

OVERALL RATING	D+	EASE OF USE	B-	ERROR HANDLING	B
EDUCATIONAL VALUE	C-	DOCUMENTATION	C-	RELIABILITY	B
VENDOR SUPPORT	B	VISUAL APPEAL	D	VALUE FOR MONEY	D

Marathon, a math quiz game, pits two people against each other in a race run by answering math questions correctly. (You can also play against the computer.) Questions cover multiplication, division, addition, and subtraction. The race offers four levels of difficulty, giving you less time to answer each question as you move from walker to jogger, sprinter, and Olympian. You begin with twelve seconds as a walker and end with two seconds as an Olympian. Every fifth question you must select multiples of the number presented. You use a joystick to indicate the correct answers, choosing from a grid of ten choices. The graphics are primitive, and the game concept simple. Unless you and your opponent are evenly matched, the less skilled player will become frustrated. At the end of the game, you must reenter the choice of game, number of players, and level of play—a tedious process. Better math quiz games exist.

MATH MISSION 1.0

Company: APX
Language: BASIC
Hardware Requirements: 16K tape, 24K disc

Department: Education
Sugg. Retail: $24.95
Availability: 8
Disk or Tape: Both

OVERALL RATING	B+	EASE OF USE	B	ERROR HANDLING	B-
EDUCATIONAL VALUE	B	DOCUMENTATION	B	RELIABILITY	A
VENDOR SUPPORT	C	VISUAL APPEAL	B+	VALUE FOR MONEY	B

Math Mission, a drill and practice program for basic arithmetic skills, lets you practice one or more math skills at once using integers only, no fractions or decimals. *Math Mission* takes the form of a game, in this case a rather primitive one. You get a rocket ship graphic, a fuel indicator, and scrolling terrain. At the top of the screen is the current problem and the score bar. You must answer the questions correctly to keep your ship in flight. Wrong or slow answers cause you to lose fuel, while correct answers win added fuel. When you lose all of the fuel, the ship crashes and the game ends. If you keep the ship flying for a set time, you win bonus points, a complete refueling, and a new planet to conquer. Along the way you can win special bonuses for an unbroken string of correct answers or just for getting many problems right. Each planet lasts about thirty seconds, and you face several levels of difficulty which affect how quickly your ship burns fuel. The beginning problems are easy, with small numbers, but the numbers increase gradually with each new planet. As far as I could tell, there is no limit to the increase. You can continue to play until you run out of fuel or get tired and quit.

The graphics are adequate, if not tremendous. The scrolling terrain varies within narrow limits from planet to planet, and uses a redefined character set. Most of the time you focus on the problems at the top of the screen, anyway. The sound effects are well done, with a roar for the ship in flight and various bleeps, blips, and buzzes for right and wrong answers and bonuses. Cycling of the color register, a mark of many Atari games, also signals bonuses. The noise would probably create a distraction in a classroom.

You can play the game with a joystick or keyboard, although the joystick is too slow for the higher levels. Anyone at all comfortable with a keyboard will probably prefer to use it. The worst problem is that you cannot correct a mistake. You cannot backspace, and must complete an answer that you know is wrong and take the penalty before you can enter the correct answer. Moreover, you cannot bypass the early stages to move directly to the harder problems. You may also have problems with two-digit numbers because the format is horizontal rather than vertical.

Math Mission does make drilling on math skills more interesting than the boring traditional approach, particularly for students who prefer video games.

MUSIC MAJOR

Company: Educational Software
Language: BASIC
Hardware Requirements: 32K

Department: Education
Sugg. Retail: $39.95
Availability: 7
Disk or Tape: Disk

OVERALL RATING	A	EASE OF USE	A	ERROR HANDLING	A
EDUCATIONAL VALUE	A	DOCUMENTATION	A	RELIABILITY	A
VENDOR SUPPORT	B	VISUAL APPEAL	A	VALUE FOR MONEY	A

"Learn the basics of music with this lighthearted but very thorough approach," claim the authors of *Music Major*. Lighthearted it may be, but this program requires persistence and patience as well. The beginning music student must use the documentation as a guide, and would be well advised to use it in conjunction with an introductory theory class and music lessons. The program teaches music theory and recognition of piano keys, notes, counting notes, counting measures, and key signatures. While doing so, it makes effective use of the Atari's impressive visual and sound effects. For example, when a happy face appears on a key of the displayed piano keyboard, pressing the corresponding key on the computer keyboard generates the sound of that note. You learn how to read a time signature and name the major and minor key signatures as well.

The program includes two other options worth noting, the Teaching Mode and the Quiz Program. Pressing the Option and Return keys moves you to Teaching Mode, used in the exercises. Let's say you want to find C sharp on the displayed keyboard. When you enter "C" and "S" and press Return, a happy face appears on the C sharp key. To use the Quiz Program, you must create data statements to drive the Quiz Master Utility. The documentation tells you how to do this, but you do need some knowledge of BASIC. It is not as easy as it sounds. You can create your own quizzes once you have mastered the technique, or depend upon the questions asked throughout the presentation of Beethoven's life. I liked the inclusion of the first few measures of his Fifth Symphony. All in all, I thought the lessons flowed smoothly from simple to complex and suited an age range from six years through adult. Music students and teachers will welcome the reinforcement of musical concepts that this program offers.

NUMBER RELATIONSHIPS

Company: Edupro
Language: BASIC
Hardware Requirements: 16K cassette; 24K disk

Department: Education
Sugg. Retail: $24.95
Availability: 7
Disk or Tape: Both

OVERALL RATING	B	EASE OF USE	B−	ERROR HANDLING	B
EDUCATIONAL VALUE	B+	DOCUMENTATION	B−	RELIABILITY	B
VENDOR SUPPORT	B+	VISUAL APPEAL	D−	VALUE FOR MONEY	B

Number Relationships is an education package for kids five to nine years old. It can accommodate from one to four players. The first game, "There Was An Old Woman," teaches children the concepts of less-than, equal-to, and greater-than. Kids can choose to work with either integers or fractions, selecting either a short or long version of the game.

The second game, "Numbers and Numerals," teaches children to associate a number such as "three" with its corresponding numeral, "3." The program randomly selects a range of numbers and challenges either a single player or a group to race against time and correlate numbers and numerals. The third game, "Shapes and Stars," challenges students to count asterisks in determining whether a group of stars is greater-than, equal-to, or less-than another group of stars.

Numeric Relationships accomplishes its primary objective of teaching the basics of arithmetic to young children. An individual child can use the program to learn mathematical concepts, while a group of kids will be delighted by the competitive aspect of the program. As with most products from Edupro, *Number Relationships* is light in its use of the sound and graphics capabilities of the Atari system. Aside from a plain vanilla Graphics Mode 2 title screen, the entire program unfolds in Graphics Mode 0. There is a problem with the contrast setting; it is difficult to distinguish a 0 from a 6. You can correct the problem by changing the 14 to a 10 in line number 2690 of each of the games.

Overall, the program is a winner. It brings a rare quality to the educational marketplace: education. If you're looking for an upbeat vehicle to reinfore your kids' mathematical prowess, then *Number Relationships* is for you.

MICKEY IN THE GREAT OUTDOORS

Company: Atari, Inc.
Language: Machine
Hardware Requirements: 16K

Department: Education
Sugg. Retail: $39.95
Availability: 8
Disk or Tape: Tape

OVERALL RATING	**B+**	EASE OF USE	**B−**	ERROR HANDLING	**B−**
EDUCATIONAL VALUE	**B−**	DOCUMENTATION	**C+**	RELIABILITY	**B**
VENDOR SUPPORT	**C−**	VISUAL APPEAL	**A**	VALUE FOR MONEY	**A−**

Walt Disney Productions designed *Mickey in the Great Outdoors* exclusively for Atari for the seven to ten year old age group. You guide Mickey through two adventures, each containing two educational games. On the first side of the cassette, Mickey goes hiking. You learn sentence structure. You aim Mickey's arrow to shoot at the correct word to complete a five-word sentence bridge, so that Mickey can cross the stream. I liked the realistic cartoon graphics, but the limited joystick control of Mickey's movements disappointed me. He does speed up to cope with a speedy turtle and speedier clouds containing the missing words. You play for sixty-four sentences, or until the computer completes three. Your adventure continues in Mickey's magic garden, where Mickey needs your help to unscramble a four-letter word. You must listen carefully to the simple tones for correct placement, incorrect placement, and letter pick-up. Also, you use each letter only once while unscrambling the word. You win points according to the time it takes to spell the word correctly. The game has little action, and ends after ten words or after the computer unscrambles three words.

On the second side of the cassette, you help Mickey explore the world of numbers. First you help him catch butterflies to correctly complete an equation involving addition, subtraction, multiplication, and division, and the relationships among them. Next, you help Mickey complete sequences of numbers. The arcade response format makes this game exciting. As a frog jumps over lilypads representing the possible answers, Mickey paddles his canoe overhead. When the frog lands on the right answer, Mickey must lower his paddle to cover the poor frog. As you improve, the lilypads begin to float back and forth.

I would like to see a warranty with this package, but mine worked with no problem. Otherwise, the only element missing is adaptability. You can't add sentences or words, or modify the program in any way to offer more challenge as you improve.

PICTURE-PLAY

Company: Edupro
Language: BASIC
Hardware Requirements: 16K cassette; 24K disk

Department: Education
Sugg. Retail: $24.95
Availability: 6
Disk or Tape: Both

OVERALL RATING	**D**	EASE OF USE	**B−**	ERROR HANDLING	**B**
EDUCATIONAL VALUE	**D−**	DOCUMENTATION	**B−**	RELIABILITY	**B**
VENDOR SUPPORT	**B+**	VISUAL APPEAL	**D−**	VALUE FOR MONEY	**D**

Edupro has consistently developed programs which are educationally sound, but which do not make full use of Atari's sound and graphics capabilities. Because of their solid educational fundamentals, it is easy to forgive a lack of sophistication in the "bells and whistles" of Atari graphics—up to a point. But since this program is totally visual, it rises or falls on its use of the Atari's graphics capabilities. Unfortunately, it finishes with a "thud."

Picture-Play enables up to four players to compose pictures using the standard Atari character set. You have the complete set of upper-case letters, numbers, punctuation, and a handful of the Atari graphics characters to use in your picture. You can draw a moose using the letter M, a landscape using the letter L—your imagination is limited only by the Atari character set, a tool which is inappropriate for composing pictures.

Picture-Play would be a winner if it introduced a handful of alternative character sets, or allowed you to take advantage of the 4-color capabilities of Graphics Modes 1 or 2, but it offers none of these features. Still, don't let this program sour you on Edupro; they offer a line of fine education programs for the Atari. This package, however, seems to be a translation from another computer system, and it doesn't have what it takes to make it in the world of the Atari.

PRE-SCHOOL LIBRARY

Company: PMI
Language: Atari BASIC
Hardware Requirements: 32K

Department: Education
Sugg. Retail: $23.95 each
Availability: 8
Disk or Tape: Both

OVERALL RATING	B−	EASE OF USE	A	ERROR HANDLING	B
EDUCATIONAL VALUE	B+	DOCUMENTATION	B−	RELIABILITY	B
VENDOR SUPPORT	B+	VISUAL APPEAL	D	VALUE FOR MONEY	B−

Four lavishly packaged programs make up *Pre-School Library: Pre-School IQ Builder #1 and #2, Sammy the Sea Serpent,* and *The Adventures of Oswald.* PMI markets the programs individually, so you get a separate disk for each program, plus voice cassettes for the last two. You also receive colorful decals depicting the Sammy and Oswald characters.

Pre-School IQ Builder #1 presents six exercises that require a child to determine the likeness or difference between two objects. The objects include colors, shapes, figures, large letters, capital letters, and lower case letters. The child uses a joystick to indicate if the pairs of objects on the screen are the same or different. *Pre-School IQ Builder #2* continues with the same theme. Its six lessons include lower case letters, numbers, letter shapes, and two- and three-letter words. *Sammy the Sea Serpent* is a classic. Using a joystick, the child helps Sammy return to the sea. A voice cassette accompanies the program, synchronized so that the child receives a reward every time his or her efforts help Sammy get closer to home. The same set-up marks the last program. The child moves Oswald with a joystick and in the process learns concepts such as "to," "back," "climb," and "jump."

PMI is one of the pioneers in computer education, and this library contains four of their best programs. Unfortunately, while educationally sound, none of the programs makes good use of the Atari's sound and graphics capabilities. The graphics are out of date, and the use of a single sound register proved disappointing. However, the programs fulfill their promise. They succeed in teaching basic concepts to pre-schoolers and offer a rare opportunity for children to enjoy a computer without the shoot-'em-up violence that accompanies so much of today's software.

PRIMARY PHONICS LAB 1

Company: Bluestone Software
Language: BASIC
Hardware Requirements: 32K

Department: Education
Sugg. Retail: $19.95
Availability: 1
Disk or Tape: Both

OVERALL RATING	B	EASE OF USE	B−	ERROR HANDLING	B+
EDUCATIONAL VALUE	B	DOCUMENTATION	A−	RELIABILITY	B
VENDOR SUPPORT	B+	VISUAL APPEAL	C−	VALUE FOR MONEY	C+

An unpretentious program, *Primary Phonics Lab 1* drills preschool and primary students on the sounds of the letters of the alphabet without the benefit of a voice synthesizer or taped recording of the sounds. It accomplishes this ambitious task admirably, nonetheless, by showing a picture along with a word missing a letter. The child fills in the blank. I noticed one problem with some of the pictures—often the students did not know the word (like a firecracker's fuse, or a test tube). The pictures are generally of good quality, and children receive sound and color reinforcement but no scores.

Several children asked for their scores after using the program. They enjoyed *Primary Phonics Lab 1,* but required close, almost constant supervision. But you cannot explain the program and come back later to check the child's progress. The first program covers initial consonants, ending consonants, short vowels, and long vowels. Letters appeared in alphabetic order for the most part. Given the caveats of constant supervision and lack of randomness (which keeps a child from enjoying it after a time), I found the program helpful in teaching letter sounds to young children.

PIECE OF CAKE

Company: Counterpoint Software
Language: Atari
Hardware Requirements: 48K

Department: Education
Sugg. Retail: $29.95
Availability: 3
Disk or Tape: Both

OVERALL RATING	**C+**	EASE OF USE	**A**	ERROR HANDLING	**A**
EDUCATIONAL VALUE	**C+**	DOCUMENTATION	**B+**	RELIABILITY	**A**
VENDOR SUPPORT	**B−**	VISUAL APPEAL	**A−**	VALUE FOR MONEY	**C+**

Piece of Cake is a set of five math games with a bakery theme. The Bakery involves adding and subtracting cakes as they are baked and sold each day for a week. Multicake tells how many slices a cake can be cut into and asks for the total pieces produced. Dividacake asks for the number of pieces each slice must be cut into to produce the correct total. Flash cards provides addition, subtraction, multiplication, and division problems. Catchacake is a game involving catching cakes before they hit the floor by solving arithmetic problems.

The use of color, sound, and animation to reinforce basic math concepts is well done. The games are interesting, if rather slow. In the first three programs, each problem is presented up to four times with different degrees of help provided. The way the programs are designed, the child never has to press Return after an answer. This is very convenient when working with young children.

The major problem with this package is that the authors seem confused about the age group they are addressing. The format and speed of the games are designed for first or second graders. The documentation comments that the Picture Menu, which enables children to select a game, is an important feature. (The cassette version only contains the Word Menu.) This implies use by very young children who are just beginning to read. Each game, however, is a series of word problems which involve reading at a level appropriate to first or second grade. ("If a cake has nine slices and each slice has seven pieces, how many pieces in all?")

The math skill levels addressed in the program called The Bakery are for young children. The program shows each cake and asks for the total, which never exceeds twenty. The Cutacake and Dividacake programs work with multipliers and divisors up to ten. The Flash Cards program is divided into five levels for each of the four types of problems. While the format and speed of the games indicates that they are aimed at lower grade children, much of the math would require even upper elementary children to use pencil and paper to solve the problems. Older children would find the games tedious, while younger children would be unable to do the required math. As a result, the total package loses much of its usefulness.

PUNCTUATION PUT-ON

Company: Atari Program Exchange
Language: BASIC
Hardware Requirements: 32K

Department: Education
Sugg. Retail: $34.95
Availability: 8
Disk or Tape: Disk

OVERALL RATING	**B−**	EASE OF USE	**A**	ERROR HANDLING	**A**
EDUCATIONAL VALUE	**C+**	DOCUMENTATION	**A**	RELIABILITY	**A**
VENDOR SUPPORT	**C**	VISUAL APPEAL	**C**	VALUE FOR MONEY	**C**

Punctuation Put-On targets children aged eight to fourteen. It drills you on punctuation by letting you choose from three stories or two poems. Your choice appears on the screen, giving you a chance to study the correct punctuation before the punctuation marks disappear and you fill them in again. Each selection includes twenty punctuation marks plus ten random marks. You can repeat the exercise as often as you like, and the score tells you your mistakes and the percentage of correct insertions. Other options in the Main Menu include a practice lesson in typing punctuation marks, a review, updating your score, and a display of the errors made for each punctuation mark.

The program runs well and responds quickly to input, and the documentation is clear and easy to understand. Unfortunately, *Punctuation Put-On* never explains why punctuation marks belong in one place rather than another. As a result, it stresses repetition rather than learning concepts of punctuation.

SPELLING BEE GAMES

Company: Edu-Ware
Language: Atari BASIC
Hardware Requirements: 48K

Department: Education
Sugg. Retail: $39.95
Availability: 9
Disk or Tape: Both

OVERALL RATING	**B**	EASE OF USE	**C**	ERROR HANDLING	**A**
EDUCATIONAL VALUE	**B+**	DOCUMENTATION	**A**	RELIABILITY	**A**
VENDOR SUPPORT	**B+**	VISUAL APPEAL	**A**	VALUE FOR MONEY	**A-**

Spelling Bee Games includes four games for elementary school students aged five to ten. "Squadron," a word recognition game, also develops eye-hand coordination. This game is limited to two players who "fly" their airplanes to the appropriate words identifying pictures displayed at the bottom of the screen. As many as four players can play "Skyhook," taking turns spelling words associated with displayed pictures by using a helicopter equipped with a skyhook to pick up letters and place them in the correct order. "Puzzle" resembles "Concentration." Six pictures are briefly shown and then covered. A player's name will appear along with the name of one of the six pictures. That player must identify the correct panel number covering the picture. The fourth game is "Convoy," in which one to four players can compete. A picture appears in the upper part of the screen. The players take turns typing the letters of the word naming the picture while trucks of players who make correct responses advance across the screen.

Spelling Bee Games consists of two disks. The games occupy the first disk and the high-resolution picture files used in the games occupy the second disk. The documentation explains a reconfiguration option that permits people with two disk drives to reconfigure the program in order to take advantage of two drives. You can choose among twenty-two units or word lists for the games. For example, a list of simple two-and three-letter words suits younger students. For more advanced students, words with hard c's and silent e's offer more challenge. Units can be used singly or in combination to fit the capabilities of students playing the games, or to stress certain types of words.

This is not a spelling drill and practice program. Also, no provision exists for a teacher to add a list of words. However, the games make recognition and spelling enjoyable.

TEASERS BY TOBBS

Company: APX
Language: BASIC
Hardware Requirements: 16K

Department: Education
Sugg. Retail: $29.95
Availability: 8
Disk or Tape: Disk

OVERALL RATING	**C**	EASE OF USE	**C-**	ERROR HANDLING	**N/A**
EDUCATIONAL VALUE	**B**	DOCUMENTATION	**B**	RELIABILITY	**B**
VENDOR SUPPORT	**C**	VISUAL APPEAL	**C**	VALUE FOR MONEY	**C**

Teasers by Tobbs is a math drill and practice program for addition and multiplication with a twist. At the simplest levels it is a straightforward drill. Numbers to be added or multiplied appear in rows and columns, as in multiplication tables, and you fill in the answers. At the lowest levels, you may get some of the answers, but as the difficulty increases you have to answer more questions first. At the intermediate levels, you may get the sum or product and have to work backwards to find the numbers missing from the table. At the highest levels, you face many blank spaces and more than one answer is possible. At this point you need to determine whether the answer is fixed or lies within a range. At the end of each problem, the computer tallies your score and offers you the choice of continuing at the same level.

The presentation struck me as overly cute and the operation, clumsy. I would definitely not recommend it for children who do not like math, because it is a barely-disguised math drill. Quite simply, the user interface is poorly designed, partly because of trying to fit a disk-based program into 16K. Most Atari systems (on disk) have at least 32K or 48K, so 16K is a limitation here. It necessitates constant disk access and makes it difficult to move from one section of the program to another. Poorly designed nested menus and constant pushing of the Return key for no good reason further complicate using the program.

Sound and graphics are average. You see a problem grid, and Tobbs, a well-drawn character with owlish glasses who shakes his head at wrong answers and occasionally jumps up and down or changes colors for right ones. He also points to the problem to be solved at any time. Some simple sound effects accompany his actions.

TURTLE TRACKS

Company: Scholastic Software
Language: Atari BASIC
Hardware Requirements: 32K

Department: Education
Sugg. Retail: $34.95
Availability: 8
Disk or Tape: Disk

OVERALL RATING	**B**	EASE OF USE	**B**	ERROR HANDLING	**A−**
EDUCATIONAL VALUE	**B+**	DOCUMENTATION	**A**	RELIABILITY	**B+**
VENDOR SUPPORT	**B**	VISUAL APPEAL	**C**	VALUE FOR MONEY	**B**

Turtle Tracks teaches fundamental data processing concepts. While it targets a school-age audience, I think that adults who want to familiarize themselves with the way a computer functions will find the program of immense value.

As its name suggests, *Turtle Tracks* introduces you to yet another turtle, but one who doesn't speak either PILOT or LOGO. The program's ten lessons teach you the strange dialect the turtle speaks. Compared to PILOT or LOGO, this turtle has a very limited vocabulary. It can "draw forward" (leaving a trail) or "jump forward" (without a trail). It can also turn right or left. In giving the turtle instructions, you can use a maximum of two variables and three nested loops. You can write and save subroutines to include in the program, and you can combine programs easily. *Turtle Tracks* gives you moderate flexibility in choosing colors and sound, letting you choose either Graphics Mode Zero or Graphics Mode One.

The main program is large (115 sectors) and written in BASIC. While I found it slow in digesting its turtle commands, turtles are not known for their speed. On the other hand, the documentation is excellent. It assumes that you bought your Atari computer yesterday and walks you through the turtle's paces simply and without condescension. The manual includes a glossary, a compendium of common "turtle mistakes," and answers to the quizzes at the end of each of the ten lessons.

If you're interested in learning the fundamentals of computing without delving into one of the heavier languages, *Turtle Tracks* will suit you just fine.

TYPO

Company: Romox Inc.
Language: Machine
Hardware Requirements: 8K

Department: Education
Sugg. Retail: $44.95
Availability: 4
Disk or Tape: Cartridge

OVERALL RATING	**A**	EASE OF USE	**A**	ERROR HANDLING	**A**
EDUCATIONAL VALUE	**A**	DOCUMENTATION	**B**	RELIABILITY	**A**
VENDOR SUPPORT	**B**	VISUAL APPEAL	**A**	VALUE FOR MONEY	**B+**

If learning to type can ever be fun, *Typo* has done it. *Typo* is a one player touch typing game. The scenario is a maze littered with dots, with a window in the center of the screen where letters, words, or phrases appear. Select the speed that you want (or a little faster if you want to push yourself), push the start button, and type away.

As you type, a ship eats the dots in the maze. But beware, there is a yellow monster lurking near you, moving at the speed you selected for your words per minute (wpm). Typing faster than your prescribed wpm will keep your ship safely away from the monster. If the monster catches your ship, it will fall to the bottom of the screen. Your goal is to get all the dots without getting caught by the monster. *Typo* is entertaining and gives you plenty of motivation.

Typo has many options to choose from (like letters, words, or phrases). If you get bored with the pre-saved vocabulary, there is an option to enter your own which will be displayed randomly when you begin the game. Other features include a pause button and a help button which instructs you on entering different options.

Typo is well constructed, which makes it delightful to use. It has nice, articulate graphics, is very colorful, and plays music in the background. I would recommend this program to anyone who wants to have fun learning to type.

TYPO ATTACK

Company: Atari Program Exchange
Language: Machine
Hardware Requirements: 810, 16K

Department: Education
Sugg. Retail: $29.95
Availability: 9
Disk or Tape: Disk

OVERALL RATING	B	EASE OF USE	B	ERROR HANDLING	A
EDUCATIONAL VALUE	C+	DOCUMENTATION	B	RELIABILITY	A
VENDOR SUPPORT	C	VISUAL APPEAL	B	VALUE FOR MONEY	B

Typo Attack resembles an arcade game. In fact, it reminds me of *Space Invaders*. You type the characters beneath eight bases subject to bombardment from falling typos; the typos fall faster as you move to a new wave. If you fail to fire the energy bolt, the typo hits the ground and digs toward your base. If one makes it all the way through the buffer zone protecting your base, an explosion ends the game.

This is a typing program? Yes, and while you madly hit at the keys, you become aware of their position on the keyboard. Unfortunately, the game does not give the novice a very good orientation to the keyboard. Home keys a, s, d, f, and j, k, l, and ; should be used longer before starting on other keys. However, the author does not claim to be teaching you typing. You may want to choose a typing tutorial first and reward yourself for endurance with *Typo Attack*. It offers nine skill levels, and presents a scoreboard display before each new wave appears.

WORDGO

Company: APX
Language: Atari BASIC
Hardware Requirements: 40K

Department: Education
Sugg. Retail: $24.95
Availability: 8
Disk or Tape: Disk

OVERALL RATING	B	EASE OF USE	B+	ERROR HANDLING	A
EDUCATIONAL VALUE	B	DOCUMENTATION	B	RELIABILITY	A
VENDOR SUPPORT	B	VISUAL APPEAL	A-	VALUE FOR MONEY	A-

In *WordGo* you try to mark four squares in a row—horizontally, vertically, or diagonally. This program demands strategy and quick thinking, helping you improve word attack skills, spelling, and vocabulary. The playing field (a four-by-four grid on a Graphics Mode 7 screen) employs four colors with a fifth marking the cursor. Each box contains a word ending (such as "ool" or "ief") in letters large enough to be seen at a distance from the television screen.

One or two people can play this game, but they compete against the high score, not each other. If two people play, you each have your own playing screen. A blend (two or three consonants together, such as "scr" or "bl") appears at the top of the screen and a thirty-second timer begins counting down. You have two options. Either find an appropriate ending on your screen ("scrap" or "blank," for example), or press the Select key to indicate that no proper combination exists. To choose a combination, you move the cursor to the proper square with the joystick and press the trigger. The word displays at the top of the screen, and your score increases by an amount depending upon the time remaining. Play then passes to your opponent. You are not penalized for incorrect choices except that the timer continues, unless you press the Select key when a combination is possible. In that case, your score drops substantially. Strategy is important, because if you complete two or three rows at the same time, the score (normally doubled) quadruples for two complete rows, and is doubled again for three rows. If you manage to end in a strategic position, you can obviously increase your score tremendously.

At any time you can check the meaning of a word by holding down the trigger as you indicate your choice. The computer accesses a dictionary file by using the Point command. This helps you learn unfamiliar words, plus new definitions of familiar words. Although some of the words would not fall within the normal vocabulary of a younger player, the game targets ages eight through adult. I watched my seven year old daughter, my ten year old son, and several adults play with notable success. The only criticism was of the difficulty in placing the cursor quickly using the joystick. My children especially liked making words and competing against the high score rather than each other. My son said that he liked the sound effects, but I thought this the weakest part of the program.

You need to watch out for a few things. The Break key has not been disabled, and pressing it causes the program to crash. Pressing Option starts the game over, so you must be careful not to press this key when reaching for the Select key. Pressing System Reset reloads the program from the disk. Luckily, the documentation is clear and concise. It describes the game, gives helpful hints, and briefly discusses the game's educational objectives. The game better suits recreation, but it does teach along the way. *WordGo* is one of the best word games I have seen, and I heartily recommend it.

WHAT'S IN YOUR LUNCH

Company: Lawrence Hall of Science
Language: Atari BASIC
Hardware Requirements: 16K Cassette; 32K Disk

Department: Education
Sugg. Retail: $24.95
Availability: 2
Disk or Tape: Both

OVERALL RATING	C	EASE OF USE	C	ERROR HANDLING	C+
EDUCATIONAL VALUE	C−	DOCUMENTATION	C−	RELIABILITY	B+
VENDOR SUPPORT	C	VISUAL APPEAL	C	VALUE FOR MONEY	D

What's in Your Lunch provides you with quantitative information about the nutritional content of common lunch items. The program comes with a menu card listing 117 lunch items (49 in the cassette version). These items are grouped into ten categories such as sandwiches, dairy products, fruits, beverages, sweets, and so forth.

The program asks for your name, age, height, sex, and activity level, and you enter the numeric code for up to nine items eaten at lunch. The program calculates the number of calories you need per day. It assumes that one-third of those calories should be consumed during each meal. The program then graphs the percentage of the following items: calories, protein (grams), fat (grams), sodium (mg), calcium (mg), iron (mg), riboflavin (micrograms), vitamin C (mg), and vitamin A (mg). It indicates whether you consumed more or less than one-third of the daily requirement.

That is the extent of the program. You cannot obtain a printout, nor add breakfast and dinner to get a total for the day. The food list includes only lunch items, though it allows you to add lunch items not in the program. However, every item added must be researched for the nutritional data. The documentation includes information about Basal Metabolism Rates, mean heights and weights and recommended energy intake, activity levels, and recommended daily allowances of nutrients, but does not give any information about running the program.

UTILITIES

ATARIWRITER PRINTER DRIVERS

Company: APX
Language: Machine
Hardware Requirements: 32K, *Atariwriter*

Department: Utilities
Sugg. Retail: $24.95
Availability: 3
Disk or Tape: Disk*

OVERALL RATING	A	DOCUMENTATION	C	RELIABILITY	A
EASE OF USE	A	VISUAL APPEAL	N/A	USEFULNESS	A
VENDOR SUPPORT	C	ERROR HANDLING	N/A	VALUE FOR MONEY	B+

Atariwriter Printer Drivers enable the *Atariwriter* word processor to work with printers other than the Atari 820, 822, 825, and 1025 printers supported by the cartridge. With this program, the word processor also supports the Atari 1020 and 1027, Epson FX-80, MX-80, MX-100, MX-80FT III, MX-100FT III, MX-80 and MX-100 GRAFTRAX models, GEMINI-10, NEC-8023A, and PROWRITER-8510. Depending upon the printer, these printer drivers allow underlining, sub-and superscripts, condensed or proportional fonts, elongated characters, and double-column printing. Without the drivers, you would need to embed printer control codes within your text.

You can transfer these drivers to your word processing disk and rename them Autorun.sys, which ensures that they get placed into memory automatically when you boot the disk. The drivers are completely transparent, and you need only use *Atariwriter* commands to employ any of their special features.

BASIC XL

Company: OSS
Language: Machine
Hardware Requirements: 16K

Department: Utilities
Sugg. Retail: $99.95
Availability: 4
Disk or Tape: Cartridge

OVERALL RATING	A	DOCUMENTATION	B+	RELIABILITY	A
EASE OF USE	A–	VISUAL APPEAL	N/A	USEFULNESS	A
VENDOR SUPPORT	A–	ERROR HANDLING	A	VALUE FOR MONEY	A

BASIC XL, a fast and powerful extension of Atari BASIC, offers a number of important features that did not fit in the original 8K ROM cartridge. The language resides in a 16K cartridge, yet occupies only 8K of RAM space in the computer. It does this by internally bank selecting between the 8K ROMs. This makes *BASIC XL* compatible with Atari BASIC because they both use the same token structure. In addition, the program precompiles your program, assigning all line numbers and their references absolute addresses in memory. Execution increases two and a half times, or you can choose to stick with the normal speed.

Noteworthy features include handling DOS commands from BASIC, extended I/O, trace commands with error messages, print using, memory move commands, player-missile graphics, and better string handling (including string arrays). Other features include several structured programming features like IF. . . ELSE. . . ENDIF and WHILE/ENDWHILE, automatic line numbering, renumber commands, and deletion of line number ranges.

The program allows easy access to player-missile graphics and lets you move the players around the screen at almost Machine language speed. All operations resemble setting up simple drawing commands. PMGRAPHICS sets up the system, PMWIDTH determines the player's width, PMCOLOR(n) sets the color, and PMCLR clears out the player missile area. PMMOVE positions a player on the screen. You can set the horizontal and vertical positions together or separately. MISSILE creates a missile which you can move with PMMOVE. BUMP reads the collision register. HSTICK and VSTICK return delta-X and delta-Y offsets for the joysticks, simplifying reading the game ports. Another command detects the position of a light pen.

The designers also added input-output commands. You can call most of the DOS commands (like DIR, PROTECT, UNPROTECT, ERASE, and RENAME) directly from *BASIC XL*. You can load and save binary files at Machine language speeds with the commands BPUT and BGET. You can load or save entire screens, and a word

processor saves the text file (this normally requires a Machine language program). The program automatically handles numbers in a seven byte internal storage format, thus efficiently performing record processing.

PRINT USING statements make screen formatting much easier. By correctly specifying the format field, you can format numbers containing decimal points (important in lining up columns at the decimal point). The program rounds the numbers off to fit the format field. You can also specify other format characters, such as "$" for dollars, "," to insert commas into large numbers, or "&" to fill in unused digits with zeros. Other options use the "+" sign for positive quantities, and string formatting with left or right justification specifies "%" and "!" signs. *BASIC XL* also supports TAB and works with a printer.

The addition of string arrays greatly enhances string manipulations, which simplifies character data manipulation. You can separate strings, and FIND searches for a substring within a string. String concatenation has also been simplified. For example, A$ =A$ +B$ becomes A$ =A$,B$ and A$ (LEN(A$)+)=C$ becomes A$ =B$,C$. Naturally, you can convert strings to numbers and vice versa.

The language includes some nice debugging features. For instance, a trace displays line numbers during the program's execution. LVAR lists to the screen all the variables currently in use (helpful when approaching the 128 variable name limit). Error messages are in simple English, and error handling becomes slightly easier with TRAP, which gives you the error number and line number. I should mention that the program even has sixteen bit PEEK and POKE commands.

Any program written in Atari BASIC runs in *BASIC XL* but not vice versa even though the token structures are compatible. A run-time package available from the manufacturer for use in commercial software carries a one-time use fee of $300.00. *BASIC XL* is also compatible with Atari DOS, OS/A+ DOS, and OSS's new DOS XL. *BASIC A=* owners will recognize a strong similarity. The major changes are the addition of string arrays, miscellaneous commands, and the ability to precompile for faster execution. Since *BASIC A=* uses a different token structure, it is not compatible with *BASIC XL*. However, a new utility will soon become available for converting those programs to the new language.

The extensive 134-page manual integrates regular BASIC commands with the new commands, a welcome change from the old *BASIC A=* manual that included pages to be inserted in the Atari BASIC user's manual. The documentation for this program includes many examples, several illustrations, and an extensive appendix.

BASIC XL is a fast and powerful extension of Atari BASIC, totally compatible with virtually all software. Its many features make programming easy, especially games that require player-missile graphics. For people writing business software or translating existing programs from other computers, the new string arrays and other string handling features make the task manageable. *BASIC XL* is a truly professional language that should become standard in all future Atari computers.

CASDUP

Company: IJG, Inc.
Language: Assembly
Hardware Requirements: 16K

Department: Utilities
Sugg. Retail: $24.95
Availability: 4
Disk or Tape: Tape

OVERALL RATING	B	DOCUMENTATION	C+	RELIABILITY	A−
EASE OF USE	B	VISUAL APPEAL	N/A	USEFULNESS	A
VENDOR SUPPORT	B	ERROR HANDLING	B−	VALUE FOR MONEY	A

At first glance, *Casdup* might appear to be only a cassette duplicating utility. Look again. It lets you copy BASIC program files, data files, "boot files," and "uncopiable" machine language tapes; helps you recover most of a damaged file with no EOF; converts stop-start file load programs into continuous loading programs; and merges programs from several tapes onto one. It supports single and multiple file programs, continous and start-stop files, and combinations. The cassette contains two programs: a file oriented and a sector oriented program. The simple operating instructions explain the difference. The sheer variety of options may confuse you, and it may take some experimenting to copy multiple files, but the instructions are clear and the screen prompts help guide you. The hex codes after each file load (for advanced programmers) annoyed me; I thought them useless. The error codes (also in hex) force you to look in the manual. One last problem is the memory. *Casdup* requires 2K of memory, so you cannot copy a tape of more than 14K without encountering complicated multifile load procedures. Despite this, I think the package more than worth the price.

COMPILERS

Atari BASIC, the most popular language available on the Atari computer, is an interpretative language. As such, it requires a Machine language program to supervise the execution of each BASIC line used. This means that it runs slowly when compared to an equivalent program written in pure Machine language. The interpreter scans your program while it runs in order to find the appropriate subroutines for that chore within its own program code. In addition, it scans your program for the next statement whenever it finds a branch statement in a GOTO or IF statement. The solution is to use a compiler to translate BASIC programs into Machine code. That way the program runs faster because scanning and decoding occur only once—during compilation. Programs written in BASIC that require a real time environment or fast frame rates, such as games, often improve dramatically in speed when compiled.

Three software companies market compiler-like programs. Both Monarch Data Systems and Datasoft offer true compilers, while Computer Alliance offers what would be more aptly called a BASIC assembler. This program, called *BASM*, is a hybrid language that combines the simplicity of BASIC with the power and data structure of Assembly language. Each of these programs compile BASIC programs into object code that runs much faster than interpreted BASIC. Speed increases vary widely, and often depend on the structure and length of your program. In general, long programs using a large number of variables and doing a great deal of logical branching within the program will execute faster after compiling. In addition, the use of integer variables only, which allows you to use either Monarch's compiler or the Integer option on Datasoft's compiler, will produce code on the order of two to three times faster than a similar program employing floating point variables. Code expansion, a problem on some computers during compiling, offers no problems. You will more likely find disk storage space a limiting factor.

The ABC compiler, a single pass compiler, is the easiest to use. While most of the compilers require extensive changes to your program in order to compile, ABC requires little or no change if the program originally used integer variable constants. Of three attempts to compile two games and one utility program, only one failed on the first attempt. That program generated no errors, but the playfield, which used a modified character set and horizontal display list interrupts to achieve color, did not appear. However, the player missile worked. The working programs were five to six times faster even though the originals used machine language subroutines to drive the player-missile graphics. Evidently extensive logic in the BASIC versions slowed down the frame rate. The utility program compiled to about 20% larger than the original, while the game, which contained a lot of DATA statements and comments, ended up about 25% smaller even with the run-time library attached.

Of course, an Integer compiler doesn't support all BASIC language statements. The lack of floating point math prevents the use of SQR, COS, LOG, RND, and so on. RND, although not supported, can be simulated. Other commands like LPRINT, SAVE, ENTER, CSAVE, CONT, and DOS are also not supported. Unlike the Datasoft compiler, which places DATA statements at the end of the program, DATA statements may turn up anywhere in your program.

Compiling a program is simple. Your BASIC program resides on a regular DOS formatted disk with a BAS extender. The compiler asks for the name of the source file and the name of the object file. It begins compiling and immediately announces the number of variables and the lines in the program. It then compiles line by line at a rate of about 100 lines per minute. If it encounters an error, an error message number is given and the compiler asks you if you wish to continue. Some program will work even with a minor error. The entire operation takes place in one pass with no disk swaps required. The program compiled into P-code is then loaded with the L-option from the DOS menu. The assembler will allow you to compile at two different run-time addresses and can generate relocatable code.

Datasoft's compiler is a three-pass compiler with two options for Integer and Floating-point BASIC programs. It has a number of command restrictions like CSAVE, DOS, CONT, LIST, LOAD, and so on. All DATA statements must be placed at the end of the program, variables can't be used in GOTO statements, and FOR/NEXT loops can only be terminated with a single NEXT. It also includes a restriction on the way strings are handled. You can't have substrings on the left side of the "=" sign. You can handle this restriction with PEEKs and POKEs if you are a skilled programmer. Because delay loops are lightning fast, you will need to use the system timers to build delays into your programs.

I tried compiling the same programs that I used with the ABC compiler, but was unsuccessful in getting them to run properly despite getting no compile errors. I attribute this to a conflict in memory, but I'm not sure because one of my two-page, six Machine language subroutines worked. Why the sound loop, a single FOR-NEXT loop, hangs baffles me. The inability to compile anything other than the short sample programs was discouraging. The 102-sector program did compile to ninety-nine sectors including the run-time library. Also, the diagnostics are superb. The compiler flags the line number for each error, so that you can continue compiling, noting each error as it occurs. You can also obtain a line map on the screen or printer, which helps you locate a run-time error since the location of the machine language code for each line number is cross referenced.

BASM is a two-pass BASIC assembler that takes a unique hybrid language, a combination of BASIC and Assembly line statements, and compiles the BASIC portions while assembling the Assembly statements into pure Machine code. This method produces extremely fast code with speeds up to 130 times that of the original. The advantage arises because the language is closer in format to BASIC and easier to learn than pure Assembly language. In theory, you could learn to understand Assembly language by watching this compiler/assembler produce readable Machine language. The language differs widely from either BASIC or Assembly, and like all new languages, takes time to learn. It uses many structured statements like WHILE, ENDWHILE, and ENDIF. Additional operators like OR, AND, XOR, and NOT have been added. Graphics commands are supported but require opening a channel before using and closing. You can freely mix BASIC with standard Assembly language in any statement, useful for indirect addressing in a BASIC statement.

Despite a lengthy manual that describes all the commands available, beginners will have great difficulty in learning and using the language. You enter all lines in the editor mode. The text editor resembles those in other assembler packages, but it doesn't check syntax. You learn the extent of your errors only at compile time. In fact, you get few error messages. When I tried compiling two of the examples in the manual, the first only six lines long, the program informed me that there were four errors. The longer program generated twenty-four. The manual advised that exact spacing of terms is critical, so I checked that also, but I could not find my errors. I'm not implying that the program doesn't work, only that you may have trouble using it.

The consensus is that compilers generate faster code than can be obtained with BASIC interpreters. Each of the compilers has its advantages and disadvantages. The *ABC Compiler* is the easiest to use, and useful if your program uses Integer variables only. It generates fast P-code impossible to read, which although not as fast as Datasoft's, takes less space. It is also the least expensive. Datasoft's compiler is a pain to use, especially if you don't have two disk drives. However, it works faster and can compile programs with floating point operations. It also has the advantage of Assembly language code that you can tinker with. Its main disadvantages are that BASIC programs sometimes need significant changes to compile, and that large programs can't be compiled because of a combination of code expansion and limited disk storage. Finally, I think BASM worth looking into, but find it hard to compare it to the others because it needs specially written programs to work. It is fast, but difficult to learn.

DISKSCAN

Company: CDY Consulting
Language: BASIC & Machine
Hardware Requirements: 32K

Department: Utilities
Sugg. Retail: $40.00
Availability: 4
Disk or Tape: Disk*

OVERALL RATING	**B+**	DOCUMENTATION	**B-**	RELIABILITY	**A**
EASE OF USE	**A**	VISUAL APPEAL	**B**	USEFULNESS	**A**
VENDOR SUPPORT	**B-**	ERROR HANDLING	**C+**	VALUE FOR MONEY	**B-**

One of the easiest to use utilities on the market, *DiskScan* possesses all the features needed to scan and repair damaged disks. You can scan entire files sector by sector, attending to or ignoring link sector pointers. The program also includes several Assembly language features like a disassembler and assembler, useful for modifying program code on the disk. The Assembly language support surpasses all other disk utilities that I have seen. Many have a built-in disassembler, but none offers a mini-assembler. Disassembly occurs on the right side of the screen, letting you see the entire sector at a glance. You choose the starting point, and two arrows mark the bytes undergoing the process. If you want to modify a section, you enter Assembly language instructions. This enters the hexadecimal data directly into the sector.

This menu-driven program lets you enter data in decimal, hexadecimal, or character form. The package contains a hex to decimal converter for your convenience. The heart of the program allows reading and modifying individual 128-byte sectors, displayed on the left side of the screen. Unlike other disk utilities, the right side of the screen displays the disassembly of the data rather than character interpretation. Pressing the T-key toggles character data interpretation. You can edit data in either mode, moving the cursor about the screen via the CTRL-arrow keys. The cursor advances to the next byte after each entry. When finished, you can write the sector back to the disk, or to another sector. A search feature lets you locate one or two bytes on the disk, but *DiskScan* cannot map the disk, which although not essential, helps you check for bad files. On the other hand, the disk directory reads automatically, and the display is readable. The program also supports a line printer. All unprintable characters appear as dashes. Another important feature is *DiskScan's* ability to create a DOS binary load file from several sectors of raw non-linked data sectors, a useful ability for those who own an Omnimon.

The documentation is adequate and includes a good introduction of the DOS file structure of a standard disk. It explains the directory, the VTOC, and how to format file types, including the extremely important link sector data in each file sector.

DRAW IT 1.0

Company: APX
Language: BASIC
Hardware Requirements: 16K

Department: Utilities
Sugg. Retail: $39.95
Availability: 8
Disk or Tape: Both

OVERALL RATING	**A**	DOCUMENTATION	**B**	RELIABILITY	**A**
EASE OF USE	**A**	VISUAL APPEAL	**A**	USEFULNESS	**B+**
VENDOR SUPPORT	**C**	ERROR HANDLING	**A**	VALUE FOR MONEY	**A**

The graphics utility *Draw It 1.0* lets you draw pictures, color them, and save them to disk or cassette. It only takes a few minutes of practice. The disk contains Draw It, which creates the drawings and saves them, and Animator, which lets you format the drawings and create animated screens. The thirty-four page manual contains most of the information on implementing commands, but does not always explain well (such as how to save your new picture and place it in your own program). You can save nine separate pictures with 48K of memory, and five pictures with 32K. You draw the pictures with simple commands, and use four colors (one of them the background) and eight hues to tint the picture. You have sixteen colors to choose from, but only four can be on the screen at once. With a minimum of expertise you can quickly construct such configurations as lines, rectangles (outlined or solid), circles (outlined or solid), text of different sizes, and freehand sketches. A zoom feature with two levels of magnification let you view the sketch up close for detail work.

The program responds quickly to the joystick-controlled cursor, which you can set for normal or fast speed. I noted no bugs, and enjoyed using the program. I thought the manual well documented with some exceptions. The

disk comes with many pictures drawn in detail to help you learn the function keys and experiment with color. The Animator demonstrates its capabilities for you. Formatting your own file for animation is another story, however, complicated by unclear descriptions. I recommend this package highly despite the drawbacks in the documentation.

FDOS

Company: SUPERware
Language: Extended fig-FORTH
Hardware Requirements: 16K

Department: Utilities
Sugg. Retail: $39.95
Availability: 3
Disk or Tape: Disk

OVERALL RATING	C	DOCUMENTATION	CD	RELIABILITY	C
EASE OF USE	C	VISUAL APPEAL	N/A	USEFULNESS	C
VENDOR SUPPORT	D	ERROR HANDLING	C	VALUE FOR MONEY	C

A major shortcoming of FORTH is its incompatibility with disk operating systems. *FDOS* provides extension words to APX's Extended fig-FORTH to make this version of FORTH compatible with DOS. A package of this type is long overdue; unfortunately, *FDOS* has some serious flaws of its own.

On either a one drive or two drive system, *FDOS* words will convert DOS files to FORTH screen-compatible *FDOS* files. Data can be read from either DOS or *FDOS* files to any desired RAM area, or written from RAM to *FDOS* files. FORTH screens and *FDOS* files can be copied and moved around, and *FDOS* files can be subjected to DOS-like manipulations. The latter functions include Delete, Rename, Lock, and Unlock. No *FDOS* to DOS conversion, or other actions which would result in creation of a DOS file, are supported. Both DOS and *FDOS* directories can be displayed. *FDOS* files can only be stored on *FDOS* initialized disks, each of which takes several minutes to prepare. A bootable FORTH and FORTH source screens can co-exist on an *FDOS* disk with *FDOS* files.

Graphics files, such as those created using Datasoft's *Graphic Master*, convert easily using *FDOS*. Simply load the file in DOS or *FDOS* form to RAM starting at the beginning of screen memory. Text files are another matter. Every type of character data file that I tried—tokenized and untokenized BASIC source, word processor files, database files—came out garbled when loaded to screen RAM. Character data on the screen could successfully be saved to an *FDOS* file and redisplayed by loading to screen RAM. There may be a method to accomplish the same thing with character data in DOS files, but the documentation gives no help in discovering it.

Three pages of documentation consist mostly of a glossary of *FDOS* words. The explanation is clearly written, but does not cover the full use of *FDOS*. One example of an *FDOS* file would have been a life-saver. As for vendor support, the documentation does not even contain an address for SUPERware, let alone a telephone number. It would not take much for SUPERware to upgrade *FDOS* to a super product, but as it stands, it does not measure up.

FORTH TURTLE GRAPHICS PLUS

Company: Atari Program Exchange
Language: APX Extended fig-FORTH
Hardware Requirements: 24K

Department: Utilities
Sugg. Retail: $17.95
Availability: 7
Disk or Tape: Disk

OVERALL RATING	C	DOCUMENTATION	D	RELIABILITY	C−
EASE OF USE	C	VISUAL APPEAL	A	USEFULNESS	C+
VENDOR SUPPORT	C	ERROR HANDLING	C	VALUE FOR MONEY	C+

Turtle graphics is usually thought of as either a device for introducing children to computer programming, or a robot control language. *FORTH Turtle Graphics Plus* is neither of these. Rather, it simply adds some graphics extension words to APX Extended fig-FORTH, in a turtle graphics form.

These extension words let you create rectangular windows of any size on screen with their own coordinate systems independent of the screen proportions or boundaries. Within a window, the invisible turtle can turn any number of degrees, move with or without drawing, or create several pre-defined shapes (square, circle, cube). Lines extending

beyond the window boundaries are automatically clipped. GTIA modes 9 and 11 are supported in addition to the usual BASIC modes. Mode 10 is not included.

Since the drawing and window-filling functions use Extended fig-FORTH's Plot and Draw words, the action is a little slow. For example, it takes about ten seconds to fill the screen with a solid color in Graphics 8. Many traditional turtle capabilities such as "senses" are not included. It is possible, however, to create the usual recursive designs, since a recursive capability is part of the package. The sine, cosine, and tangent functions have been implemented in integer table form. The program also includes a Hi-Res screen dump for Epson printers with Graftrax.

The fourteen-page manual briefly explains each turtle word and contains a few examples. On the whole, this is some of the skimpiest documentation I have yet encountered. The entire FORTH source code is printed in the back, but all of the definitions are crammed into nine screens. In addition, some of the demonstrations perform in a strange fashion. For instance, as a spiral grows outward, at some points the completed portion is erased while the outer portion continues to grow. *FORTH Turtle Graphics Plus* is a tool for experienced FORTH programmers; it is not the usual LOGO or PILOT style package.

FUN WITH ART

Company: EPYX
Language: Machine
Hardware Requirements: 32K

Department: Utilities
Sugg. Retail: $40.00
Availability: 6
Disk or Tape: Cartridge

OVERALL RATING	A	DOCUMENTATION	B	RELIABILITY	A
EASE OF USE	A	VISUAL APPEAL	A	USEFULNESS	A
VENDOR SUPPORT	B	ERROR HANDLING	A	VALUE FOR MONEY	A

Fun With Art, although a very sophisticated drawing package and graphics program, is simple enough for even a first-time computer owner to use. It is chock-full of advanced features rarely found in such an inexpensive and easy-to-use drawing program.

What makes the program simple and fun to use is its joystick operated graphics menu. All of the program's functions are shown by symbols. As the joystick-controlled cursor moves across each symbol, its function is displayed in the text window. Then, you select the function with the joystick button. The START-key shifts the view to the graphics 7 ½ screen. This graphics mode, ANTIC E, is a four color mode with a resolution of 160 pixels horizontally by 196 pixels vertically. Essentially, it has twice the resolution of Graphics Mode 7. Its screen memory requires 7,696 bytes.

The cartridge has a number of drawing modes. You can draw with any color register and with a selected brush size by holding the trigger down and moving the joystick around the screen. Straight lines are the easiest. You mark one end at the selected position by pressing the trigger, and then move the joystick cursor to the other end and press again. You connect the line segment by pressing a third time. A box can be quickly drawn by placing marker points at its two diagonal corners and then pressing the button a third time. Likewise, circles are formed by placing a marker at the center and a second marker along its arc. A perfect circle rapidly appears by pressing the trigger once again. (You can't draw an arc, but you can transfer part of the circle in a block move operation.)

The block move functions are powerful features. You can move a selected block on the screen, copy it, copy it upside down, or copy it mirrored from left to right. Selecting the area to be moved is much like outlining a box. Markers are placed at the two opposite ends. At this point if you don't like the size you can press START to begin anew. Then you move your joystick. A duplicate window and set of markers moves around the screen. Once you have chosen a new site, pressing the button completes the transfer.

There are a number of fill commands available. You can fill in areas in either the left, right, up, or down directions. The area will fill-in in the selected direction until a blocking or non-background pixel is encountered. The fill continues in the selected direction as you move your cursor along the other axis.

In case of a mistake there is a block zoom function that magnifies the pixels in a small area. Thus, individual pixels may be corrected. Correction is a slow process, but it gives you total control. Another feature lets you change the color of any section of the picture. This is a handy feature since all pixels are indirectly referenced by color registers. You should note that when colors change in one of the four color registers all existing pixels in that color will also change. This color swap feature swaps the color register references to the pixels in the specified block. Last but not least, text can be added anywhere on the screen in either small or large font.

Pictures can, of course, be saved to disk for use in another program or for later editing. A supplementary page of documentation gives several BASIC listing subroutines that will allow you to incorporate these pictures in your

programs. These lines change the display list, set the display list interrupts, and load the screens.

Fun With Art is one of the easiest to use and most useful programs available for both budding artists and those who need to design elaborate and professionally titled screens for use within their programs. It also has a great many features and the finest four-color resolution available in a graphics program today.

HEXABUG

Company: APX
Language: Machine
Hardware Requirements: 48K

Department: Utilities
Sugg. Retail: $39.95
Availability: 8
Disk or Tape: Disk

OVERALL RATING	**B+**	DOCUMENTATION	**B+**	RELIABILITY	**B**
EASE OF USE	**B**	VISUAL APPEAL	**A**	USEFULNESS	**B+**
VENDOR SUPPORT	**C**	ERROR HANDLING	**B+**	VALUE FOR MONEY	**B**

Hexabug is a debugger primarily designed for the Atari Macroassembler. Written as an Autorun.Sys file, it loads and initializes itself when you boot the program. In the process it resets the low and high memory pointers, reserving a permanent place in memory for itself throughout your debugging session.

You can call DOS with the Start key from *Hexabug*, load the routine you want to debug, and go back to DOS when finished to fetch another routine without losing your debugger. If your program is already set up with Autorun from DOS Option L., Binary Load, you will first have to place a breakpoint before the segment you want to work on. *Hexabug* will take over at the breakpoint. If the program is not set up with Autorun, you can reset the program counter to the appropriate segment of code.

This debugger offers a number of nice features, and is visually attractive as well. The screen divides into eight horizontal strips with a message and command line at the bottom. The top of the screen displays the 6502's registers with the status register broken into individual flag bits, each labeled. This far surpasses the common practice of representing the status register as a single byte in hex. Below this appear strips showing breakpoints, the stack page, the area in memory currently addressed by the program counter, and three independently addressable areas of memory. The standard Atari Control-arrow keys move you from field to field and to left or right within a field. In addition, you can scroll the strips devoted to stack, code, and memory in ascending or descending order, making each strip a scrolling window. Simply positioning the cursor and typing the new hex values modifies the program counter, breakpoints, and memory. You can display and modify memory in either ASCII or hex, useful when working with text and character tables.

Hexabug also supports the following functions: moving through the program line by line; continuing with or without preset breakpoints; bypassing good sections; and two DOS commands, one preserving *Hexabug* and the other aborting it. You can also search for a string of bytes, and scroll large areas in memory quickly to bypass tables and other data you don't want to wade through. You can toggle between your program's screen display and *Hexabug*'s with the Select key and turn off *Hexabug*'s smooth scrolling feature if your own program requires the use of HSCROL. *Hexabug* will also disassemble the code strip.

All of these are powerful features, and many programmers will choose *Hexabug* as the debugger of choice. This power does require certain trade-offs, however. For one thing, *Hexabug* is not relocatable. Because it occupies memory from $9000 to $C000, if you have a program designed for a 48K machine you will have to relocate those segments of code while debugging. *Hexabug* also uses page zero from $80-$9A. Moreover, you cannot define a symbol table, so you cannot use labels. Most of the time you will not find these restrictions prohibitive, but they can cause occasional difficulties.

Hexabug does require familiarity with the op codes and system equates in their "pure" hexadecimal form rather than just the mnemonics and standard labels. You must modify programs in hex, although you can edit text and characters directly. Because it contains no mini-assembler, you cannot code LDA#$FF; for example, you must modify directly (A9 FF). The op codes differ for each addressing mode and there is no consistent pattern to them across modes, making modification a difficult task, particularly for a beginning machine language programmer or one accustomed to mnemonics and labels. You can mitigate this difficulty if you have a printer to keep your assembly listing nearby, and have a good table of op codes. If you are just beginning to explore Machine language, *Hexabug* may not help you. You might find it somewhat intimidating as your main debugger, even though convenient for modifying text, data, and characters.

On the other hand, people comfortable with 6502 op codes (especially those who have worked in Machine

language for years and on the earlier, more primitive systems) may well find *Hexabug* to be a real joy. Its power enables you to modify code and memory for RAM quickly and easily, if you know what you want to do. For such a programmer, *Hexabug* can become almost transparent in its ease of use as you scan up and down memory, changing what you will.

GTIA DRAW

Company: San-An Computer Products
Language: Machine
Hardware Requirements: 48K

Department: Utilities
Sugg. Retail: $49.95
Availability: 2
Disk or Tape: Cartridge

OVERALL RATING	C	DOCUMENTATION	C−	RELIABILITY	C
EASE OF USE	C	VISUAL APPEAL	A−	USEFULNESS	C
VENDOR SUPPORT	C+	ERROR HANDLING	D	VALUE FOR MONEY	D

GTIA Draw is designed for those who want to draw pictures, graphs, and charts using the Atari's graphic capabilities, but who do not want to learn all the drawing commands in BASIC. Graphics programs created with this program can be loaded and saved onto a cassette or disk using standard DOS.

You have three graphics modes to choose from—9,10, and 11. These modes have the same characteristics and function the same way as they do in Atari BASIC. Plotting, drawing, and set-color modes also add to the program's capabilities. The most common way to draw images on the screen is to move the cursor with the joystick and press the fire button as the cursor moves. The character mode enables you to draw characters or redefine them.

The documentation is a problem. It is nothing more than a reference book, and does not contain clear, step-by-step instructions. The only way to learn how to use the program effectively is through experimentation. (Ironically, the time spent in experimenting with this program could be better spent learning how to draw in BASIC.) In addition, the large number of commands in the program are sometimes confusing. Fortunately, the designers have included a mailing address for those who have any questions about the program.

A more serious problem is that the graphics created with *GTIA Draw* cannot become part of a BASIC program. They merely stand by themselves. This is fine for those who simply want to create graphs and charts. But for those who want to write BASIC programs with colorful graphics, *GTIA Draw* is a disappointment.

MEGAFONT

Company: Xlent Software
Language: BASIC
Hardware Requirements: 48K

Department: Utilities
Sugg. Retail: $19.95
Availability: 2
Disk or Tape: Disk

OVERALL RATING	A	DOCUMENTATION	A	RELIABILITY	A
EASE OF USE	A	VISUAL APPEAL	A	USEFULNESS	B
VENDOR SUPPORT	B−	ERROR HANDLING	A	VALUE FOR MONEY	A

MegaFont is a utility program which promises a lot and gives you even more. This utility allows you to convert a character set created with a set editor to a format that can be used with your printer. Several converted fonts are included on the disk, and they are fantastic. They include a standard, two cursive, three fancy, italic, Greek, and a computer-type font.

You can print text files with the special fonts and print program listings with the inverse and graphics characters and the redefined character sets. Finally, the program allows the dump of Graphics 7+ and 8 screens in quarter, half, or full page sizes to the printer in inverse or normal mode.

Obviously, *MegaFont* does what it sets out to do and is simple to use. It is a bit slow in the graphics dump mode, but the maximum time is eight minutes for a full page.

Before you think that nothing is wrong, I found that if you try to load a file that does not exist, you get a "File Not Found" on the screen which then locks up the computer and requires re-booting. The documentation is simple and short. There was, however, an oversight in the seven-page instruction booklet. Two paragraphs indicated the ability to print out in boldface or regular print, but there were no prompts within the program that allowed that decision to be made. The printers that can be used are the Prowriter, NEC, or Epson with Graftrax.

Overall, this program rates the highest praise for its simplicity associated with the complex task at hand. It is, indeed, a most useful program, and well worth the cost.

MAPMAKER

Company: APX
Language: BASIC
Hardware Requirements: 32K

Department: Utilities
Sugg. Retail: $24.95
Availability: 3
Disk or Tape: Disk

OVERALL RATING	C+	DOCUMENTATION	C+	RELIABILITY	B—
EASE OF USE	C—	VISUAL APPEAL	B	USEFULNESS	C—
VENDOR SUPPORT	C—	ERROR HANDLING	B—	VALUE FOR MONEY	B

Mapmaker is a valuable utility designed to create multi-screen scrolling maps similar to those used in games like *Eastern Front*. It uses custom character sets in Graphics Mode 2 only. This is an enlarged five-color (four colors plus the background) character mode that uses a set of only sixty-four characters. (A screen has twenty characters across and is twelve rows deep.)

Map sizes range from slightly larger than a full screen to a maximum of 128 characters horizontally, or 256 characters deep. Since the maximum screen memory available is only 8K in a 48K machine, the product of the horizontal and vertical dimensions cannot exceed 8,192. This still gives you an area of about thirty-four screens.

The program is primarily keyboard controlled, although cursor movement can also be controlled by joystick. The keyboard arrow keys will move the cursor around the screen window or around the off-screen portion of the map. The X and Y cursor coordinates appear at the lower left, and the screen can be smooth-scrolled by pressing the CTRL-arrow keys. The map is created one character at a time by first pressing the START-key followed by the selected character. While this method lets you use every character, including the Break, Return, Space, and the four arrow keys, it makes the creation of a large map extremely tedious. At the very least, one of the function keys should have been able to place you in the auto mode for a particular direction. I faced this same dilemma when designing an ANTIC 4 (multi-color) map editor over a year ago and managed to include many time-saving functions with the sacrifice of only the ESC-key.

The program does not include a character editor although one was apparently interfaced at an earlier time. The company recommends *Instedit* from APX, and I recommend Datasoft's *Graphic Generator*. You will really need one or the other because the only modified character set is that supplied on the disk. It includes mostly modified characters like rivers, seacoasts, trees, castles, mountains, tanks, infantry, and warships. This is great for designing war game maps, but little else.

Mapmaker is primarily for the programmer who designs games around maps. But designing colorful maps without being able to load your creation with a public domain loader is of little use. Therefore, a clever programmer might strip this program for its loader. A shortcoming is the absence of an option to design maps using ANTIC 4 characters, since about 80% of the games that have scrolling backgrounds use this mode. *Mapmaker* is a good supplementary tool, but while novice programmers may find the program fun to play with, advanced programmers will not find a great deal of practical value here.

MICROSOFT BASIC
CROSS—REFERENCE UTILITY

Company: APX
Language: Microsoft BASIC
Hardware Requirements: 40K

Department: Utilities
Sugg. Retail: $17.95
Availability: 8
Disk or Tape: Disk

OVERALL RATING	B	DOCUMENTATION	C—	RELIABILITY	B—
EASE OF USE	B—	VISUAL APPEAL	A	USEFULNESS	B+
VENDOR SUPPORT	C	ERROR HANDLING	C—	VALUE FOR MONEY	A

Because of the size and structure of Microsoft BASIC, when working in this language it often helps to break large programs into a number of smaller ones. These subprograms can either be called by a central executive routine or can call each other in sequence. Microsoft BASIC running on a 48K machine allows only about 20K for your program, less if the 850 is on-line. This equals about 12K less than is available with standard Atari BASIC. In spite of this, Microsoft BASIC far surpasses the 8K cartridge in power and provides the additional bonus of compatibility with other computers, many of which utilize a version of this language.

The natural solution to the problem of limited memory is to write a number of small programs rather than a single large one. Microsoft BASIC provides for this with excellent merge and chaining features. At the heart of this process

lies the ability to pass variables (with their values) from one program to the next through the COMMON function. But to do this successfully you must know which variables are used and where in the program to find them. *Microsoft BASIC Cross-Reference Utility* provides a list of all variables in a program, the line numbers where they occur, and a list of lines that refer to other lines, such as GOTO statements. It proves an invaluable tool to the Microsoft programmer.

Although easy to use once you get the hang of it, the program contains a number of bothersome flaws. These begin as soon as you try to load the first of the two programs comprising the utility. According to the manual, you should load the program as "D:MXREF." In fact, the program is stored on the disk as XREF. Once you've worked that one out, perhaps by calling DOS and rebooting Microsoft, another nasty surprise awaits. The utility actually consists of two programs, the first providing a title screen and requesting the file name to cross-reference, the device, and the file for output. This program then calls the main module, which does the actual work. Unfortunately, the operating instructions do not explain this. You must read the "Technical Discussion" at the end of the manual to find this information. The manual leads you to believe that once you have entered the file name, the program begins to search for that file. When I started, to keep from tying up my computer in a useless search of the program disk, I substituted my working disk before responding to the prompts. The program crashed—and crashed again until I determined the problem.

In addition to these annoyances, the program is touchy about device specifiers. If you enter a file name without "D:" or "D1:" preceding it, the program will crash, forcing you to reboot the title program. It also requires an output file specification other than "S:" (screen). If you have a printer, you will probably output to the printer anyway. If not, you must write a dummy file to disk.

Finally, the program runs slowly, being itself written in Microsoft BASIC. An 8K program takes from ten to fifteen minutes to cross-reference. As the program size increases, the time taken increases at a much greater rate.

In spite of these limitations, this utility does what it was designed to do and is easy to use once you have mastered its quirks. The price makes it a "must" for anyone seriously working in Microsoft BASIC.

MINI—DOS PLUS
Company: Innovative Design Software
Language: BASIC
Hardware Requirements: 24K

Department: Utilities
Sugg. Retail: $24.95
Availability: 5
Disk or Tape: Disk

OVERALL RATING	B	EASE OF USE	B—	ERROR HANDLING	B
EDUCATIONAL VALUE	B	DOCUMENTATION	B	RELIABILITY	B
VENDOR SUPPORT	B	VISUAL APPEAL	C	VALUE FOR MONEY	A—

The utility program *Mini-DOS Plus* helps you develop BASIC programs. With this program, you will never have to exit the program you are working on to run an independent utility or go to DOS. *Mini-DOS Plus* becomes part of the program you are working on. It features nine of the fifteen DOS functions: List Directory, Go to BASIC, Delete Files, Rename Files, Lock Files, Unlock Files, Format Disk, Binary Load, and Create MEM-SAV. These functions work about the same as those in DOS. The ten additional functions save time. One of these, the List Variables function, displays a list of all the variables used in the program. If you run out of variable names, you can use this function to purge unused or misspelled variables.

You can quickly delete blocks of lines with the Delete Lines function. Once you have completed (or nearly completed) your program, you can delete the *Mini-DOS* utility from the main program through the Delete *Mini-DOS* function.

I found two of the functions of particular interest: Four-Color GR.0 and Check Sounds. While in Four-Color GR.0, you can create striking, colorful graphic displays on a black background. You redefine character sets to display interesting shapes and colors with one touch of the CTRL key and a letter key. The disk contains an attractive demonstration of some of the possible designs. You can also experiment with sound effects while in the Check Sounds mode. Moving the joystick changes sound, volume, pitch, and distortion while their values appear on the screen.

Advanced programmers will appreciate the program's ability to convert hexadecimals to decimals and vice versa. *Mini-DOS Plus* can also give a hex-dump of any file on the disk, or display a hex-dump of any memory location.

Two minor weaknesses detract from this utility. It lacks the ability to re-number lines, and the documentation

lacks clarity. In fact, one of the short program listings contains a typographical error. However, if you study the documentation slowly and carefully, you will find it helpful. *Mini-DOS Plus* is a good program overall, and I recommend it.

THE PILL

Company: Computer Software Services
Language: Machine
Hardware Requirements: 48K

Department: Utilities
Sugg. Retail: $69.95
Availability: 5
Disk or Tape: Both

OVERALL RATING	**A−**	DOCUMENTATION	**B**	RELIABILITY	**A**
EASE OF USE	**A−**	VISUAL APPEAL	**N/A**	USEFULNESS	**B**
VENDOR SUPPORT	**B**	ERROR HANDLING	**C**	VALUE FOR MONEY	**A**

The Pill transfers cartridge programs onto a disk or cassette as a back-up. The manufacturer insists that the program works and lists a phone number for answering problems. Of course, the first thought that comes to mind with a program like this is the possibility of piracy. However, the designers included several features that make mass copying impractical. The package includes a small cartridge with a unique on/off switch, a double-sided disk, and a tiny piece of tubing. To use the program, you insert the tubing into the interlocking switch (the small hole on the right inside the open cartridge door on your computer). Do this cautiously, or you may find it impossible to close the door once you remove the tubing.

Transferring a cartridge program onto a disk involves several steps. First you boot side one of the program disk. Then you insert the cartridge to be transferred into the computer. Next you turn the disk to side two and press Return to save the program onto the disk. Once the program has been transferred, you turn off the computer and remove the original cartridge. You insert *The Pill* with the switch in the Off position, turn on the computer, boot side two of the disk, and type in the number of the program you want. Once the program has been loaded, you switch on *The Pill* cartridge, press the Return key, and the original cartridge program appears on the screen. This is not an easy or inexpensive process for potential pirates.

Although the documentation is generally clear, you must read it carefully. One small mistake means starting over. Numbering the steps and including illustrations (particularly for inserting the tubing into the interlocking switch) would have clarified things. You also need to exercise care not to lose the tubing, which is miniscule. The disk also includes two utilities—a memory test and a disk rpm speed test. Despite its minor weaknesses, I highly recommend this excellent piece of software.

SCREEN MAKER

Company: ICON Software
Language: BASIC
Hardware Requirements: 48K

Department: Utilities
Sugg. Retail: $34.95
Availability: 3
Disk or Tape: Disk

OVERALL RATING	**B**	DOCUMENTATION	**B**	RELIABILITY	**B**
EASE OF USE	**B**	VISUAL APPEAL	**C**	USEFULNESS	**B**
VENDOR SUPPORT	**C**	ERROR HANDLING	**C**	VALUE FOR MONEY	**A**

One of the major advantages of Atari computers is the versatility of their display hardware. One of their main disadvantages is that the operating system and most languages support only a fraction of this versatility. *Screen Maker* consists of an editor for setting up screen mode layouts; facilities for saving, loading, and printing the layouts; and a utility for creating subroutines to display the custom screens in a BASIC program.

The editor is fairly easy to use. One simply types in a mode number, then moves a cursor down the screen to the point at which the next graphics mode is to begin. This process is repeated until the desired arrangement of mode windows has been created. The editor automatically moves the cursor in increments of full mode lines, so there can be no problem of miscalculated numbers of scan lines in a given move window. Up to fifteen windows can be

created on any one screen, using any combination of modes 0 through 8. Unfortunately, the various Antic modes and three GTIA modes not supported by BASIC are also not supported by *Screen Maker*.

Testing a screen design is a simple process. A cursor controls the window to be tested. Printing is done directly from the keyboard, while drawing in graphics mode windows is done with a joystick. The cursor is too far to the left to be seen on screens with normal overscan. This can be a problem because the cursor is the only indication that the blank screen is ready to be tested. There are also some error trapping problems in the testing routines that can cause a system crash.

When the programmer has designed all the necessary screens for a program, *Screen Maker* automatically creates a subroutine to use the screens. Writing to a screen is very convenient. Simply set certain variables to values corresponding to the screen and window numbers, then call the subroutine. Printing or drawing is done in the normal manner. Screen RAM seems to be allocated for maximum convenience and minimum economy. These subroutines take up a lot of space (12K is not at all unusual if a Graphics 8 window is included).

The 17-page manual was obviously designed in the APX format, but it has been reduced to about half size (including the print). Everything you need to know is clearly explained. There is a detailed tutorial that is beautifully REMarked. If your BASIC program has RAM to spare and does not require modes other than 0 through 8, *Screen Maker* is worth its weight in gold; it will save you hours of setup and debugging of custom display lists.

STAT PLUS

Company: The Programmers Workshop
Language: BASIC
Hardware Requirements: 32K

Department: Utilities
Sugg. Retail: $49.95
Availability: 6
Disk or Tape: Disk

OVERALL RATING	C–	DOCUMENTATION	D	RELIABILITY	C
EASE OF USE	D+	VISUAL APPEAL	C	USEFULNESS	C–
VENDOR SUPPORT	C	ERROR HANDLING	C	VALUE FOR MONEY	C–

One of the classic applications of computers is the calculation of statistics. *Stat Plus* attempts to extend this traditional capability to Atari users. The package has modules to perform the following:

- —calculate mean, variance, and standard deviation
- —calculate probability using binomial, poisson, or normal distribution
- —check significance using t-test, Mann-Whitney U test, and chi-square test
- —do linear or multilinear regression analyses

An interaction menu allows you to use several statistical treatments on a given sample while the sample is still in RAM. Other convenient features allow storage and retrieval of samples from disk, editing and ranking of samples, and printing of samples or test results to the screen or to an optional printer. The choice of statistical tests, documentation examples, and references make it clear that *Stat Plus* is oriented toward psychological statistics.

The author obviously tried to make *Stat Plus* easy to use. Every input has some kind of prompt, and there are many on-screen instructions and error messages. Unfortunately, there are still many irritating little problems. The program diskette must be in the drive in order to return to the Main Menu; if it is not, the program is lost and the system must be rebooted. Printing is done either to the screen or the printer, but not to both. Since the package can handle up to twelve variables, some of the output is naturally too wide for a 40-column screen; the format chosen to represent this output on the screen is very hard to read. Graphical output would have been useful, especially for the regression analyses. Most of the error messages stay on the screen long enough to read, but a few of them flash by so quickly that I am not really sure they were error messages. One apparent bug gave me a "memory insufficient" message (on a 48K system) while working with a very small sample.

The most serious problem with using *Stat Plus* is in its documentation. While it is physically attractive and easy to read, the 32-page manual simply does not provide enough information to use the program effectively. Plenty of examples are provided, but the explanations stop short where the "answers" are given by the computer. Many of these answers have to be interpreted using tables found in statistics texts, but neither the program nor the manual gives any hint of this requirement. Ideally these tables should have been incorporated into the program, but failing that, they should have been printed in the manual along with an explanation of their use.

Stat Plus is a pretty good start on a psychology statistics package. Unfortunately, its usefulness will be seriously limited until the documentation (or better yet, the program) is modified to incorporate the tables needed to finish the calculations.

ENTERTAINMENT

ALPHA SHIELD

Company: Sirius Software
Language: Machine
Hardware Requirements: 16K

Department: Entertainment
Sugg. Retail: $39.95
Availability: 3
Disk or Tape: Cartridge

OVERALL RATING	D+	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	D	DOCUMENTATION	C-
CREATIVITY	D+	CHALLENGE	C-	HOLDS INTEREST?	D
GAME DEPTH	D+	GRAPHICS	D	VALUE FOR MONEY	F

   Sirius Software has a knack for translating their VCS cartridges to the Atari computer system, without improving game depth, graphics, or sound effects. As a result, their games look like mediocre VCS games—and usually are. *Alpha Shield* is no exception. In it you try to destroy a military base surrounded by a diamond-shaped Alpha Shield that expands and contracts as it rotates. Although you can shoot through several small gaps, you cannot do so fast enough to deplete the base's energy level (shown on a meter). Instead you sneak through the gap when the shield is fully expanded and blast the base before the shield contracts and crushes you.
   The base also has other defenses. As you advance in level, the base sends out ships to destroy you. Some wander aimlessly, but others home in on your position. Although not hard to destroy, the ships delay your attack long enough for the base to begin constructing an inner shield, making it more difficult to sneak past the rotating outer shield.
   Game play is shallow, but moderately interesting. The graphics and sound are poor even for a VCS cartridge. An asterisk portrays your ship, and colorful explosions flash on the screen. Sound effects border on raspy. The game, finally, hardly deserves an audience for the price.

ASTRON IX

Company: Cosmi
Language: Machine
Hardware Requirements: 16K

Department: Entertainment
Sugg. Retail: $5.95
Availability: 3
Disk or Tape: Tape

OVERALL RATING	B-	CONTROLLABILITY	C-	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	C+	DOCUMENTATION	B+
CREATIVITY	B-	CHALLENGE	B	HOLDS INTEREST?	C+
GAME DEPTH	B	GRAPHICS	C+	VALUE FOR MONEY	A

   Astron IX sends you on a rescue mission in the caverns beneath the planet Astron IX. Using a joystick-controlled Magnaprobe, you must find and rescue nine humans captured during previous expeditions. Joystick control proves tricky. If you hold the button too long, the ship accelerates rapidly. Since the ship floats, you must maneuver it slowly and carefully through the narrow chambers to avoid colliding with the walls, which causes loss of shield strength. Your ship has limited shield strength, fuel, and weapon capability. To restock shield energy and weapons, you must gather them from random locations usually guarded by aliens. Although the aliens don't shoot at you (at least on the first level), they damage your shields if you collide with them. You must also be careful not to destroy what you want to recover and to compensate for the reverse motion caused by shooting your weapons. To get fuel, you dock at one of the supply depots scattered throughout the caverns. You also transport recovered fuel cells and rescued humans to the depot. Docking requires precise thrusting and steering; undocking requires holding the button down while moving the ship away from the depot. You transfer items by moving the cursor over the item and pressing the button, moving the item, and pressing the button again to release it. The whole procedure confuses beginners, but it becomes natural with practice. The cavern doesn't scroll, but changes scenes as the ship exits one chamber and enters the next. Each enemy encountered looks different and possesses strength as detailed in a chart in the manual.
   Cosmi purchased *Astron IX* in a bankruptcy sale. Since the game requires complicated instructions and considerable practice, they decided to sell it cheaply. Unfortunately, the average consumer equates price with quality. *Astron IX* is a good rescue, shoot-'em-up game that requires more strategy than outright skill. It offers a definite challenge, and is worth far more than its price.

ANTI-SUB PATROL

Company: Roklan Corp.
Language: Atari BASIC
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: $29.95 (disk), $19.95 (cass.)
Availability: 3
Disk or Tape: Both

OVERALL RATING	D	CONTROLLABILITY	D+	ERROR HANDLING	N/A
GAME CONCEPT	C-	SKILL INVOLVED	C	DOCUMENTATION	B-
CREATIVITY	D	CHALLENGE	C	HOLDS INTEREST?	D
GAME DEPTH	D+	GRAPHICS	D+	VALUE FOR MONEY	C-

Anti-Sub Patrol makes you the captain of a destroyer in a search and destroy mission against a submarine. Using your sonar, you locate the submarine on the screen grid while avoiding mines and the torpedoes launched by the submarine. If you find yourself directly above the sub, you enter the attack scenario: drop a depth charge at the correct depth and destroy the sub.

This is not an easy game to play. During each turn, you have the choice of either moving or performing a sonar scan. Given the presence of mines, moving blind is a quick way to lose one of your three ships. A scan is equally risky, since the sub may detect your sonar and fire a torpedo at you. Expect to lose ship after ship without getting near your target.

The graphics are unimpressive, which is a surprise in a release from the publisher of *Wizard of War* and *Gorf*. The display consists of a matrix of blue ellipses, with a red ellipse for your position and a plus sign for the sighted position of the sub. Most other information is presented in text form.

Anti-Sub Patrol starts with a good concept. Unfortunately, the game is a big disappointment. The author appears to have confused frustration with challenge.

BLUE MAX

Company: Synapse Software
Language: Machine
Hardware Requirements: 16K cassette, 32K disk

Department: Entertainment
Sugg. Retail: $34.95
Availability: 8
Disk or Tape: Both

OVERALL RATING	A	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B+	SKILL INVOLVED	B	DOCUMENTATION	B
CREATIVITY	B+	CHALLENGE	A	HOLDS INTEREST?	A-
GAME DEPTH	B+	GRAPHICS	A	VALUE FOR MONEY	A-

Blue Max is a three-dimensional, diagonally scrolling, aerial combat game. The mission in this three-stage game is to destroy as much of the enemy's air force in aerial dogfights as possible while simultaneously blasting the enemy ground targets by bomb drops or low level strafing runs. Eventually, you will reach the city where you must bomb three specific ground targets to win.

Your aircraft is controlled by a joystick. For some strange reason the author has installed the controls backwards, but if you select reverse controls the game works well. That is, pull back on the stick to make the plane climb, and push forward on the stick to make the plane dive. The machine gun is activated with the trigger, and bombs are released by pushing the button while lowering altitude. An instrument panel displays airspeed, fuel, altitude, and the status of your plane's equipment. A letter flashes when a part is damaged. Likewise, a flashing asterisk indicates whether an enemy plane is above or below your craft, or approaching from forward or aft.

The plane takes off from a small landing field. It must reach 100 mph before lift-off or it will crash. Once in the air, your plane begins flying over enemy terrain which includes heavily fortified river anti-aircraft guns, some on moving barges. Your plane casts a shadow over the scrolling terrain below, giving a good visual indication of the plane's altitude and providing a useful bombsight. Wind plays a factor in this game, and falling bombs tend to drift. Some of the targets are marked with an X and offer more points. The plane's machine guns can be used to strafe at altitudes between twenty-one and twenty-five feet.

When you have scored 1,000 points the terrain begins to scroll over a roadway and the enemy's airfield. You can bomb their hangar and several planes parked beside the runway. Afterwards, the terrain begins to scroll back to the river. Only after you have achieved a score of 5,000 points does the terrain scroll over to the enemy's city. The objective here is to bomb three specially marked targets in the center of the city; you must fly down between the tall buildings to reach them.

The most thrilling part of *Blue Max* is the aerial dogfights. Planes approach either from the front or rear. You attempt to fly at the same altitude and line up your guns. Tackling a plane head-on is outright dangerous since you are more likely to collide with it than shoot it down. Planes coming up from the rear are easier to hit if you wait until they pass before blasting them with your machine gun. As your aircraft flies through heavy anti-aircraft flak, damage is likely to occur. Letter indicators advise you of damage sustained such as decreased maneuverability, leaking fuel, or damage to bomb gear or machine guns. When all four letters are lit the plane will crash.

The plane can be refueled and repaired at your airport. The computer alerts you when you approach an airport. Put down the landing gear, fly low, and land as close to the main building as possible. If you land too far up the runway, you will never manage to reach liftoff speed before reaching the end of the runway. You are also a sitting duck on the runway as enemy planes fly by overhead.

Blue Max is a very enjoyable game that gives you a realistic sensation of flying a bi-plane over three-dimensional, diagonally scrolling terrain. A challenging game, it takes some practice to avoid frustration. You only have one plane, so once you crash you have to start over. This game has great depth of play to hold interest for a long time.
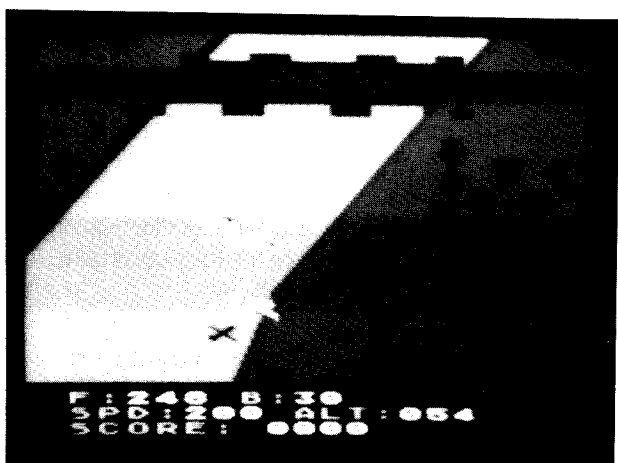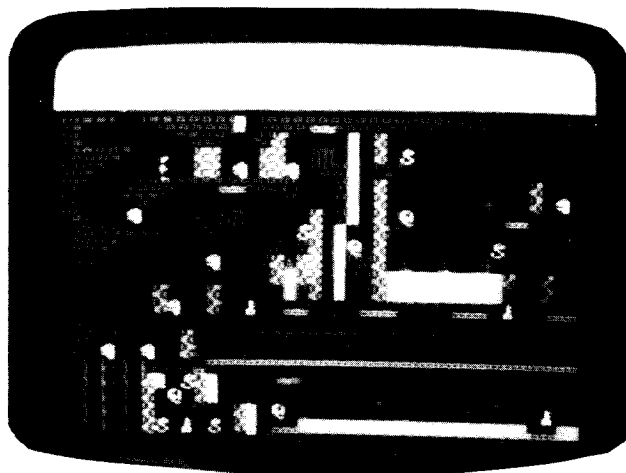
BLUE MAX   CAVERNS OF KHAFKA

BOULDERS AND BOMBS

Company: CBS Software
Language: Machine
Hardware Requirements: 16K

Department: Entertainment
Sugg. Retail: $39.95
Availability: 4
Disk or Tape: Cartridge

OVERALL RATING	D	CONTROLLABILITY	C	ERROR HANDLING	**N/A**
GAME CONCEPT	C−	SKILL INVOLVED	C−	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	C+	HOLDS INTEREST?	D
GAME DEPTH	D	GRAPHICS	C−	VALUE FOR MONEY	D

Boulders and Bombs, a digging game, requires you to get each of your three men across the screen by guiding them through tunnels dug by your joystick-guided auger (automatic digging machine). A number of rocks interfere with the digging, but you can plant bombs detonated by twisting your joystick clockwise in a circle. Hostile birds in the sky above prevent this game from getting too easy. They inject nuclear rods into your tunnels. The rods turn into fungus when they reach the tunnel and block your path. You select the spelunker or the auger by pressing the joystick, and your best bet is to quickly dig a tunnel and a bypass (to keep the spinning blades away from your man) and move a man or two across. This usually works only for a short time, forcing you to go back and clear the fungus-blocked tunnels or dig alternate passageways. The game moves faster if you have lost one or two men, but the only way to win is to wipe out the birds. To do this, you must plant a bomb just below a descending rod and detonate the bomb before the rod separates from the bird. At best, this gives you about one second of leeway, but if a rod hits your man, you lose him.

I did not find *Boulders and Bombs* very interesting. Getting those men across the boulder-cluttered screen seemed like pure drudgery. The time limit of one day and one night didn't really add much excitement. The graphics are decent, but simple. The game just isn't very exciting and can become frustrating, and I think most players will lose interest quickly.

CAVERNS OF KHAFKA

Company: Cosmi
Language: Machine
Hardware Requirements: 16K

Department: Entertainment
Sugg. Retail: $9.95 Tape, $14.95 Disk
Availability: 3
Disk or Tape: Both

OVERALL RATING	A-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	B+	DOCUMENTATION	B+
CREATIVITY	A-	CHALLENGE	A	HOLDS INTEREST?	A
GAME DEPTH	A-	GRAPHICS	B	VALUE FOR MONEY	A

Caverns of Khafka, a multi-screen scrolling treasure hunt, consists of four levels through which you search for the treasures of Pharoah Khafka. You try to reach them without getting lost in the many passageways or succumbing to acid pools, crushing walls, rolling boulders, or deadly bats. The game requires considerable dexterity as you run, duck, and jump your joystick-controlled character through the various passageways and chambers. Upper levels feature poisonous darts, killer bats, and monsters lurking on ladders. You can't kill most of them. The fourth level becomes dark, making it impossible to see some of the dangers, such as the deadly green bricks. This level offers the ultimate challenge.

A number of tricks help you survive your quest, but they take practice. A boat moves across the acid lake, but you must walk with it or die a horrible death. You need to duck constantly to avoid moving floors and walls, which requires timing. To find the secret passageways, you must duck or jump at them. You also need to remember that not all colored walls are harmless. Luckily, you become invincible for a brief period every time you collect ten of the treasures that you need to advance levels. While invincible, you can obtain the more unreachable treasures and kill the deadly bats. It is a good time to clear the passageways. Every twenty treasures, you get a free player. You'll need them.

The animated graphics are very good. Although the cavern remains the same from level to level, it becomes progressively more difficult to pass. You can't jump levels, but pressing Start lets you begin where you left off. Pressing Option starts the game over. You can reach all the treasures, although it takes hours of practice to master the game. I've seen players perform feats that look impossible. Only one thing interferes with the excellent design. The cavern includes two pits, one randomly filled with acid (offscreen). You must jump into one of the pits, which means that you stand a fifty percent chance of losing a man. The only redeeming feature is the fixed location of the acid pit. Otherwise, the design works well. It holds your interest so thoroughly that you may finally make it to level three or even four, and find out what a dark cave looks like.

CLIPPER

Company: Program Design, Inc.
Language: Atari BASIC
Hardware Requirements: 32K tape, 32K disk

Department: Entertainment
Sugg. Retail: $29.95
Availability: 5
Disk or Tape: Both

OVERALL RATING	C+	CONTROLLABILITY	B-	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	B	DOCUMENTATION	B
CREATIVITY	B	CHALLENGE	B	HOLDS INTEREST?	C
GAME DEPTH	B+	GRAPHICS	C-	VALUE FOR MONEY	B-

Clipper places you in command of a nineteenth-century sailing ship. Your objective is to travel from New York to San Francisco in the shortest possible time. You begin by selecting your vessel, deciding the weight of cargo you will carry, the number of crewmen you will command, and the provisions you will take.

Having loaded your ship, it is time to set sail. The screen displays your position (also available on a world map display), the ship's heading and speed, the wind direction and speed, and the amount of sail you are presenting to the wind. Aside from the mathematical problem of adjusting your heading to the direction of the wind, you must be aware of weather conditions, underwater hazards such as reefs, and morale problems with the crew.

One aspect of *Clipper* is sufficiently unusual to be worthy of mention. Both the disk and cassette versions make use of the cassette recorder during play. At various moments during the game a wise old sea captain will come on to tell of his experiences. Aside from the value of the information imparted by the captain, he adds an element of authenticity to this enterprise.

Clipper is a relatively slow-moving game and is not likely to appeal to those who are ruled by their reflexes. Its graphics are far from spectacular, and the response is as slow as one might expect from a BASIC program. Still, there is a place in the market for an innovative simulation game. For those who want an intellectual challenge, *Clipper* may be just the ticket.

COMBAT LEADER

Company: Strategic Simulations, Inc.
Language: BASIC
Hardware Requirements: 48K

Department: Entertainment
Sugg. Retail: $39.95
Availability: 10
Disk or Tape: Disk, Cassete

OVERALL RATING	B+	CONTROLLABILITY	B	ERROR HANDLING	A
GAME CONCEPT	A	SKILL INVOLVED	A	DOCUMENTATION	B+
CREATIVITY	A	CHALLENGE	A	HOLDS INTEREST?	A
GAME DEPTH	A	GRAPHICS	C+	VALUE FOR MONEY	B+

This tactical game simulates combat between tank and infantry companies on different battlefields. The game consists of variations allowing different levels of play. You command tanks, infantry, rifles, antitank weapons, and mortars against a computer controlled army on varying types of terrain.

The games are well thought out and provide a great deal of variety. The graphics are rather simple, however, and it is difficult to separate the men you command from the opposition since they all look like dark squares or "+" signs. In spite of these drawbacks, the game provides a good scrolling screen and excellent sound effects.

The novice game, which you should play awhile to get comfortable with the controls, pits a tank force of five against a hidden computer tank force of five. The next level, the intermediate game, pits a mechanized infantry platoon that you command against a similar platoon commanded by the computer. This game demands concentration, planning, and a lot of replaying to reach your objective of destroying the enemy.

After these levels, other games are available which let you plan reconnaissance, mobilize defense, seize and hold objectives, and launch attack and destroy missions. If that isn't enough, you can change the playing conditions to create a large variety of games with different terrain and different mixes of forces employed.

A nineteen page manual explains the game fully and also contains a good deal of military theory. In spite of the drawbacks, the game is addicting because of the great variety of commands at your disposal, the need to check for updated messages as to where the enemy has been spotted, your ability to change from a company commander to a platoon or squad leader to meet varying situations, and so on. The list of orders includes fire, cease fire, mount and dismount, lay down smoke screens, and increase speed of infantry squads.

COMPUTER WAR

Company: Thorn EMI
Language: Machine
Hardware Requirements: 16K

Department: Entertainment
Sugg. Retail: $39.95
Availability: 7
Disk or Tape: Cartridge

OVERALL RATING	C+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C−	DOCUMENTATION	C
CREATIVITY	C−	CHALLENGE	C	HOLDS INTEREST?	C+
GAME DEPTH	C	GRAPHICS	B	VALUE FOR MONEY	C

In *Computer War*, obviously based on the movie *War Games*, the computer at NORAD has detected a cluster of attacking missiles and has begun to prepare a counter-attack. You discover that the computer is actually playing a simulation, but to stop its real counter-attack, you must knock out the incoming missiles in the computer's memory bank and crack a code so that you can shut down the alerted missile bases.

You begin with a large display of the North American continent showing NORAD and four missile bases. The system currently is in DEFCON 5, a state of peace. Suddenly, missile blips appear on the screen. You move your joystick-controlled cursor to cover one of the blips and engage it in mock combat by pressing the fire button. The

view zooms into the combat area and you track the missile manually through landscape stored in the computer's memory bank. You have a limited amount of time to find and destroy the missile. A marker on one side of the screen indicates its direction, and a pulsing sound tells you when you are getting close. If you fail to shoot down the missile with your lasers, one of the bases goes on alert and the system drops one DEFCON stage. If too many missiles get past you, you may well find yourself on the way to nuclear war. If you do stop the missile, you return to the war and try to stop another. When you have destroyed all of them, you still face the problem of stopping the computer from launching a strike. To do so, match the pattern of steady lights among the blinking ones at the top of the screen. Once you match the pattern, move to the most vulnerable base on the map and deactivate it. The map restructures to begin anew with more bases to protect.

The graphics in this game are good, the display map detailed and realistic. I particularly liked the battle sequences in which the hunt for the missile begins slightly offshore and approaches land.

While the scenario is interesting, the game basically belongs to the arcade game. You find and shoot down an incoming missile that tries to elude you. If you are a good shot, you can temporarily stop the threat of war, but the game moves on to a harder level. It lacks tension and excitement, perhaps because it tries to teach you that a nuclear war cannot be won.

COSMIC TUNNELS
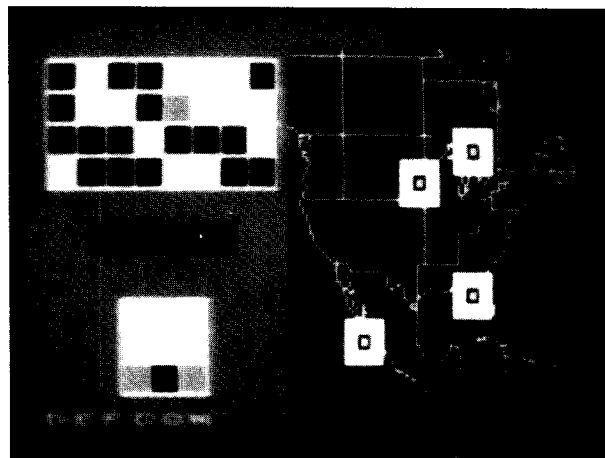
COMPUTER WAR

COSMIC TUNNELS
Company: Datamost
Language: Machine
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: $34.95
Availability: 6
Disk or Tape: Disk*

OVERALL RATING	B	CONTROLLABILITY	B−	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	B	CHALLENGE	C	HOLDS INTEREST?	B
GAME DEPTH	B−	GRAPHICS	B−	VALUE FOR MONEY	B−

In *Cosmic Tunnels* you try to break an energy embargo imposed by your arch enemies, the Jebs. To do this, you must retrieve sixteen precious energy bars located on four neighboring asteroids. These bars power a generating complex on your moon. To reach the asteroids, you must guide your spaceship through a meteor shower. If a meteor hits you, it depletes your ship of energy. You are safe from the meteors once you reach the gate to one of the four warp tunnels, but inside the tunnel you face space mines. If you hit one, your ship loses more energy. They take little effort to destroy, however, since you need only line up your ship, the mine, and the end of the tunnel to destroy a mine. The warp lasts twenty-five seconds.

Upon exiting the tunnel, you must attempt to land on an asteroid. The enemy defense system consists of bases and missile systems, which you can destroy by dropping bombs. You must dodge enemy fire and destroy all of the bases before you can reenter the tunnel and return home. The landing pads are in the open except on one asteroid, where it lies beneath a heavily fortified ledge. Once you land, one of your three astronauts must retrieve the four gold energy bars at the bottom of the screen. During this attempt, you must avoid Space Turkeys, Dynobots, Electric Lizards, or

Monstrous Munchers that patrol the asteroids. You can't shoot them, but rocks offer some safety. Pressing the button allows faster movement. Moving the astronaut to the Jetcopter or Rocket Springs launch pads lets you launch him like Superman (using the Rocket Springs) or keep him hovering for a short time (using the Jetcopter). He retrieves the bars one at a time. When he has completed his task, your pilot, Captain Sticky, is ready to head back to the moon base through the warp tunnel. You continue to the rest of the asteroids until you recover all sixteen energy bars or run out of energy.

The four separate screens give enough variety to the game to make it fun and interesting. The graphics are good. The music that plays during the title and high score screens is original. Although not overly difficult, the game is not easy to win.

DEADLINE

Company: Infocom, Inc.
Language: Assembly
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: $49.95
Availability: 9
Disk or Tape: Disk*

OVERALL RATING	A	CONTROLLABILITY	B	ERROR HANDLING	B
GAME CONCEPT	A	SKILL INVOLVED	A	DOCUMENTATION	A
CREATIVITY	A	CHALLENGE	A–	HOLDS INTEREST?	A
GAME DEPTH	A	GRAPHICS	N/A	VALUE FOR MONEY	A

Deadline is the first in a series of all-text mystery adventure games from the *Zork* bunch. Totally engrossing, you are seemingly pulled directly through the CRT, and right into the mansion with the suspects. You, as the Detective, are called upon to investigate the apparent suicide of a wealthy and philanthropic industrialist. There are no monsters, treasures, mazes, .wizards, or magicians; just seven characters in a house having some forty-eight mappable locations. Sounds simple? Guess again! There are several tricky puzzles, a very involved plot, an abundance of well-written text, characters moving independently of one another (and of you), a second suicide/-homicide of one of the characters (under certain conditions), and the possibility of twenty-five different endings, including your own early demise.

Like any good mystery, *Deadline* unravels slowly, and is complete with false leads and subplots. You have twelve hours to establish your case and resolve the conflicting issues. Don't try to do it all in the first hour; events transpire at specific times which will alter your suspicions or influence your investigation. Because of these events, a complete solution is not possible until early in the afternoon, even if you know exactly what needs to be done. Physical evidence, also time dependent, is hard to come by, despite a multitude of objects.

Regardless of which of four principal suspects you attempt to convict, it is necessary to prove the motive, opportunity, and means. When you believe you have enough proof, you may arrest your suspect(s). A summary letter advises you of the result, ranging from dismissal by the Grand Jury, to conviction by the Trial Jury. Some endings come with shocking suddenness, while others are quite a surprise or contain a strange twist or clue for your next attempt. While some are simply variations of others, there is one "complete" solution, distinguished by a three-screen analysis of the crime by the author.

The game suggests the quality, feel, and humor of its *Zork* predecessors, from which *Deadline*'s flexible, multiple command parser has been adapted. The vocabulary and synonomous word recognitions are excellent, although there are a few "missing" words which a good detective would use; for example, Who, Why, When, and Where. Then, too, there is a fast sequence of events near one ending that is illogical. Lastly, there is an obscure but fatal bug—don't shake a bottle known to be empty unless you have made use of the save/restore game feature.

The response time of the game is excellent, and the disk-interactive nature of the game is hardly noticed. *Deadline* will play on a 32K system, run faster on a 48K system, and really zip on a 64K configuration. While the puzzle quality and difficulty level are moderate, the puzzles are quite involved and interactive, requiring more deductive logic than is usually called for in adventures. After seeing the many screens of possible responses and descriptions, perhaps the biggest single puzzle is, how did Infocom manage to get all that text onto one disk?

THE DARK CRYSTAL

Company: Sierra On-Line Systems
Language: Assembly
Hardware Requirements: 48K

Department: Entertainment
Sugg. Retail: $39.95
Availability: 8
Disk or Tape: Disk

OVERALL RATING	A−	DIFFICULTY	C	ORIGINALITY	A
PUZZLE QUALITY	B	EASE OF USE	C−	DOCUMENTATION	B
TEXT QUALITY	B+	VOCABULARY	B	HOLDS INTEREST?	A
GRAPHICS QUALITY	B−	SAVE/RESTORE	C	VALUE FOR MONEY	A

The Dark Crystal is a two disk Hi-Res fantasy adventure, the sixth from On-Line and Roberta Williams. The game is based on, and generally faithful to, the movie produced by Jim Henson of Muppet fame, who also wrote the story. The plot is exceptional, but having seen the movie is neither a help nor a hindrance in solving the game.

Jen, our Gelfling hero, is your alter ego. You control his actions in his quest to find and replace the missing shard of the Great Crystal, a deed which must be done at the instant of the triple conjunction of the Three Suns. The great prophecy states that only a Gelfling can accomplish this task, and Jen is one of only two who escaped the slaughter of his race by the evil Skeksis. Failure means that the Skeksis and their robot-like killers, the Garthim, will control their world forever. Success means both the end of the Skeksis rule and a return to peaceful harmony in the world of the Gelfling and Pod people. If he succeeds, Jen will live happily ever after with Kira, the female Gelfling, whom he meets halfway through the game.

The game's disk-interactive graphics, which employ two novel and exciting techniques, are good but not overwhelming. In the beginning, Jen appears a bit too often. In each frame, he is the starkly white character against the colorful, detailed background. Later, after Kira is found, she and Jen neatly overlay the same backgrounds that he had previously traveled alone. Other figures, also all white (presumably due to the overlay requirements), can also occupy the same backgrounds with Jen and Kira on certain occasions. Despite the large game area, mapping, while recommended, is not mandatory. There are no tricks or mazes in the regular, symmetrical layout. There are approximately ninety-four mappable locations at which actions are possible. Also, about a dozen scenes, which automatically appear as a consequence of a previous action, serve as intermediates to the next location. This technique adds materially to both the flow of the story and the fast-action, "animated movie" feeling that comes through in the later phases of the game.

Some liberties had to be taken regarding the movie in order to improve the game's puzzles, which, while not particularly interactive or difficult, demand that you read the text very carefully and use a degree of imagination normally only demanded by an all-text adventure. Some objects and actions are neatly concealed. While you are not too likely to get killed off in the first half of the game, matters get stickier and more dangerous later on. Often only one move is permitted before unfortunate consequences take place.

The syntax permits only two words, but the need for involved expression is not necessary. Similarly, the vocabulary is quite adequate and has good synonym recognition. Only in one spot—toward the end of the game, where several minor glitches are found—is specific word usage a problem (try "Use Hook"). Fifteen different Save-game positions may be made to a scratch disk, which must be initialized from the game disk. While a game may be recalled at any time, it is necessary to reinsert Disk 1B if you get killed off. Combined with the sudden demand to insert another game side, there are often five disk sides with which to contend in a disk-flipping nightmare. This program is sophisticated in many ways; it's too bad that On-Line hasn't learned how easy it would be to optionally permit two drives to be used.

The Dark Crystal has little deliberate humor, but it's lighthearted, done in good taste, and fun to play. The game anticipates your actions and commands unusually well. Quite a number of descriptive responses to the hardest things add materially to making the game playable and interesting, although they have little bearing on the game's solution. The game is easy enough for beginners and captivating enough for more experienced adventurers. Despite a few rough edges, it is one of the best Hi-Res adventures to come along for some time.

DRELBS

Company: Synapse Software
Language: Machine
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: $34.95
Availability: 7
Disk or Tape: Disk*

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	B-	DOCUMENTATION	B-
CREATIVITY	B+	CHALLENGE	B-	HOLDS INTEREST?	B-
GAME DEPTH	B-	GRAPHICS	B-	VALUE FOR MONEY	B-

Drelbs took a vivid imagination to create. In this game you try to defeat the evil Trollaboars who have imprisoned your land (represented by an atomic flip grid). To defeat them, you hop around the grid flipping gates (ninety degrees each move) to form squares. A loose destroyer Trollaboar moves around the grid destroying the squares that you build. His touch is lethal, but you can briefly imprison him in a square.

Screwhead Tanks patrol the perimeter of the grid, firing bullets that ricochet off the gates. I hardly consider them dangerous; few of their bullets have ever made a direct hit. Grogolytes that occasionally appear in the windows of your completed squares offer little threat. While they can't harm you, they do eventually release the square. If a lady Drelbish prisoner appears in a window, you gain bonus points if you succeed in jumping into the window while she is still there. In addition, a heart-shaped figure momentarily freezes the Trollaboars.

Eventually, you complete the squares and jump through the Drelbish window to free your people held prisoner in the Dark Corridor. Your only other means of passage is to catch the magic diamond that occasionally appears; it opens the window for you. Once in the Dark Corridor, you must work quickly to free every Drelb that you touch. The Trollaboars feel your presence and hunt you relentlessly until they throw you back into the grid. It is their cousins, the Gorgolytes, who act as slavemasters in the Dark Corridor.

Drelbs is imaginative and challenging. Random motion will not help you complete the blocks in the grid, so you must use careful strategy to win. Once I understood the game's concept and rules, I found it very playable.

EVEREST EXPLORER

Company: Acorn Software Products
Language: Atari BASIC
Hardware Requirements: 40K

Department: Entertainment
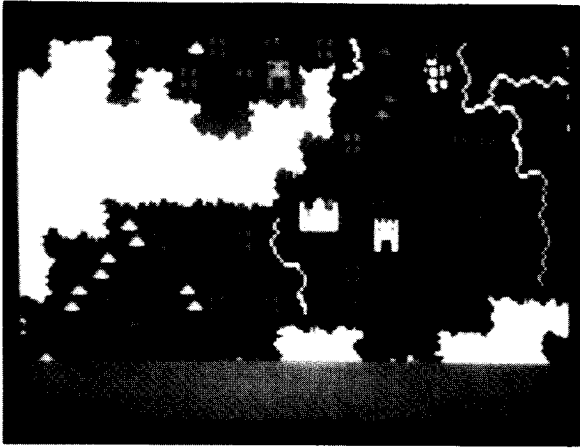**Sugg. Retail:** $19.95
Availability: 7
Disk or Tape: Disk

OVERALL RATING	D+	CONTROLLABILITY	C-	ERROR HANDLING	N/A
GAME CONCEPT	C+	SKILL INVOLVED	B	DOCUMENTATION	B-
CREATIVITY	C-	CHALLENGE	B+	HOLDS INTEREST?	D+
GAME DEPTH	C	GRAPHICS	D+	VALUE FOR MONEY	D+

Everest Explorer places the player in the middle of a climb up the tallest mountain in the world, Mt. Everest. Imagine yourself battling nature at its most savage in this primal challenge of man against his environment.

Keep imagining. *Everest Explorer* does not simulate a mountain climb. Instead, it simulates the logistics of a climb: the number of climbers and Sherpas, their equipment, and each individual's assignments. You must decide on the number of tents, oxygen tanks, and quantity of food and fuel to carry, as well as how to apportion them among the various camps set up along the climb route.

This program is available in versions for a number of different computers. As a result, it does not take advantage of a specific computer's unique capabilities. Don't expect graphics or sound in this game. It does make use of a joystick or paddle for most data entry requests, with the keyboard used for the remaining inputs. The use of joystick/paddle only serves to complicate data input.

As with *Lost Colony*, *Everest Explorer* is likely to appeal to a limited subset of computer gamers. Those who enjoy juggling large numbers of variables (and who don't get enough of that sort of thing at work) may get a sense of satisfaction out of this game. The rest may want to skip it.

EXCALIBUR

EXCALIBUR

EXCALIBUR
Company: APX
Language: Machine
Hardware Requirements: 48K

Department: Entertainment
Sugg. Retail: $29.95
Availability: 7
Disk or Tape: Disk

OVERALL RATING	A	CONTROLLABILITY	A–	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	A	DOCUMENTATION	B+
CREATIVITY	A–	CHALLENGE	A–	HOLDS INTEREST?	B+
GAME DEPTH	A	GRAPHICS	B	VALUE FOR MONEY	A–

The brightly glowing sword rising slowly out of the water on the title page sets the scene for the adventure-war game *Excalibur*. It transports you back to the days of Arthurian legend and the small kingdom called Camelot. Here Arthur forged a new kingdom, with the aid of Merlin the magician and the prowess of the knights of the Round Table.

Chris Crawford and his staff of programmers at Atari's Games Research spent twenty months developing this mammoth game, perhaps the largest ever designed for the Atari computer. For you to play the interconnected segments of the game, you must constantly reload disk files. The object is to unite Britain. This task proves difficult because Camelot, a small kingdom, has few knights to aid in the conquest. In addition, rival kingdoms with power-hungry kings surround it. Arthur must bide his time, meanwhile raising and training an army both for defense and offense. To achieve his objective requires diplomacy rather than fighting, lest he weaken his meager forces further in profitless combat. Instead he makes alliances, demanding tribute for protection. To accomplish this, he must first prove to the lesser kings that he can defeat them in battle. Solving this problem requires subtlety and experience. Luckily, he has the aid of his knights and Merlin. Merlin is both powerful and loyal, but the knights less so. Watch where they stand in the throne room. Loyal warriors stand close to the throne. Some can be influenced by gifts or honors, and may flee to save themselves in battle rather than fighting for their king. Merlin, however, uses his magic to help Arthur. But the more he uses his power, the weaker it becomes, and this limits his ability. He has constructed a map room for the king that shows all of the British kingdoms and reveals enemies and news. All magic takes place in his own room. There he can cast a plague on an enemy's army, or pestilence on a rival's crops, weakening them in their opposition to Arthur. From here he can invisibly transport Arthur to another king's castle to spy on the treasury (to determine the enemy's wealth), the throne room (to tally the power of the king's knights), or the map room (to gauge the king's feelings towards Camelot or another kingdom).

Arthur's own treasury room marks the location of all financial decisions, such as raising taxes and spending money to raise an army. Here he keeps records of tribute paid to him or that he must pay. One column in the records lists the actual values, while a second lists projections (subject to change by joystick control).

If Arthur decides to battle a neighbor, he goes to the map room and declares war on that kingdom, which then turns red on the map. Green signifies neutrality. Next, Arthur moves to the Round Table Room and chooses knights

to help him fight. Each knight brings along the peasants that he has trained as soldiers. Arthur should leave at least one knight behind to defend the kingdom. When he exits the throne room, he enters the countryside outside the castle. The computer pauses here to load a large, scrolling map that shows the entire island of Britain, its rivers, seas, castles, and farmland. Arthur and his small band of knights march cross-country to the enemy king's land and begin to pillage his crops. If the enemy king decides to fight, a sword appears in challenge. The computer now pauses to load the battle portion of the game, which resembles Crawford's *Legionnaire* war game. Two rows of knights face each other on the field, each designated by a shield (one of which spells Crawford's name backwards). Moving the cursor to a knight reveals his name and the number of soldiers with him. You give commands by moving the cursor to a knight, pressing the button, and repositioning the cursor to where you want the knight. The battle can become quite dynamic, with new orders given constantly as the battle progresses. When the knights meet, they flash and you hear clanging sounds. Strength, courage, and tactics determine the outcome. The novice relying on weaker forces often loses the first battle and thus the game.

The game's graphics vary widely. The castle rooms are plain yet informative, but Merlin's room is superbly rendered. Images there sparkle and fade magically. The scrolling map of Britain employs wonderful detail and color, but the battle scenes show only the shields to represent knights.

Excalibur is destined to become a cult game. A highly complex game of strategy, it requires hours, sometimes tens of hours to play. Fortunately, it has a Save-game option. It appeals mainly to the seasoned wargamer or fantasy role-player. Although slow, it holds your interest over an extended time once you have mastered some of the basic elements of play. It requires patience and restraint, certainly, and the novice will need to exercise them to avoid losing the game quickly and becoming discouraged. The level of difficulty alone may discourage many beginners, but those who persevere will find an ample reward in the game's incredible depth.

GATEWAY TO APSHAI

Company: EPYX
Language: Machine
Hardware Requirements: 16K

Department: Entertainment
Sugg. Retail: $40.00
Availability: 6
Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B+	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	B	CHALLENGE	B	HOLDS INTEREST?	B
GAME DEPTH	B−	GRAPHICS	B	VALUE FOR MONEY	B−

Gateway to Apshai fits the arcade style of fantasy role-playing more than its sister product, *Temple of Apshai*. The game takes place in real time with a joystick-controlled hero, thus progressing faster. You gather treasure in a multi-level dungeon filled with traps and monsters. The game presents a choice of sixteen different, huge dungeons containing seventy rooms on each of eight levels. You have six and a half minutes to explore each level. If you finish in time, you teleport to the next level which is deeper and harder. The game ends when you have completed all eight levels—or have exhausted your eight lives. Luckily, your hero is endowed with strength, agility, luck, and health. The computer awards you bonus points if you fight well and complete a level under the time limit. Watch your health as death occurs if that value falls to zero, although sometimes you find healing salve to restore your health.

You play the game using a joystick and three function keys. The Option key lets you use items in your bag, for example, a key to unlock doors. The Select key lets you search a room for a secret door or trap, drop an item, move to the next level, or check your status. The Start key puts you in the fight mode. You begin with a dagger, but soon obtain a bow, arrows, and a short sword. You switch between weapons by repeating the fight mode command.

As you begin your search, the unexplored areas are hidden. When you move into a room, its contents and walls become visible. Sometimes bats, snakes, ghouls, and slime mold protect the treasure. Most you can kill with a sword thrust, but it is safer to kill them from afar with an arrow. Draw your weapon quickly, as a monster may lurk nearby. Treasures and other items, like healing potions and spells, are easily acquired and with little regard for traps—they seem to have little effect.

Although *Gateway to Apshai* is an introduction to the more difficult fantasy role-playing games like *Temple of Apshai*, I found it a better game in many ways. First, it moves faster and holds your attention longer. Second, it eliminates many of the keyboard commands that prove so frustrating to children. Yet the game retains much of the flavor that made the original series popular. Finally, the cartridge form makes it available to owners of Atari 400 and 600XL computers.

GRIDIRON GLORY

Company: APX
Language: BASIC
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: $24.95
Availability: 5
Disk or Tape: Disk

OVERALL RATING	B	CONTROLLABILITY	B−	ERROR HANDLING	N/A
GAME CONCEPT	B+	SKILL INVOLVED	B	DOCUMENTATION	B−
CREATIVITY	B+	CHALLENGE	B	HOLDS INTEREST?	B
GAME DEPTH	B	GRAPHICS	B−	VALUE FOR MONEY	B+

Gridiron Glory, a very exciting football game simulation, makes you the coach of any of the NFL football teams. Each team is power ranked for passing, rushing, offense, and defense. Even though the game is written in BASIC, it moves fast. A twenty-five second clock forces rapid play selection and makes for a much more realistic game. *Gridiron* also sports a regular game clock which divides the eight-minute quarters. You even get time-outs and a two-minute warning.

I was impressed by the realistic play features of this game, including referees to call the penalties (you have to constantly watch the referee to learn the outcome of a play), and a statistics counter which keeps track of all yards and points, just like Monday Night Football.

You control your team using different joystick positions and some keyboard commands. The instructions clearly explain the different play and joystick combinations. Some study is required to become familiar with the correct joystick positions. I still play with the instructions opened for reference.

Gridiron Glory also has other good things, like a roaring crowd sound effect when a touchdown is scored. When a game is close, the fourth quarter can really get wild. You will enjoy this game, especially when you are playing against a rookie coach. Here is a tip. Get him or her to coach Baltimore or New Orleans. You take San Francisco.

GWENDOLYN

Company: Artwork
Language: BASIC
Hardware Requirements: 48K

Department: Entertainment
Sugg. Retail: $27.95
Availability: 8
Disk or Tape: Disk

OVERALL RATING	D	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	F	DOCUMENTATION	B
CREATIVITY	C−	CHALLENGE	F	HOLDS INTEREST?	F
GAME DEPTH	D	GRAPHICS	C	VALUE FOR MONEY	F

Gwendolyn is a single-player graphic adventure program by the author of *Crypt of the Undead* and *King Arthur's Heir*. In this game, you are Prince Maracus, whose bride-to-be, Princess Gwendolyn, has been abducted by an army of dwarves. You must search through the caverns beneath your kingdom and rescue the lady from her captors.

At each point during the game, you are presented with a picture of your location, along with the compass directions in which you may move. You push your joystick in the desired direction and press the fire button to move, at which point a picture of the next location appears. Pressing the fire button without moving the joystick calls up a menu of additional functions. These include picking up objects, using these objects, getting an inventory, saving the game, and displaying your score. This last function serves no particular purpose, because you get no hint of what this score means.

The instructions mention some of the objects to be found along the way, along with their peculiar functions. This is important, since using an object outside of the room where you should use it will cause it to explode. This is the only obstacle in the game, other than the effort of mapping the caverns. You cannot lose this game except by destroying a needed object. (In testing this game, I simply saved the game before trying objects. If I chose the wrong object, I could then restart at that point, thereby not wasting any time.)

None of the problems presented in *Gwendolyn* proved even mildly difficult. As with his previous games, the author has provided clues so obvious as to insult the intelligence of his audience. Assuming that you keep a reasonably accurate map as you go along, the entire game can be played in under two hours, unless boredom reaches you before you reach the princess.

GRIDRUNNER

Company: HES
Language: Machine
Hardware Requirements: 16K

OVERALL RATING	D	CONTROLLABILITY	C–	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	D	CHALLENGE	C+	HOLDS INTEREST?	D
GAME DEPTH	D	GRAPHICS	D	VALUE FOR MONEY	D

Gridrunner, a translation of a popular and fast-moving VIC-20 shoot-'em-up game, resembles *Centipede* except that you are trapped on a grid and must battle the caterpillar while X and Y Zappers shoot at you as they run across the bottom of the screen. If you knock off the caterpillar's parts one at a time, you have a chance. If you split them, you've got trouble. A further hindrance comes from the pods that impede your movement along the grid.

Although action packed, *Gridrunner* is crude in play mechanics and graphics and has virtually no depth of play. While it was a good game for the VIC-20, it should have remained there.

HARD HAT MACK

Company: Electronic Arts
Language: Machine
Hardware Requirements: 48K

OVERALL RATING	B+	CONTROLLABILITY	B+	ERROR HANDLING	N/A
GAME CONCEPT	B+	SKILL INVOLVED	B–	DOCUMENTATION	C+
CREATIVITY	B	CHALLENGE	B+	HOLDS INTEREST?	B
GAME DEPTH	B	GRAPHICS	B	VALUE FOR MONEY	B

Hard Hat Mack is a jumping, climbing arcade game in which our hero tries to construct a building while avoiding the OSHA inspector, falling rivets, and other construction hazards. There are only three screens in this joystick or keyboard-controlled arcade game.

The first screen shows an unfinished five-story building. You must first place girders into the holes in the framework. Having done this, you must rivet them into place with the rivet gun, which you have to chase to catch. All this is extraordinarily difficult because the OSHA inspector is chasing you, and deadly rivets are constantly falling around you. You can travel between floors by climbing the chains, riding the elevator, or jumping on the springboard on the left side of the screen. If you don't rivet the girders in place before you die, you have to put them in again with your next man.

The second screen is a little easier and has more interesting graphics. The object is to collect all the toolboxes scattered around the many uncompleted floors of the building. A girder on the hoist will move you from floor to floor. Several of the toolboxes are easy to get. Nevertheless, you must time yourself carefully when you leap past an opening and closing contraption and sneak past the inspector, who is standing guard on the street level. Once you have gotten all the toolboxes, you have to time your ride to the top so that the big magnet will pick you up and transport you safely past the last conveyor belt.

Your mission on the third screen is to grab all the steel blocks that are scattered about the five-story structure and put them into the rivet machine. This is not at all easy because there is an abyss between the right and left sides of the building. You must cross over this chasm by carefully falling onto the twin springboards. There is also an elevator-type conveyor that can transport you up and over the top, but not around the bottom. It sits dangerously over the chemical toilet. Adding to the danger are the exposed wires on one of the conveyor belts and the riveting machine itself.

You need a long period of time to master this game. "Master" perhaps isn't the right word because the objects that you collect are placed at random during each game. However, you can learn the technique of finishing each level. The three screens, though a real challenge, are not enough. The first screen is the most frustrating, difficult, and least interesting. You can start the game on other screens if you press the number 2 or 3 before you press the joystick button to start. The animated graphics and the game design are top notch. *Hard Hat Mack* is definitely an arcade game that will challenge the best of players.

IN SEARCH OF THE
MOST AMAZING THING
Company: Spinnaker Software
Language: BASIC
Hardware Requirements: 48K

Department: Entertainment
Sugg. Retail: $39.95
Availability: 8
Disk or Tape: Disk

OVERALL RATING	B	CONTROLLABILITY	B−	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	B	DOCUMENTATION	C−
CREATIVITY	A−	CHALLENGE	B+	HOLDS INTEREST?	C+
GAME DEPTH	A	GRAPHICS	C	VALUE FOR MONEY	B−

In Search of the Most Amazing Thing, a game designed for children, departs from the usual kill-the-aliens theme, and encourages you to negotiate with the creatures. In order to succeed in finding "the most amazing thing," you must obtain clues from different alien cultures. You must discover how to interact with them, how to read sign language, exchange currency, read maps, and compose songs for which the aliens might wish to trade information.

The journey begins in Metallica, where old Uncle Smokie weaves tales about his past search and offers you the use of his B-Liner for the trip. The B-Liner is a combination hot-air balloon and dune buggy. It is even equipped with an oil-drilling platform on its rear deck so that fuel shortage is never a problem. However, the B-Liner is not fully equipped. You can auction items gathered from Smokie's previous trips to raise money to buy your equipment. The Metallicans, however, are a crafty bunch. If you ask too much, they will steal your item. It becomes a challenge to outfox the aliens at the auction. Since you need a lot of green chips to buy the necessary things, this portion of the game is extremely slow and repetitive. I've been told that some children are completely absorbed by this section. I was bored, and I'm sure older children would be, too.

Once the B-Liner is fully equipped and you have enough clues from Uncle Smokie, you set out on your quest. You fly or drive around the Darksome Mire and get fuel by anchoring against a Night Rock and drilling for oil. To do the latter, you don a jetpack and fly outside to the rear platform. You drive and fly using the AWDX and S cluster keys. You gather food by driving up to a Popberry Tree, flying to its branches, shaking a piece of fruit loose, and scooping it up from the ground before it sinks into the tar.

Flying the balloon takes practice. Winds of various strengths and directions blow at different altitudes. You can only use one instrument at a time. If you are busy monitoring your radar, looking for the nearest hut, and you want to see if you are getting closer, you have to activate a direction display and an altitude display. Each of these takes time to draw. By the time you figure out you are going in the wrong direction, the hut is gone. At this point, an instrument panel would have been useful. Eventually you drift near a hut somewhere in the Darksome Mire, and then you can drive the rest of the way to the hut.

This portion of the game is designed to make you think. First, you have to read the map to determine which land you are in. (The clues offered by the B-Liner's computer modules require the name of the culture.) The clues will give you information about the aliens, such as what the value of their currency is and what music they like. They will also tell you the aliens' sign language (to which the creatures point with their antennae) for six important phrases used in trading. Since music is very important in trading, you are equipped with a music composer. If you can deal successfully with the aliens without offending them or scaring them away, you can trade for a clue to find "the most amazing thing."

While this game is intriguing and educational, it takes innumerable hours to play. Fortunately, it does have a Save-game feature. The average child may not have the patience to play this game due to the time it takes (even days) to find "the most amazing thing." It certainly teaches the child to think, for the instructions only offer some basic clues. A short novel accompanies the package, giving the child some background. All in all, *In Search of the Most Amazing Thing* is an interesting game for a child with a long attention span.

JUICE

Company: Tronix
Language: Machine
Hardware Requirements: 32K

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	B−	DOCUMENTATION	C
CREATIVITY	C+	CHALLENGE	B	HOLDS INTEREST?	B
GAME DEPTH	B−	GRAPHICS	B	VALUE FOR MONEY	B

Juice is a very slick jumping game in which you control Edison, a kinetic android. As he hops from block to block on a flat circuit board (shown in three-dimensional perspective), the blocks turn into electrical traces on the board. All that Edison has to do is touch every square at least once to complete the circuit on the first level.

To complicate matters, a number of characters called Nohms appear and begin bouncing around the board. If one of the Nohms collides with Edison, he melts. The Nohms don't really chase our friend, but a coilly capacitor creature called Killerwatt does. There is also Flash, who disconnects the traces, and a cute, round, helpful guy called Recharge. If Edison jumps to several little disks just off the edge of the circuit board to escape, he is transferred to the one on the opposite side where he remains safe.

Each time you complete a circuit, the board flashes and you are advanced to a tougher level. At first the boards are more complicated, but later it takes two or more jumps on any square to turn the square into an electrical trace. A timer ticks away, so if you are quick and efficient you can earn a bonus. There is also a bonus if you can lead Killerwatt off the board (stay in front of him and jump to one of the safe disks; Killerwatt will fall off the board as he tries to follow).

Simple as it is, *Juice* is a very good strategy-oriented arcade game. It can become maddening at times. For just this reason the author gives you a choice of eliminating one or more of your opponents. You can even play without any characters on the board if you need to practice. The graphics and sound are first-rate, and of all the jumping-style games, this one is about the best.
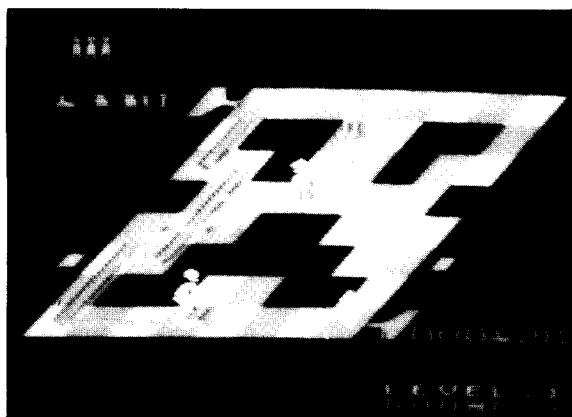
JUICE

KEN USTON'S PROFESSIONAL BLACKJACK

Company: Intelligent Statements
Language: Machine
Hardware Requirements: 48K

Department: Entertainment
Sugg. Retail: $69.95
Availability: 5
Disk or Tape: Disk*

OVERALL RATING	B+	EASE OF USE	B+	ERROR HANDLING	B
GAME CONCEPT	B	SKILL INVOLVED	N/A	DOCUMENTATION	B−
CREATIVITY	N/A	CHALLENGE	B+	HOLDS INTEREST?	B−
GAME DEPTH	C	GRAPHICS	C	VALUE FOR MONEY	B

Ken Uston's Professional Blackjack is intended to teach the blackjack player three different point-counting strategies that are covered in the author's book *Million Dollar Blackjack*. It is based on the theory that even when the casino is using several decks, the character of the deck constantly swings favor from the house to the player and vice versa. For example, if all four aces have been played, no one can get a blackjack. Since the house pays 3 to 2 for a blackjack, this is unfavorable to the player. Likewise, fives favor the dealer, for house rules require him to hit on 16 or less.

Those who just want to have fun should learn the simplest of the three strategies. Those who wish to have a good time without losing any money should learn the "simple plus/minus" card counting system, and those who want to make money at it should learn the "Uston Advanced Point Count" strategy.

The program offers several drill sessions where cards are dealt and the player practices his point-counting strategy. This is one of the best blackjack simulations that I have seen. Six players, either human or computer, can sit at any of the six positions at the table. The table can be any casino in the United States. The disk has all of the special rules stored for each casino and plays blackjack by those rules. For example, if you choose to play in the Reno-Lake Tahoe area, you can choose between Harrah's Circus Circus and other local casinos. During play a high tone alerts you to whether you have made a strategic error. If you press the space bar, you can refresh your memory with the running count, true count, betting true count, and the status of aces. If you just want to play for fun you can turn off the error prompting sounds.

The disk comes with two separate manuals. The first is a sparse but adequate instruction manual to run the program. The other is a detailed explanation of Ken Uston's point-counting strategies. This book contains valuable colored charts that tell you whether to hit or not depending on your point count and what face card the dealer shows.

This package is higher priced than many other blackjack strategy programs, but it is perhaps the most comprehensive learning tool available to anyone seriously interested in learning to play blackjack for money. Ken is living proof that his strategies work, because he is banned in virtually every casino in the United States where point counting is illegal.
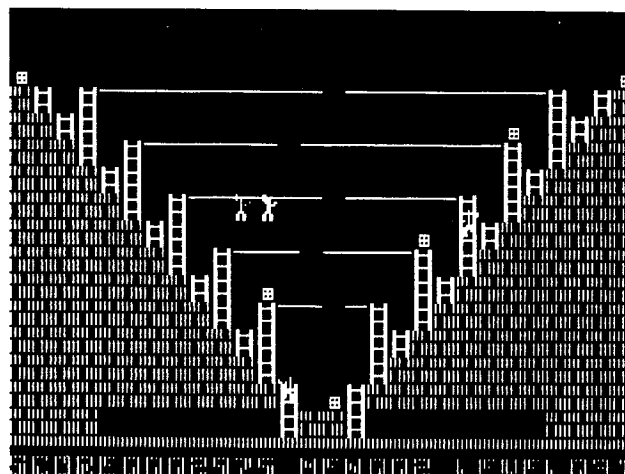
LODERUNNER

KABOOM

Company: Activision
Language: Machine
Hardware Requirements: 16K

Department: Entertainment
Sugg. Retail: $34.95
Availability: 5
Disk or Tape: Cartridge

OVERALL RATING	C−	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	B−	SKILL INVOLVED	C	DOCUMENTATION	C−
CREATIVITY	C	CHALLENGE	B−	HOLDS INTEREST?	C−
GAME DEPTH	C−	GRAPHICS	C	VALUE FOR MONEY	D+

Activision converted their VCS cartridge into *Kaboom*. Naturally, the computer's higher resolution allowed them to improve the graphics, but the result remains a simplistic eye-hand coordination game of reflex. Your object is to catch bombs dropped by the Mad Bomber, an escaped convict. He begins dropping the bombs slowly, in groups of ten, as he moves back and forth across the top of the screen, but he soon increases his speed and doubles the number of bombs. You use a three-tiered paddle or a joystick-controlled water bucket that moves along the bottom of the screen to catch the bombs. If one hits the ground and explodes, you lose a tier. When you lose your bucket, the game ends.

Kaboom becomes interesting only in the two-player game called "Pitch and Catch." The players take turns as the bomber and the catcher, switching when the catcher misses. At least here you can develop a feeling of competition, and with it a reason to play the game. While *Kaboom* found a large audience in the VCS market, computer owners expect games with more depth of play.

LODERUNNER

Company: Broderbund
Language: Machine
Hardware Requirements: 48K

Department: Entertainment
Sugg. Retail: $34.95
Availability: 9
Disk or Tape: Disk*

OVERALL RATING	A	CONTROLLABILITY	A−	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	A	DOCUMENTATION	B+
CREATIVITY	A	CHALLENGE	A	HOLDS INTEREST?	A+
GAME DEPTH	A	GRAPHICS	B	VALUE FOR MONEY	A

Loderunner is a challenging game with 150 different screens or levels. The game is one of those climbing, jumping, ladder and platform style games in which the object is to recover the gold scattered about in the various treasury rooms. Each treasury room is guarded by three or more bungling Empire guards who aren't very bright and can be easily trapped by your unarmed Intergalactic Commando.

The game is joystick or keyboard controlled. The commando can climb ladders, jump down from any height, walk across platforms, and travel hand-over-hand across the bars spanning high spaces. He is equipped with a laser drill pistol to drill passageways through fissured bricks in order to reach hidden gold in sealed chambers or jump between levels. These pits are also the only way to kill or trap a guard.

Each of the *Loderunner* levels presents a fresh challenge, but many require a bit of strategy to master. Some appear unsolvable even after playing them for a long time. They are all solvable but often they build on clues found in earlier levels. Although you can play any level by using the documented cheat keys, there is a certain progression to the game that begins on the first level. These cheat keys also let you play more men, but if you use the cheat keys, you can't save your high score—a fair tradeoff.

With the inclusion of a screen editor to create your own levels, the author elevates a game with good depth to one with unlimited depth. This editor allows you to easily create storage disks with 120 different levels. It is the simplist game generator on the market. The cursor is moved about the screen with the I, J, K, and M keys. Choosing one of the number keys places floors, ladders, handbars, trap doors, gold chests, enemies, and the player anywhere you please. The O key erases mistakes. The Control-S key combo saves the board before you play-test it. Fine tuning each board for playability becomes the hardest part of the game design.

Loderunner is a definite winner. Its graphics offer good animation and it has surprising depth. Strategy is emphasized over outright violence, and the game is to be won only through planning and strategy.

MATCHBOXES

Company: Broderbund Software
Language: Machine
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: $29.95
Availability: 8
Disk or Tape: Disk*

OVERALL RATING	B−	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C+	SKILL INVOLVED	B−	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	B−	HOLDS INTEREST?	C+
GAME DEPTH	C+	GRAPHICS	B	VALUE FOR MONEY	B−

Matchboxes is a nicely animated and tuneful version of the classic T.V. game *Concentration*. This version has features of the *Concentration* game and several others that require the players to guess the scrambled word hidden behind the blocks.

You are presented with a rectangular grid of thirty-six blank numbered boxes. Each of the boxes conceals a nicely animated figure and a fragment of a familiar tune such as "Old MacDonald Had a Farm." A duplicate match appears elsewhere in the grid and your job is to find it. Players use joysticks and fire buttons to uncover two boxes at a time, trying to match the identical pairs. A saying or message is also hidden behind the grid and the player who makes out the entire phrase wins the game.

All of these versions can be played against a computer opponent at one of three levels. Naturally, the computer has a very good memory, but at the beginners level it deliberately misses matches. You get the feeling that the computer is toying with you each time it misses a match. This soon disappears on the upper levels where the computer becomes a more formidable opponent.

The game is ideally suited for family play, especially for those with young children, but in all cases *Matchboxes* is best played against a human partner. The animation is nicely done, and there are good animated sequences of jumping kangaroos, blasting rockets, moving abstract shapes, and a Pac-Man scenario. This, accompanied by familiar tunes, will hold a child's as well as an adult's attention for a long while.

MOON SHUTTLE

Company: Datasoft
Language: Machine
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: $29.95
Availability: 6
Disk or Tape: Disk*

OVERALL RATING	D+	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	D+	CHALLENGE	C+	HOLDS INTEREST?	D+
GAME DEPTH	C−	GRAPHICS	C−	VALUE FOR MONEY	D

Moon Shuttle is a translation of the arcade game of the same name. The object is to navigate your shuttle through an asteroid belt composed of different sized asteroids, blasting a pathway with your missiles. The first asteroid belt is stationary except for the top band of asteroids that move. Subsequent encounters with these belts add more moving asteroids. Since your ship moves forward at a constant rate and has only back and forth mobility, you need to quickly blast a large hole in order to squeeze through.

Once past the asteroids your shuttle encounters various attackers. The first are the Bomb Launchers. They move wildly about the screen until they are about to fire. Bomb Launchers are easy to kill except if hit when flipped over. The second group to appear (after the second asteroid field) are the Expandos. They resemble hypodermic needles. Since they expand when they are about to fire, they are easier to eliminate than the Bomb Launchers. The third set of attackers are the Man-O-Wars. You have to be quick to kill them for they fire without warning. The last are the menacing Blob Men. When they first appear they are large but split into two smaller men when hit. When you manage to rid the screen of these, the game repeats with faster asteroids and more vicious aliens.

Moon Shuttle is a simplistic shoot-'em-up with little real appeal, and the game never was very popular in the arcades. By far the hardest part is to successfully blast a large enough path through the asteroid belt. Fortunately, when you collide with one you don't have to start over, but advance past the belt to an encounter with the next set of aliens. But *Moon Shuttle* is, unfortunately, drab.

MR. COOL

Company: Sierra On-Line
Language: Machine
Hardware Requirements: 16K

Department: Entertainment
Sugg. Retail: $34.95
Availability: 4
Disk or Tape: Cartridge

OVERALL RATING	C	CONTROLLABILITY	C	ERROR HANDLING	**N/A**	
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	**C—**	
CREATIVITY	C	CHALLENGE	C+	HOLDS INTEREST?	**C—**	
GAME DEPTH	C—	GRAPHICS	D	VALUE FOR MONEY	**D+**	

Mr. Cool is basically another *Q-bert* clone with a few added twists that resemble *Pac-Man*. The playing field is a seven-tiered pyramid of hot plates. Our hero is an ice cube who must jump diagonally from plate to plate and turn them all blue. On the first level he only has to land on the plate once, but on subsequent levels it requires two or more landings on each plate. Beneath the plates is a furnace lethal to Mr. Cool if he should miss.

A number of fireballs patrol all of the rows of hot plates; our hero must avoid them at all costs. In addition, four hot springs drop from the top and bounce to the bottom. This makes the game extremely lethal for our ice cube, but he can turn the tables on his adversaries by pressing the joystick once on any one level (this is called "Supercool Time"). For fifteen seconds Mr. Cool can turn the fireballs into snowballs and cool down those hot springs. If he catches fireballs he gains an extra cube, and yet another cube after 20,000 points. There are fifteen rounds to every level, and the levels get faster as you progress.

The graphics in *Mr. Cool* are simple lines on a two-dimensional plane, more of what you would expect in a VCS game. The game exhibits good control when played with "loose" joysticks, but responds poorly with stiff joystick control. It does require some strategy, for like *Pac-Man* you must take the offensive for brief periods of time. In sum, it is a well-made clone.

MR. ROBOT

Company: Datamost
Language: Machine
Hardware Requirements: 48K

Department: Entertainment
Sugg. Retail: $34.95
Availability: 8
Disk or Tape: Disk*

OVERALL RATING	A	CONTROLLABILITY	B+	ERROR HANDLING	**N/A**	
GAME CONCEPT	A	SKILL INVOLVED	B+	DOCUMENTATION	**D**	
CREATIVITY	A—	CHALLENGE	A	HOLDS INTEREST?	**A**	
GAME DEPTH	A	GRAPHICS	A	VALUE FOR MONEY	**A**	

Twenty-two levels make up this jumping, climbing, arcade game. Although it resembles *Miner 2049er*, *Mr. Robot* offers more variety with its many escalators, conveyor belts, ladders, trampolines, teleporters, energizers, bombs to walk over and ignite, and magnets to help you jump further. You try to collect all the power pills on one level before moving on to the next. Your joystick-controlled robot moves from platform to platform using connecting ladders, escalators, and teleporters. He jumps when you press the joystick button. You must not let him fall too far, because if he falls more than one and a half times his own height, he dies. He also has limited energy for each level and must complete his task before he runs out. While doing so, he must avoid or destroy the alien fireballs that wander along the platforms and ladders. Only by touching an energizer and destroying the fireball before the invulnerability fades can you get rid of a fireball.

Each unique level requires planning and strategy to complete successfully. If you wish to design your own screens for the game, you need only use the outstanding *Robot Factory* construction set to create twenty-six different screens using a single joystick. All the possible parts appear at the bottom of the screen. By moving the cursor to the part and pressing the button to grab it, you can move the part to the desired location and press the button to set it there. Holding the button down forms a row of the parts, such as in building a ladder. You erase mistakes by picking up a black piece and moving over the unwanted areas. You are limited to one robot, four alien fireballs, and four transporters. Once you have completed the screen, you can test it. Be sure to hit Select when you finish the test, or you will lose your screen. You save screens to another disk under a letter label. You can later load a particular screen to reedit, or load them all in sequence from A to Z when you want to play the game.

Mr. Robot has excellent graphics. The game is challenging, fun, and diverse. When you add the *Robot Factory* construction kit, the game rises above all the other jumping, climbing games on the market. The creative individual will spend hours creating games for others and enjoy doing it almost more than playing the game.

M.U.L.E.
Company: Electronic Arts
Language: Machine
Hardware Requirements: 48K

Department: Entertainment
Sugg. Retail: $40.00
Availability: 8
Disk or Tape: Disk*

OVERALL RATING	A	CONTROLLABILITY	A	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	B	DOCUMENTATION	B+
CREATIVITY	B+	CHALLENGE	B	HOLDS INTEREST?	A
GAME DEPTH	A−	GRAPHICS	B	VALUE FOR MONEY	A

Basically a strategy game, *M.U.L.E.* combines some of the best competitive features of *Monopoly* with economic simulation games like *Kingdom*. Four people can play, or you can play against three computer opponents. As a colonist from a distant planet, your object is to help the colony become self-sufficient in farming, mining, and energy production. To help you with your work, you can buy a M.U.L.E. (multiple-use labor element) at the local store, equip it, and walk it back to your land. During turns (six in the beginner's game, twelve in the regular game), each player chooses or buys at auction one of forty-four plots of land. You produce what you wish for that turn, based on how much food and energy you have. Random events sometimes influence the results. At the end of the month, you can buy or sell goods at an auction, based on whether you face a shortage or surplus. The auction follows the laws of supply and demand and becomes the best part of the game because of its cutthroat nature. For example, miners of Smithore earn a great deal but also pay dearly for their consumption of energy and food. Buyers and sellers control prices by moving their bid and ask lines. When a match results, a transaction takes place. I enjoyed watching players scramble for limited supplies, but you can't get too greedy because the survival of the entire colony is at stake. At the end of the auction, players receive status reports telling who leads.

The game teaches valuable lessons in economics in a fun way. You not only learn the theory of supply and demand, but also that increased size leads to increased production, and increased knowledge leads to increased efficiency. You also observe the law of diminishing returns as you try to establish a monopoly. If you look out only for yourself, the poorer players can't afford to buy the energy and food that you produce.

Random events also influence the game. Planetquakes halve mining production, space pirates steal Smithore, your M.U.L.E. might run away, the general store may burn down, acid rain can lower food production, and hoarded food spoils. You may even go Wumpus hunting after outfitting your M.U.L.E. If you can catch a Wumpus when he opens his cave door and shines his light, you can hold him for ransom.

The game offers three levels of play. The beginner's level avoids some advanced features and is short lived. The regular game introduces land auctions, minimum production requirements, and land development. The tournament level adds the chance to prospect rare Crystite and lets you form cartels. All three are extremely well designed and rival the best of the board games. You can easily play using only a joystick. The graphics are colorful and nicely animated, and even the music is good, with original, toe-tapping tunes. When several people play, the game becomes involved and interactive.
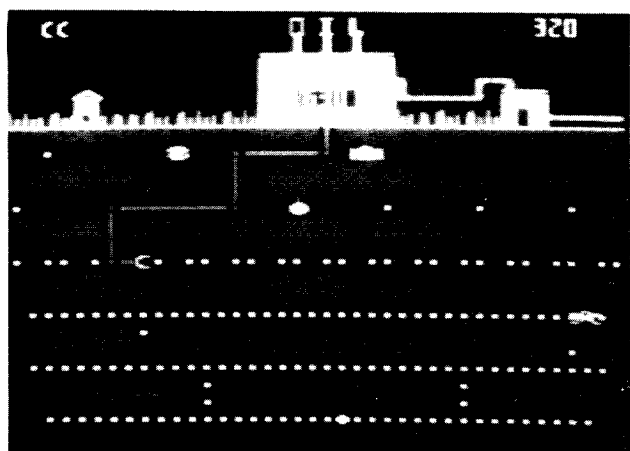
NIGHTSTRIKE
Company: T.G. Products
Language: Machine
Hardware Requirements: 16K

Department: Entertainment
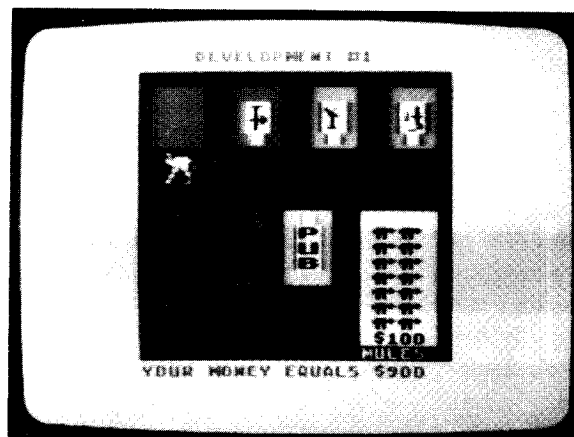**Sugg. Retail:** $44.95
Availability: 3
Disk or Tape: Cartridge

OVERALL RATING	D	CONTROLLABILITY	C−	ERROR HANDLING	N/A
GAME CONCEPT	C−	SKILL INVOLVED	D	DOCUMENTATION	C−
CREATIVITY	D	CHALLENGE	C	HOLDS INTEREST?	D
GAME DEPTH	D	GRAPHICS	D+	VALUE FOR MONEY	D−

The Solitare Group is back with another mindless shoot-'em-up. The object of *Nightstrike* is to defend a city from a fleet of enemy bombers. A joystick-controlled tank moves along the bottom of the screen. Its tank turret is also steerable and can be aimed along a number of different angles or elevations. Ammunition is 20 mm anti-aircraft shells, but both flak shells and flares can also be loaded by pushing the joystick either up or down before firing. The flak shells are detonated by pressing the button a second time and will destroy any targets within a given radius. Flares are necessary only at the upper levels when the bombers fade into the twilight. The bombers are more aggressive. Two of them fly kamikaze missions and one flies a dangerously low bombing mission. Either type is difficult to hit and is likely to hit you if you don't remain mobile.
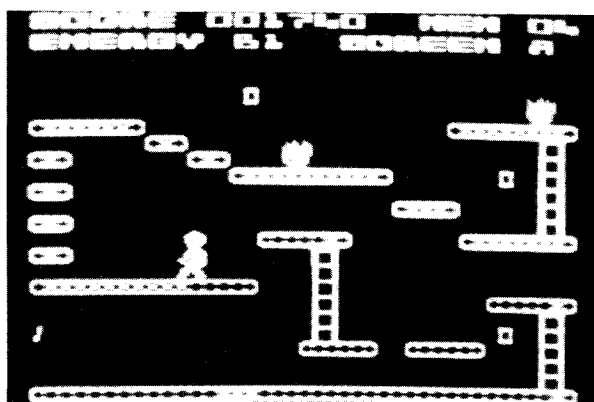
Unfortunately, this game boils down to mindless destruction of anything that flies, but don't fire too aimlessly since the bonus award at the end of each level is based on the ratio of shots per kill. The entire game takes place on one screen and becomes old very quickly.

OIL'S WELL

M.U.L.E.

MR. ROBOT

OIL'S WELL
Company: Sierra On-Line
Language: Machine
Hardware Requirements: 16K

Department: Entertainment
Sugg. Retail: $29.95
Availability: 7
Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	**N/A**
GAME CONCEPT	B–	SKILL INVOLVED	B–	DOCUMENTATION	C
CREATIVITY	B–	CHALLENGE	B	HOLDS INTEREST?	B
GAME DEPTH	C–	GRAPHICS	C	VALUE FOR MONEY	C

Oil's Well provides an interesting and addicting variation of an eat-the-dots maze game. Using a joystick, you control a drilling rig on top of a maze of passageways containing droplets of oil. The oil pipe, equipped with a drill bit resembling teeth, extends from the platform like a long snake as you guide it deeper and deeper into the maze. Pressing the joystick button retracts the drill partially or completely. You need this retractibility to counter pipe-eating Oozies that wander the corridors. You can eat an Oozie by attacking it head on, but if one approaches your pipe from the side, you must retract it before the Oozie touches it. The game thus becomes one of cat-and-mouse, with you trying to reach the deepest oil reserves without letting an Oozie attack your pipe. One vitamin pill, buried deep in the maze, will temporarily slow down the Oozies if you can reach it. You also need to watch out for occasional bombs. Once you successfully mine all the oil, you advance to a faster level.

Despite the simplicity, lack of depth, and mediocre graphics, I found the game fascinating to play. You compete against the Oozies in drilling for oil and must be quick to survive. It seems all your fault if you lose, and if you only play again, you can win. It becomes addictive.

ORC ATTACK

Company: Thorn EMI
Language: Machine
Hardware Requirements: 16K
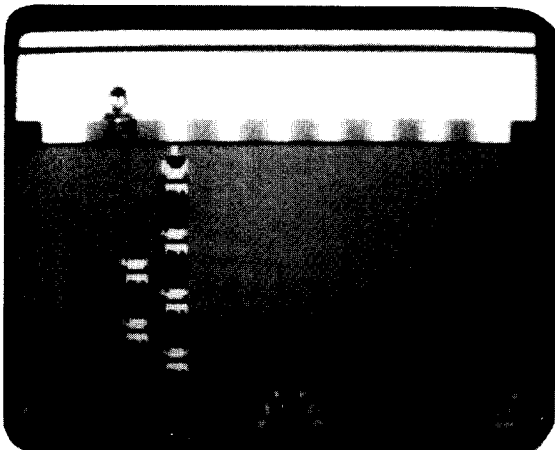
Department: Entertainment
Sugg. Retail: $39.95
Availability: 4
Disk or Tape: Cartridge

OVERALL RATING	C	CONTROLLABILITY	C	ERROR HANDLING	**N/A**
GAME CONCEPT	**B**	SKILL INVOLVED	C	DOCUMENTATION	**C**
CREATIVITY	**B**	CHALLENGE	C	HOLDS INTEREST?	**C−**
GAME DEPTH	**C+**	GRAPHICS	**C+**	VALUE FOR MONEY	**C−**

In the arcade game *Orc Attack*, you must defend your castle from the attacking Orcs and their evil allies, the Sorcerer and the dreaded Stone Warts. You guard the castle from the parapet using rocks, swords, and boiling oil. At the beginning, the Orcs move in with short ladders while their bowmen shoot arrows at you. Most of the arrows bounce harmlessly off the battlements. Hurling rocks through the gaps in the stone allows you to fend them off until your boiling oil is ready to drop. The flames quickly spread to their ladders, and the climbing Orcs drop flaming to their deaths. The bodies collect in a grisly pyramid. If you complete the body count pyramid, you gain an extra life for yourself.

Next, the Sorcerer enters, conjuring floating skulls. You must destroy these with rocks before they reach the top of the wall or you lose some of your lives and parts of the walls. It seems unlikely that you can kill the Sorcerer, but you gain a substantial number of points if you hit him. You will also find it difficult to deal with the Stone Warts, which appear between Orc rounds and hurl lightning bolts at you. Should you manage to survive, you face successively more difficult rounds of attack. The Orcs employ higher ladders to bring them nearer the top. Once they reach your level, you grab a sword and try to kill or injure each one before it can stab you with its vile dagger. You can deliver a strong blow by pulling the joystick towards you as you press the button, but only a few super blows are available to you. You must use them carefully, perhaps against a Ninja Orc who climbs walls without a ladder.

This game is certainly original. Although it lacks constant action and excitement, the graphics are good and animated. The Orcs could be more evil looking. The game does give you the option of beginning at higher levels of difficulty and lets one to four people play if they alternate. Although hard to identify with, the game is interesting and mildly entertaining.

ORC ATTACK
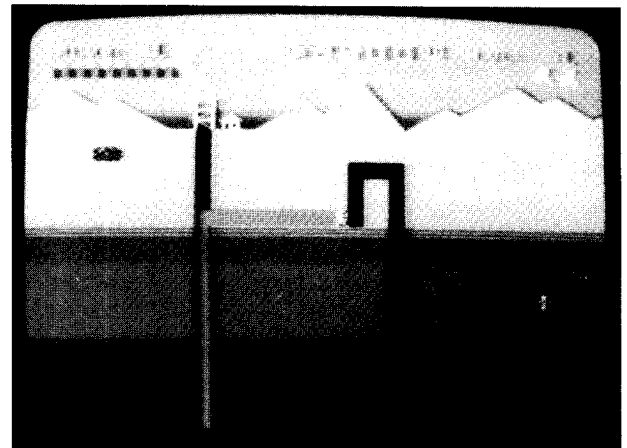
O'RILEY'S MINE

O'RILEY'S MINE

Company: Datasoft
Language: Machine
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: $29.95
Availability: 7
Disk or Tape: Disk

OVERALL RATING	D+	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C−	DOCUMENTATION	C
CREATIVITY	D+	CHALLENGE	C	HOLDS INTEREST?	D
GAME DEPTH	D	GRAPHICS	D+	VALUE FOR MONEY	F

O'Riley's Mine is a simple, slow-paced treasure hunting game. You steer your miner around the screen as he digs tunnels to reach the various mineral deposits buried in the earth. The problem is that the tunnels gradually fill up with water. In addition, there are monsters dogging your every move, and while you can't shoot them, you can set a dynamite charge to block their way.

Collecting all of the diamond, ruby, coal, uranium, and oil deposits requires planning and strategy. As the water reaches the highest levels of your tunnels, you need to reach all of the low-lying treasure on both sides of the main shaft. You have to work quickly, for your dynamite charged cave-ins won't block the water from rising. If you mistakenly dig too high, the water in the main shaft will rise to block your escape. The game has progressively harder levels, with more monsters and treasures, and you can't exit the mine until you recover all of the treasure.

The simple graphics are colorful, and the field scrolls slightly to accomodate the mine. Although the game is fairly simplistic with little depth, its random placement of treasures will keep you thinking. Despite its simplicity, it might be worth looking at, but not at $29.95.

PROBE ONE: THE TRANSMITTER

Company: Synergistic Software
Language: Atari BASIC
Hardware Requirements: 40K

Department: Entertainment
Sugg. Retail: $34.95
Availability: 9
Disk or Tape: Disk

OVERALL RATING	D+	DIFFICULTY	D+	ORIGINALITY	C−
PUZZLE QUALITY	D	EASE OF USE	B	DOCUMENTATION	D
TEXT QUALITY	D+	VOCABULARY	C−	HOLDS INTEREST?	D
GRAPHICS QUALITY	C+	SAVE/RESTORE	C	VALUE FOR MONEY	C−

Probe One: The Transmitter is a real-time graphics adventure program. Your object is to explore a lifeless Terran outpost and locate and retrieve a prototype matter transmission device. Before the last outpost crewmembers died, they reprogrammed the maintenance robots for defense. These robots make up for their lack of weaponry by sheer numbers. Interaction with the program involves a combination of the computer keyboard and either a joystick or paddle. The joystick or paddle is used to aim and fire your stun gun at the sentinel robots, thus destroying them.

Other than the pesky robots, the only threats to your well-being are non-operational gravity shafts. These shafts can only be seen if you are wearing a pair of goggles found at the outpost. Once you locate the shaft with your goggles, it reappears every time you are in that room, even without the goggles.

Designing an adventure game is not easy. The puzzles need to be sufficiently complex to be interesting, without being so obscure that the average player has no chance. *Probe One* has no such depth. Once you have determined all the facts the instructions should have mentioned but didn't, the only remaining question is whether persistence will win out over boredom.

Q✸BERT

Company: Parker Brothers
Language: Machine
Hardware Requirements: 16K

Department: Entertainment
Sugg. Retail: $29.95
Availability: 7
Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C+	DOCUMENTATION	C
CREATIVITY	B	CHALLENGE	B	HOLDS INTEREST?	C
GAME DEPTH	C+	GRAPHICS	B−	VALUE FOR MONEY	B−

Q✸Bert, a round little character who looks like a cross between an anteater and a kiwi, roams a pyramid of twenty-eight squares. You try to land him on every square at least once. This changes the square's color, the purpose being to change the color of the entire pyramid. If Q✸Bert hops over the side of the pyramid, he plummets to his death unless he can jump to one of the two disks near the edge. They transport him back to the top of the pyramid, where he once more faces his enemies. These consist of Coily, who hops on a spring and tracks Q✸Bert's movements; a red ball that rolls from top to bottom; a purple ball that hatches Coily when it reaches bottom; a green ball on the upper levels that freezes all the characters for a moment if you catch it; and Sam, who changes the color of the squares back to the original, forcing Q✸Bert to retrace his path. You can earn a substantial bonus by luring Coily off the board as you jump Q✸Bert to a disk.

Each level of the game becomes progressively harder. Not only does Q✸Bert face more enemies, but on level two he has to step on each square twice because the first step yields an intermediate color. Upper levels add the complication of squares that change to an intermediate color if you jump on them too many times.

The hardest thing to get used to is the control system. You need to turn the joystick forty-five degrees to achieve diagonal movement, but you discover this only by studying the manual. Except for this, the cartridge represents the original coin-operated game well. Although simple in theme, *Q✸Bert* utilizes a good idea, stresses nonviolent strategy, and holds your interest.

RIVER RAID

Company: Activision
Language: Machine
Hardware Requirements: 16K

Department: Entertainment
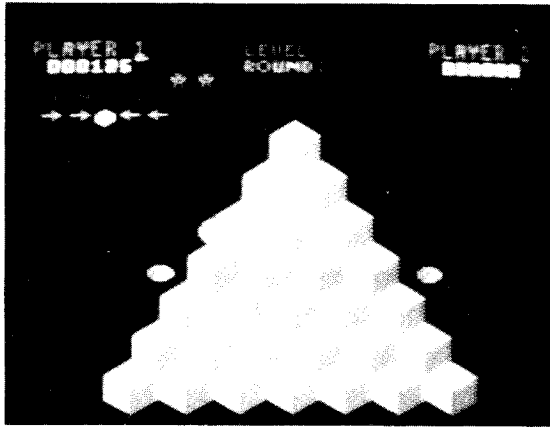**Sugg. Retail:** $34.95
Availability: 6
Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C+	CHALLENGE	B	HOLDS INTEREST?	B
GAME DEPTH	B−	GRAPHICS	B	VALUE FOR MONEY	B

Activision did a credible job in translating *River Raid* to computers. In many ways they improved the game, especially the graphics. In the game you fly a joystick-controlled jet fighter down a narrow river, destroying as many targets blocking your path as possible and avoiding the rest. The river is cluttered with ships, jet fighters, helicopters, bridges, and fuel depots. You can destroy the depots for points or use them to refuel your plane as you fly deeper into enemy territory. Each bridge marks a level of difficulty. On the harder levels the river narrows and the firepower opposing you increases. You must stay over the river because, strangely enough, your plane can only fly over water. Moving the joystick from side to side causes the plane to bank in either direction, while pushing it forward or pulling it back changes the plane's speed.
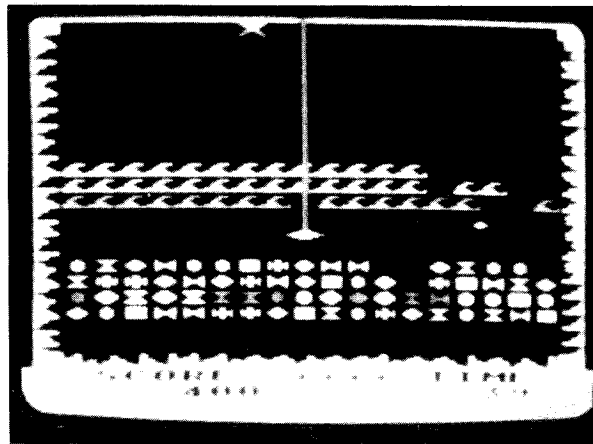
Two people can alternate playing the game, beginning on the level of their choice. The game is fun to play and even moderately addictive.

Q*BERT
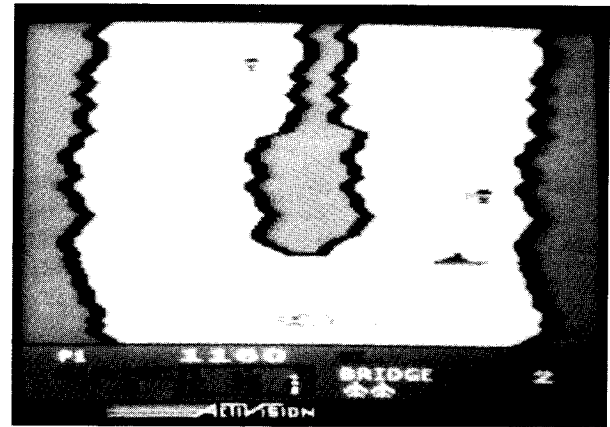
RIVER RAID

SEA BANDIT

SEA BANDIT
Company: Gentry Software
Language: Machine
Hardware Requirements: 16K

Department: Entertainment
Sugg. Retail: $16.95
Availability: 4
Disk or Tape: Both

OVERALL RATING	**C–**	CONTROLLABILITY	**C**	ERROR HANDLING	**N/A**
GAME CONCEPT	**C**	SKILL INVOLVED	**C–**	DOCUMENTATION	**C–**
CREATIVITY	**C–**	CHALLENGE	**C**	HOLDS INTEREST?	**D+**
GAME DEPTH	**D+**	GRAPHICS	**C**	VALUE FOR MONEY	**C–**

In *Sea Bandit* you must collect four rows of colorful treasures at the bottom of the ocean by first breaking through three rows of ocean waves with your bouncing energizer. Your joystick controls a treasure probe that guides the bouncing energizer down to the bottom of the ocean.

Two things complicate the game. First, it is a timed game so that you need to work very quickly to clear an entire level before the clock runs out. Second, mines continually rising from the bottom of the ocean are set to destroy your probe. A mine catcher at the top that moves back and forth across the screen can be operated by holding the joystick button, but this freezes the probe. Catching a mine adds three seconds to the clock. This mine catcher can also blow up an energizer, of which you have only five.

Sea Bandit requires intense concentration. Some will dismiss it as just another variation of *Breakout*, but those who play it may find that it offers a slow-paced yet substantial challenge.

SHAMUS: CASE II

Company: Synapse Software
Language: Machine
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: $34.95
Availability: 9
Disk or Tape: Disk

OVERALL RATING	A−	CONTROLLABILITY	A	ERROR HANDLING	N/A
GAME CONCEPT	A−	SKILL INVOLVED	B+	DOCUMENTATION	B−
CREATIVITY	B	CHALLENGE	A	HOLDS INTEREST?	B
GAME DEPTH	B+	GRAPHICS	B+	VALUE FOR MONEY	A−

Shamus: Case II is a fast action game which combines characteristics of the arcade shoot-'em-up and graphic adventure. As the Shamus, a futuristic version of a fifties private eye, you battle your way through a maze of underground passages until you reach the lair of your arch-enemy, the Shadow.

Have no fear: the author of the original *Shamus* is not attempting to capitalize on its success with a pale imitation. Aside from the names of the two lead characters, there are few similarities between the two games. The graphics are new, as are the perils you face. These include poisonous snakes, walls of vicious mutant creatures, and ladders with rungs which disappear at just the wrong moment.

Although strategy is important in *Shamus II*, you will be far better served if you have great reserves of speed and accuracy. You must avoid the horizontally moving snakes, which is complicated by your inability to stand still on a ladder. In some chambers, you must destroy dozens of mutants before they descend upon you. If they reach the chamber's floor, a segment of the floor will disappear. Lose the last piece of floor, and you will drop through to the chamber below.

Fans of *Shamus* will welcome the inclusion in *Shamus II* of a pause feature. If you press the space bar, a map of the explored cavern parts will appear. This map includes your present location and your goal (with a great deal of empty space between the two). Press the space bar again and return to the battle.

Shamus II is far from a run-of-the-mill rehash of a successful game. It is even more original, exciting, and difficult that its predecessor, almost taking the dread out of the word "sequel."

SLINKY

Company: Cosmi
Language: Machine
Hardware Requirements: 16K

Department: Entertainment
Sugg. Retail: $9.95
Availability: 4
Disk or Tape: Tape

OVERALL RATING	C	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C+	SKILL INVOLVED	C+	DOCUMENTATION	B+
CREATIVITY	C−	CHALLENGE	B	HOLDS INTEREST?	D+
GAME DEPTH	C+	GRAPHICS	C	VALUE FOR MONEY	C+

A variation of the familiar *Q*Bert* arcade game, *Slinky* consists of fifty-four blocks that change color as your slinky hops from block to block. A few adversaries complicate things, but your primary strategy involves the scoring system. You begin with 25,000 points. You lose 100 points every time Slinky moves while he is clean or yellow. Your best chance of survival is catching bonus point objects to avoid losing the game.

Several enemies impede completion of your task, while several allies help you. Marge the Magnet drags you off the screen to your doom; sometimes you get lucky and she drops you elsewhere on the stack. Ralph the Raindrop gets Slinky wet (blue), which lets him travel twice as fast and keeps him free of penalties for landing on the blocks. However, while wet he is vulnerable to Dusty, the moving dust cloud. If Dusty catches your hero, he begins to rust (turns brown). In this state, each move costs you 500 points until you can no longer move. Lorenzo, the dreaded chameleon, moves so quickly that Slinky had better get wet before he reaches the sixth level so that he can outrun him. In addition to these dangerous characters, a number of black holes scattered throughout the stack magically transport you back to starting position. Worse, by the third level the blocks change color every time Slinky lands on them, making it harder to flip all fifty-four to the right color. By the time you hit the sixth level, you face disappearing cubes, black-out conditions, and flashing colors to confuse you.

A tough game, *Slinky* is likelier to be lost by lack of strategy than by encounters with enemies. *Slinky* calls for strategy different from that employed in a game like *Q*Bert*. This adds interest. The graphics are good, with Slinky moving like the slinky toy as he hops from block to block. Joystick control responds well to the diagonal moves necessary.

SQUISH 'EM

OVERALL RATING	D+	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	D	SKILL INVOLVED	D+	DOCUMENTATION	C
CREATIVITY	D	CHALLENGE	C−	HOLDS INTEREST?	D+
GAME DEPTH	D	GRAPHICS	D+	VALUE FOR MONEY	D

Squish 'em, a lightweight arcade game, resembles *Crazy Climber.* Your character must climb the girders of a forty-eight story building to retrieve a suitcase. Various monsters and an unseen enemy drop boxes, making the climb perilous. You employ the firing button to lift your character's legs so that he can slide over them, or make him pause and drop his legs to squish 'em for points. Once your character touches the suitcase he faces the same task on a similar building.

Squish 'em lacks depth and cannot hold your attention for more than a short time, but I found it fun to play. Unfortunately, it looks very much like a VCS game that never got released, but instead was converted to the Atari computer system. It is so spartan, the graphics plain and sparse in detail, that even as you accumulate points you have no idea what floor you are on.

STAR LEAGUE BASEBALL

OVERALL RATING	A	CONTROLLABILITY	A−	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	B+	DOCUMENTATION	B+
CREATIVITY	B	CHALLENGE	A	HOLDS INTEREST?	A
GAME DEPTH	B+	GRAPHICS	A−	VALUE FOR MONEY	A

Star League Baseball ranks as the best computer baseball simulation that I have ever seen. The game achieves this through good perspective graphics, simple control, realistic animation and sound, and out and out playability. You can play the game either against the computer or another person. Unlike Coleco's newest cartridge, you play this game on a single screen with the perspective of a person sitting high in the right field stands. This compromise position allows good 3-D perspective of hit balls, which throw a shadow, but sacrifices some of the excitement of the pitching and batting. In particular, the short throwing distance makes it difficult to accurately judge the position of the ball. You need a good eye, a quick trigger finger, and precise timing to hit the ball.

The designers chose a simple control system for the game, well thought out and natural. For example, whenever a ball is thrown to a base, you see the base positions and the infield as if you stood on the pitcher's mound. You push right for second base, up for third, and so on. To avoid confusion in choosing the player who gets the ball, the one closest to the ball takes it (he turns black).

The real heart of the game is the pitching. You can choose three different pitchers at the start of the game, but you cannot change pitchers until the seventh or eighth inning even if they begin to tire. One pitcher throws mostly sliders and screwballs, another curves and sinkers, and the last a good fastball and knuckleballs. You select one of eight possible pitches by holding the button down and getting the pitcher into position. Moving the joystick in one direction specifies the pitch and throws the ball. Frankly, I found it a little hard to tell the pitches apart except in the broad categories of high and low, fast and slow. Some of the balls sink and wobble, but in a very short space and not for very long. If you release the button before the pitcher throws the ball, he comes out of pitching mode and can pick off a base runner.

The poor batter has less control. He can hit any pitch across the strike zone and be rewarded with a cracking sound, but he lacks control of his swing except for the timing. The pitch and the timing of his swing determine the ball's trajectory. If he manages to hit a high pitch, the ball will generally become a high fly ball. Low balls usually become grounders. Slightly early or late timing usually hits a foul ball into the stands if the batter manages to connect. Bunting depends upon pressing and holding the button as the pitch comes in. Once the batter has hit the ball, joystick control moves the lead runner, the others following perforce.

The authors not only created an enjoyable game for two players (or one against a tough computer oponent), they

also included finishing touches that add realism to the game. The crowd cheers and music plays when tension builds, as when the bases are loaded. The scoreboard sometimes displays trivia questions, scores for other games in the league, and the paid attendance of the game. You can even practice batting, important particularly when you play against the computer. The computer-controlled team fields and tags base runners with smooth skill.

Star League Baseball takes practice to master, especially when learning to throw to third base to stop the advancing runner, or to any base to stop a runner trying to steal. I have played many baseball games on various computers and game systems, but this is the best. While Coleco's two-screen version has better batting and pitching, their game suffers from a grossly over-complicated control system requiring a joystick, four finger buttons, and a keypad. *Star League Baseball* combines the best features from many different games, employs a field perspective suitable for all phases of play, and depends upon a simple control system. The result is a game that a novice can master and enjoy. It may lack the bells and whistles of some of the other games, but it certainly ranks as the most playable and enjoyable baseball game on the market today.

SUSPENDED

Company: Infocom, Inc.
Language: Assembly
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: $49.95
Availability: 9
Disk or Tape: Disk

OVERALL RATING	A	DIFFICULTY	B	ORIGINALITY	A
PUZZLE QUALITY	A	EASE OF USE	A	DOCUMENTATION	A
TEXT QUALITY	A	VOCABULARY	A−	HOLDS INTEREST?	A−
GRAPHICS QUALITY	N/A	SAVE/RESTORE	A	VALUE FOR MONEY	A−

Suspended is a science fiction all-text adventure game in which you are the central mentality of a planet. Normally, three underground filtering computers keep conditions stable and under control. In an emergency, you may manually control the filtering computer functions to minimize surface casualties, while you repair the damage that woke you from your 500-year sleep. Should the populace suffer drastically while you attempt these repairs, "talking mechanisms" will quickly replace you.

Each robot perceives his surroundings differently; thus, each robot's report regarding the contents of a given room may be wildly different. Only Iris can see, only Auda can hear, and Sensa perceives the state and patterns of electromagnetic energy. Waldo has a great gift of touch and is handy at fixing things. Whiz can get clues for you from his four-computer peripherals. While not infallible, Poet can touch an object and tell if it is working or not; his "way-out" reports give him a fresh personality that steals the whole show.

The few puzzles, complex and highly interactive, must be solved in a minimum number of moves. The initial puzzle is pretty obvious: Iris can't see. Subsequent puzzles are not so obvious, except that an errata sheet needed to cover a bug advises you that some filtering computer cables must be replaced. Sadly, only one puzzle requires the use of two robots working together; this is regrettable, considering the potential of the concept. After rebalancing the repaired computers, you receive a two-screen conclusion summarizing the casualties and move requirements. You also get a relative efficiency score of one to seven and an appropriate reward, ranging from being burned in effigy to being considered for a home in the country and an unlimited bank account.

The best strategy is to march each robot around and discover his limitations and visualizations; after this, the game will start to make sense. Use the computer peripherals to get information on the objects that are encountered. Then, when you attempt to "solve" the game, watch for opportunities to conserve moves; for example, if you need two robots to arrive at two locations at the same time, order the one farthest from his destination first. As new robots come into play, those commanded earlier will continue toward their specified goal, advising you when they arrive.

After you get a grade of three (savior of the planet) or four (a candidate for a frontal lobotomy), other levels of difficulty await. In Advanced, events move faster and only five of the robots are available to you. In Configure, you define the starting setup. You can "cheat" a smidge by starting with Iris fully functional and your robots better positioned. In the Impossible mode, it's two moves and zap! To add variety to replays, the computer reset codes change from game to game, or during the game if you try to cheat. A real challenge for the replays would have been to change the color or lengths of the four replacement cables which can be found among the eight used in the system.

Mapping the 61-room complex is not necessary; a nifty map board is supplied. Just take good notes on what each

robot sees in each room. The game shares the superlative parser and save-game feature of the other Infocom adventures; the latter should be used frequently to promote efficiency. Note that a robot must have the "attention" of the area which you wish to investigate more closely. In light of this fact, the fine vocabulary is occasionally marred. *Suspended* has a superb plot, features, and concept; however, the game has not exploited its concept to the extent that it could have.
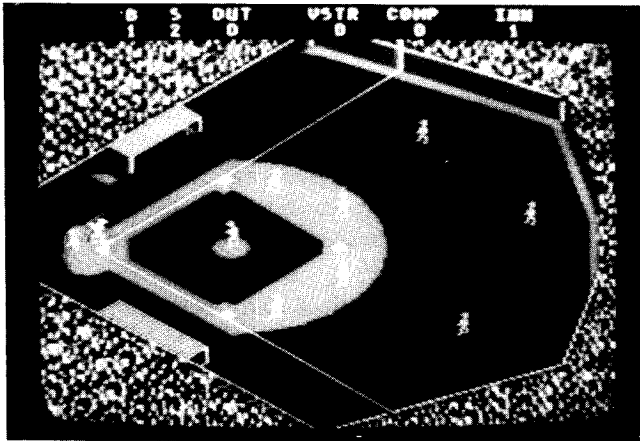
STAR LEAGUE BASEBALL
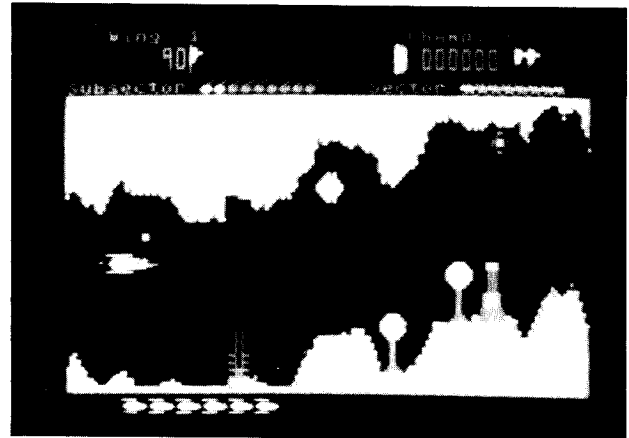
TAIL OF BETA LYRAE

TAIL OF BETA LYRAE

Company: Datamost
Language: Machine
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: $34.95
Availability: 6
Disk or Tape: Disk*

OVERALL RATING	B+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B+	SKILL INVOLVED	B	DOCUMENTATION	C
CREATIVITY	B	CHALLENGE	A	HOLDS INTEREST?	B+
GAME DEPTH	B+	GRAPHICS	A–	VALUE FOR MONEY	B+

Tail of Beta Lyrae, a horizontal scrolling shoot-'em-up game, follows the tradition of arcade games like *Scramble*. A nomadic race of aliens has taken over the mining settlements on the tail of the double star Beta Lyrae. Your mission: to destroy the alien surface installations and force their retreat from the inner planetoids.

Despite the familiarity of this classic scenario, the game possesses remarkable depth. It covers eight levels of nine sectors each, with terrain ranging from mountains to caverns, cities, and outer space. Your ship is joystick controlled and equipped with a particle beam weapon system. You can move up and down, backwards and forwards by accelerating and decelerating the rocket engines. You can destroy most of the ground installations with the particle beam, but such things as communications antennas need time to fall. Alien barricades resembling rotating floating barbells are indestructible. You must destroy ground lasers and plasma cannons, or sneak through gaps in the firing sequence. All of the hazards and alien installations are cleverly animated. The terrain is initially mountainous, but becomes cavernous on the second level and a cityscape on the third. The last level takes place in outer space, an area swarming with meteors. Although you cannot see all the levels without progressing through them one by one, a secret code word allows you to advance to the sixth level. You may not want to do this, however, because the game definitely gets harder near the end. You can increase the difficulty yourself by pressing a number from one to six at the start page.

The graphics are good and nicely animated. What I really found impressive was the eerie music, composed by Gay Gilbertson and played throughout the game. You can listen to the entire theme minus sound effects if you watch the mission briefing during the booting up period. The music deserves an award for originality, and the game equals the best of the scrolling shoot-'em-up games on the market. It has greath depth, is extremely playable, and offers a challenge even on the easiest level.

TIME RUNNER

Company: Funsoft/IJG, Inc.
Language: Machine
Hardware Requirements: 32K

Department: Entertainment
Sugg. Retail: $29.95
Availability: 4
Disk or Tape: Disk

OVERALL RATING	**C-**	CONTROLLABILITY	**B-**	ERROR HANDLING	**N/A**
GAME CONCEPT	**C**	SKILL INVOLVED	**C**	DOCUMENTATION	**D**
CREATIVITY	**C-**	CHALLENGE	**C**	HOLDS INTEREST?	**D+**
GAME DEPTH	**C-**	GRAPHICS	**C-**	VALUE FOR MONEY	**D+**

In *Time Runner*, an arcade game based on the coin-operated *Amidar*, you fill in the dotted lines enclosing twenty rectangles on a grid while four defender droids chase you. When you have completed your task, you advance to the next level. Your score increases by the point value on the bonus timer. Even numbered levels have countdown point values for each block, but the value inside the rectangle falls rapidly once you have surrounded several sides. Unless you quickly finish the perimeter, you lose hundreds of points. You get three jumps that momentarily paralyze the droids, and you can even pass through them while they stand stunned.

The game suffers from its simplicity and lack of depth. The concept is overworked and becomes repetitive. Although not a bad game, it cannot match others with better graphics and more depth.

ULTIMA II

Company: Sierra On-Line
Language: Assembly
Hardware Requirements: 48K

Department: Entertainment
Sugg. Retail: $59.95
Availability: 9
Disk or Tape: Disk

OVERALL RATING	**A**	CONTROLLABILITY	**B**	ERROR HANDLING	**N/A**
GAME CONCEPT	**B**	SKILL INVOLVED	**B**	DOCUMENTATION	**B**
CREATIVITY	**B**	CHALLENGE	**B**	HOLDS INTEREST?	**A**
GAME DEPTH	**A**	GRAPHICS	**A**	VALUE FOR MONEY	**A**

Ultima II is the long awaited follow-up to the original *Ultima*, a fantasy role playing game by Lord British. It seems that when Mondrain was finally killed in the earlier game, we didn't find and deal with his apprentice, Minax. Now that she has come of age, she is even more powerful than her predecessor.

More than a simple successor with new maps and challenges, *Ultima II's* three disk sides take you to several towers and villages, five time periods, and ten planets, in addition to the towns, castles, and dungeons that players of the original game will remember. This time, towns and castles, as well as villages, are in the colorful, multi-screen scrolling form that so distinguished *Ultima*. Each of their layouts and contents are different, except that one of the castles appears in two time zones. There are time portals, horses, ships, airplanes, and rockets to ride around in. Fewer dungeons and towns provide a more balanced game.

The commands are generally the same, but have been streamlined by dropping those which were seldom used and adding two more useful ones: an interrupt, (Y)ell, to permit a pause for thoughtful planning, and a (V)iew command which provides an excellent single screen graphic of the location in which you are currently scrolling your merry way. Without it, *Ultima II* would be a mapmaker's ultimate challenge; as it is, mappers will have plenty of action in the dungeons which seem to go on forever. The command execution time is also pleasantly speeded up over the original. The game even comes complete with a neat cloth map representing most of the time portals on a "from-to" basis; it's pretty, but not much use in the game.

To achieve the goal and rid the universe of Minax, your fantasy character (your choice of four races, three types, two sexes, and six allocatable attributes) faces many hours of searching, interrogations, and monster whomping. The monsters serve as a source of gold, and there are many ways to spend your hard earned loot; many are mandatory if you are ever to succeed in winning. You only need to obtain two objects to defeat Minax, but both take time, thought, and money—so it's back to whomping monsters.

There are a few bugs, but none fatal. As a hint, load up on Strength at the outset, as it's the one attribute that can't be increased. Also, don't exit the town if any attribute goes over 99, unless you're rolling in gold. My only gripe is that it has the same Save-game routine as in the original *Ultima*. While you can save it at any point, it can be recalled only on Drive A through lengthy rebooting. Yet such defects pale in the face of this graphical *tour de force;* whether you played the first version or not, this one is a must.

TRIAD

Company: Adventure International
Language: Machine
Hardware Requirements: 48K

Department: Entertainment
Sugg. Retail: $34.95
Availability: 5
Disk or Tape: Disk*

OVERALL RATING	C−	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C+	DOCUMENTATION	C
CREATIVITY	C−	CHALLENGE	C	HOLDS INTEREST?	D+
GAME DEPTH	C	GRAPHICS	C−	VALUE FOR MONEY	D+

Triad combines the usual shoot-'em-up arcade-style game with *Tic-Tac-Toe*. Each of the nine game squares has the picture of one of nine different alien creatures that you have to battle. These nine types are randomly put into each of the squares to offer game variety. If you manage to defeat the bugaboo pictured in that square you receive an O. If you lose, the computer draws an X. Three X's or three O's in a row wins, just like in *Tic-Tac-Toe*.

Each of the nine bugaboos has a different attack pattern. If you don't learn the attack pattern which is described in the instruction book, you may never defeat them. For example, arrows which are moving to the right are invulnerable to your missiles. But if you can hit the arrow just as it enters the screen, it will turn and travel to the left. (This is one strategy you will probably never deduce by trial and error.) Some creatures have to be hit head-on to kill them, others from the side. Killer bees can only be destroyed by horizontally-moving arrows. The chessmen are the most interesting. If hit, the pawn will split into a knight. If hit again, it will become a rook, and finally becomes a queen which can be killed. The pieces that were traveling horizontally or vertically will begin traveling diagonally and vice versa.

The game can be played by one or two players using a joystick. In the two-player mode the player who succeeds in defeating the bugaboo will capture the square. He can't win by default as in the one-player game. The graphics are mediocre, but the game play is intriguing and somewhat challenging. Possibly it's too simplistic to be of any long term interest, but it is still worth considering as a purchase.

WORD WIZ

Company: The Programmer's Workshop
Language: BASIC
Hardware Requirements: 24K

Department: Entertainment
Sugg. Retail: $9.95
Availability: 5
Disk or Tape: Both

OVERALL RATING	B	CONTROLLABILITY	C	ERROR HANDLING	B
GAME CONCEPT	B	SKILL INVOLVED	B	DOCUMENTATION	B
CREATIVITY	C−	CHALLENGE	B	HOLDS INTEREST?	B
GAME DEPTH	A−	GRAPHICS	D+	VALUE FOR MONEY	A−

Word Wiz, a word definition game, can be played by one to four players. The game plays much like hangman, with players guessing letters in a word one at a time. The guessing continues until either the word is formed or a time limit elapses. The screen shows a grid of the alphabet on the upper left, a box containing a brief definition of a word on the upper right, and a series of boxes corresponding to the number of letters in the word in the middle. Current scoring for each player appears in the lower portion of the screen.

The sound and graphics are the very simple, no-frills variety. The definitions and words presented range from moderate to quite difficult. The number of different words on the disk is large (over one thousand) and the game can be played for hours without repeating a word. The player is not supplied with the correct answer if words are missed.

The biggest fault with the program lies in the awkward way that you must stop playing the game. After the game ends, you are asked if you wish to play another game or not. You must answer "N" for no to stop playing. If you fail to do this or if you decide to stop playing before the end of the game, the same words and definitions will repeat next time. This is extremely annoying for those of us who start a game but often get interrupted in the middle. In general, *Word Wiz* is a good game with reasonable depth.

VCS & 5200

ADVENTURES OF TRON

Company: Mattel M-Network
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $29.95
Availability: 4
Disk or Tape: Cartridge

OVERALL RATING	D+	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C-	DOCUMENTATION	C-
CREATIVITY	C-	CHALLENGE	C	HOLDS INTEREST?	D+
GAME DEPTH	D+	GRAPHICS	C+	VALUE FOR MONEY	D+

Adventures of Tron is a single-screen game where the object is to collect all seven floating bits near the I/O beam. The grid consists of four floors connected by elevators, and patrolled by Grid Bugs, Tanks, and Recognizers. These MCP attackers first appear on the top floor and snake their way to the bottom. The bright yellow I/O beam divides the center. Our hero, Tron, must constantly run and jump down floors to avoid his enemies. If he breaks the beam and moves immediately to the elevators on either side, it will take him up one level. Most of the necessary bits are on the top two levels. During the cat and mouse game of avoiding all those moving attackers, Tron usually has to jump downward to escape. He can avoid some by catching a Solar Sailer that floats high overhead. It will carry him over the advancing Recognizers to the other side of the floor.

Since the game lacks any depth, it is very repetitive. Once you collect all seven bits, you just begin again on the same screen at a slightly faster pace. The graphics are nicely detailed so that all objects from the movie are recognizable, and Tron's body is animated when he runs and jumps.

AIR RAIDERS

Company: M Network
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $30.00
Availability: 4
Disk or Tape: Cartridge

OVERALL RATING	C-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	D	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	D+	HOLDS INTEREST?	D+
GAME DEPTH	C-	GRAPHICS	C-	VALUE FOR MONEY	C-

In *Air Raiders*, an aerial combat game and one of Mattel's better cartridges, you shoot down as many enemy planes as possible without getting shot down yourself. Your plane takes off and gains altitude quickly as you pull back on the stick. The horizon tilts as you bank left or right, and the bar at the bottom of the screen tells you where you are. It also shows you the heavy flak zone that you should avoid. Soon you spot a formation of enemy planes. Sitting ducks, they never turn, fly closer, or defend themselves. You must shoot carefully to conserve your ninety-nine rounds of ammunition, because you can land to refuel only after shooting down ten planes and then only get as many bullets as the number you have shot down. The only hard part of the flight is watching your altimeter so that you don't fly into the ground while chasing enemy planes.

While this sounds exciting, the enemy planes offer no real threat. The only danger comes from the anti-aircraft flak. Too bad this game isn't more challenging—the excellent graphics make flying realistic, but they can't negate the lack of targets and tension. With improvement, the game could be a real winner.

BLUEPRINT

Company: CBS Electronics
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $25.00
Availability: 6
Disk or Tape: Cartridge

OVERALL RATING	C-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C-	DOCUMENTATION	C
CREATIVITY	C-	CHALLENGE	C-	HOLDS INTEREST?	C-
GAME DEPTH	C-	GRAPHICS	C	VALUE FOR MONEY	C

Blueprint is a cleverly conceived memory challenge game. The object is to race against time to find the pieces of a cannon that have been scattered in a maze-like neighborhood. Since you actually see the pieces as they rapidly move to the different houses, those with total recall will win this game quickly.

The trick is that the joystick controlled hero must find the pieces and reassemble them in the correct order, bottom piece first. The easiest game has only four scattered pieces, but as many as eight are hidden in advanced levels. The maze consists of ten houses; some contain pieces, others contain bombs. The corridors are patrolled by a character called Fuzzy Wuzzy. If you find a wrong piece, you have to put it back in the right house. If you find a bomb, you have to rush to the bomb bit at the lower right side of the screen and defuse it before it explodes. Once you complete your cannon, you activate it by touching the start button on the lower left. The screen switches and you must now save Daisy, who is being pursued by Ollie Ogre. Kids who like memory test games will enjoy *Blueprint*.

COSMIC ARK

Company: Imagic
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $29.95
Availability: 5
Disk or Tape: Cartridge

OVERALL RATING	D+	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	D	CHALLENGE	C+	HOLDS INTEREST?	D+
GAME DEPTH	D+	GRAPHICS	C-	VALUE FOR MONEY	D

Cosmic Ark is a mindless game of quick reflexes. It consists of two parts. First your spaceship (or ark) is bombarded by a meteor shower. To protect the ship, you shoot down meteors with guns on the four sides of your ship. This mimics an old arcade game called *Phaser Zap*, which at least required concentration to survive.

After surviving the bombardment, you proceed with your main mission, which is picking up animals (in pairs) from the various planets in the universe. You accomplish this by launching a small shuttle craft from the mothership and capturing the beasties with your tractor beam. You must hold the beam long enough or the creatures will escape. If you linger too long, the planetary defense system will zero in and destroy your shuttle. And, if the alarm sounds, you must quickly return to defend the mothership from another meteor shower.

There isn't much to this game and it gets old quickly. The graphics are plain. Each beastie looks the same and so do all the different planets. It also lacks cohesion.

DECATHLON

Company: Activision
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $34.95
Availability: 7
Disk or Tape: Cartridge

OVERALL RATING	C-	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	D	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	C	HOLDS INTEREST?	D+
GAME DEPTH	B	GRAPHICS	C-	VALUE FOR MONEY	C-

Decathlon is a VCS cartridge that lets one to four players compete in the centerpiece Olympic event, the decathlon. The fact that David Crane managed to squeeze all ten events plus the Olympic anthem into one cartridge is remarkable. On the other hand, the competition requiring repetitive joystick motion to move the runner, thrower, or jumper in nearly all ten events becomes boring way before the contest is half over. Yet in some ways, the fatigue

that occurs mirrors the agony of the actual competition.

One to four players compete in ten separate events: the 100 meter dash, long jump, shot put, high jump, 400 meter dash, 110 meter hurdles, discuss throw, javelin throw, and 1500 meter run. Since performance depends on speed of joystick movement, it is best to find the softest joystick for this test of endurance. I chose a Kraft for its quickness and ease of movement. Since only one joystick is used, each competitor has an even chance. The players take turns, each running the first event against the clock. Each player moves an animated running man on a scrolling track. Although toggling the joystick is not too demanding on the 100 meter dash, it takes nearly a minute in the 400 meter dash, and over four minutes in the 1500 meter run. It becomes sheer agony as your hand cramps and you begin to sweat.

The other events have a little more animation, especially the pole vault and high jump. Again, the staring run is made by moving the joystick rapidly back and forth, but timing is required to plant the pole and vault over the bar by pressing the button. The same is true in the high jump. The player gets three attempts to clear the bar at a set height before the bar is raised even higher. The javelin event is merely a run and throw event, while the little man just spins rapidly before releasing in the shot put event.

Perhaps I am being too critical of a VCS cartridge, but the different events are much too repetitive. Yes, there is a sense of competitiveness to the game, but this is largely an individual thing involving statistics and points. This can be accomplished best in the practice mode. But the feeling of competition that the decathlon is supposed to engender is sorely lacking in this cartridge.

DRAGONFIRE
Company: Imagic
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $29.95
Availability: 8
Disk or Tape: Cartridge

OVERALL RATING	D	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	D	SKILL INVOLVED	D	DOCUMENTATION	C
CREATIVITY	D+	CHALLENGE	C	HOLDS INTEREST?	F
GAME DEPTH	D	GRAPHICS	D+	VALUE FOR MONEY	D

The goal in *Dragonfire* is to guide a prince across a bridge into a castle to loot a treasure-filled storeroom guarded by a fire-breathing dragon. The hardest part is to get across the bridge while the off-screen dragon hurls fireballs at you. The trick is either to duck or jump just as the fireball approaches. After you master this maneuver, you can enter the castle's treasure room.

The room is guarded by a dragon that paces back and forth at the bottom of the screen. Various colored shapes representing treasure litter the room. You dash around the room and collect the treasures for points while the dragon tries to zap you with fireballs. Once all of the treasure has been collected, you exit the room and reappear back on the bridge. The scenario repeats but at a slightly faster level.

This is all there is to the game. While *Dragonfire* capitalizes on an interesting theme, the game is so simplistic that it is utterly boring. Even the graphics are poor.

THE EMPIRE STRIKES BACK
Company: Parker Brothers
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $29.95
Availability: 7
Disk or Tape: Cartridge

OVERALL RATING	C+	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C+	CHALLENGE	B-	HOLDS INTEREST?	B-
GAME DEPTH	C-	GRAPHICS	C-	VALUE FOR MONEY	C+

The Empire Strikes Back recreates the attack of the Imperial Walkers on the rebel power generator. You pilot a highly maneuverable snow speeder that fires missiles at the walkers. You try to destroy them before they reach the power generator at the right side of the battlefield, or before you lose all five of your snow-speeders. The walkers approach in single file, making your task slightly easier because you only fight one at a time, but they are hard to destroy under any circumstances. It takes forty-eight direct hits on the body, or a missile directly into one of the three

bomb hatches (identifiable by the flashing markers). As the walkers weaken, they change color, and as they slow down, they fire less often and with less accuracy. Even so, they are well armed. They can fire missiles to the rear as well as ahead, and on some levels fire smart bombs that track your speeder.

Your snow-speeder can take five hits before it is destroyed. If damaged, it indicates this by changing color. You can land in a valley for repair only twice. If you manage to keep your snow-speeder functional for two minutes, it begins to flash and you hear the theme song of the rebels. For twenty seconds the Force is with you, and you become invulnerable and able to fire at will until you destroy the walker. The radar screen at the bottom of the field tells you your location on the battlefield, and the view scrolls as you fly.

You will have some trouble learning to fly so that you can hover in front of the walker, and you must become adept to avoid or shoot down the enemy missiles. Four levels of difficulty offer variations that include smart bombs and solid walkers, which you cannot fly through (you can fly through the legs). This requires great skill in flying. *The Empire Strikes Back* obviously can't be won, but it is a fast shoot-'em-up game ideally suited for people who love *Star Wars* and don't mind the lack of depth.

ENDURO

Company: Activision
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $31.95
Availability: 8
Disk or Tape: Cartridge

OVERALL RATING	C+	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C−	DOCUMENTATION	C+
CREATIVITY	C	CHALLENGE	C	HOLDS INTEREST?	C−
GAME DEPTH	C	GRAPHICS	B−	VALUE FOR MONEY	C

Enduro reminds me of an early racing game called *Night Driver*. The road curved and zig-zagged as your car moved down the course. Activision has updated the graphics, added several hundred cars that act as obstacles during the race, and varied the driving conditions to relieve the tedium.

The object is to drive the furthest during the race. A daily goal is set for the number of cars you must pass. You lose if you don't pass 200 cars during a 24-hour period. Quotas on subsequent days are even harder. As you press the joystick button to go faster, the cars that you approach from the rear have to be avoided. If you hit a car, your car stops and nearby cars pass you. As the day goes on, the weather worsens, making it more difficult to control your car. When night comes, it is hard to see much beyond your headlights. It is best to drive slower now and more carefully.

The game is graphically well done. The road swerves back and forth and the horizon scrolls realistically as you turn. Game play leaves a lot to be desired. There is very little feel to driving the car. Except when you are on snow, the car steers normally and turns easily. The only thing you have to do is avoid collisions and endure. It isn't a bad VCS racing cartridge, but it is a bit on the boring side.

FROSTBITE

Company: Activision
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $31.95
Availability: 7
Disk or Tape: Cartridge

OVERALL RATING	C+	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	C	DOCUMENTATION	C+
CREATIVITY	C	CHALLENGE	C	HOLDS INTEREST?	C
GAME DEPTH	C+	GRAPHICS	C+	VALUE FOR MONEY	C

Frostbite is a game that has some of the same play mechanics as *Frogger*. An eskimo needs to build an igloo before he freezes in the arctic cold. Just offshore are floating rows of ice. Killer clams, Alaskan king crabs, and snow geese lurk inbetween. If they make contact, they push him off the ice. But as our hero leaps successfully from floe to floe, the ice turns blue and his igloo begins to take shape. Meanwhile, the clock is running out as the temperature falls towards zero degrees.

It is not a very simple game to win. It requires strategy to avoid becoming trapped on one piece of ice and having nowhere to jump. Also, you have to keep jumping up to avoid the hazards, which can only get you when two feet are

on the ground. On some levels the blocks get smaller, while on others more hazards appear. On the fourth level you encounter a bear that loiters in front of your completed igloo. You need to be quick to lure him off and scoot in the doorway without getting caught. *Frostbite* is an interesting, non-violent game with typically good graphics by Activision.

FROGGER

Company: Parker Brothers
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $30.00
Availability: 8
Disk or Tape: Cartridge

OVERALL RATING	**A–**	CONTROLLABILITY	**B**	ERROR HANDLING	**N/A**
GAME CONCEPT	**B+**	SKILL INVOLVED	**B**	DOCUMENTATION	**C+**
CREATIVITY	**B**	CHALLENGE	**B+**	HOLDS INTEREST?	**A**
GAME DEPTH	**B+**	GRAPHICS	**A–**	VALUE FOR MONEY	**A**

The VCS home version of *Frogger* is a nice translation of the original arcade game. Although it lacks some of the fine graphics detail, all play mechanics, action, and special features such as snakes, crocodiles, otter, lady frog, and bonus flies are intact. When the difficulty switch is set in the A position, players face a virtual duplicate of the coin-op game. The *Frogger* music plays in two-part harmony at the beginning of the game.

The object of *Frogger*, for those not familiar with the game, is to guide a frog across four lanes of highway traffic, then across a pond by leaping on the backs of floating logs, crocodiles, and diving turtles, to his home at the far side of the pond. You have to do this five times to complete a level.

The frog can hop in any of four directions by pushing the joystick in the desired direction. A timer ticks as he heads for home. He must complete the trip before it reaches zero. The turtles and logs scroll off the screen if the frog doesn't leap quickly enough. The frog croaks if it goes offscreen on the A difficulty setting, but wraps around unharmed at the B difficulty setting. The easier setting makes picking up bonus flies in the grottos a piece of cake. Bonus points can also be earned if your frog picks up the lady frog that occasionally appears on a log and escorts her home. The diving turtles can be a problem, especially if you are on one when it turns blue. This is the signal that they are going to dive straight to the bottom and take anything on their backs with them.

Each successive round features faster and more numerous vehicles, more crocodiles, and sometimes a snake in the dividing zone. Sometimes a crocodile lurks in one of the five normally empty grottos. *Frogger* is a very playable and easily controlled arcade game. It mainly appeals to children, but adults love this game, too. The designer did an excellent conversion and given the constraints of the VCS, I don't think you will be disappointed.

JEDI ARENA

Company: Parker Brothers
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $29.95
Availability: 6
Disk or Tape: Cartridge

OVERALL RATING	**C**	CONTROLLABILITY	**C**	ERROR HANDLING	**N/A**
GAME CONCEPT	**C+**	SKILL INVOLVED	**C+**	DOCUMENTATION	**C**
CREATIVITY	**C**	CHALLENGE	**C**	HOLDS INTEREST?	**C–**
GAME DEPTH	**C–**	GRAPHICS	**C+**	VALUE FOR MONEY	**C**

Jedi Arena represents a light saber battle between two Jedi knights. You try to score three victories over your opponent by directing energy bolts from a roving Seeker against a three-layer force field that acts as armor, chipping away at it. You use the paddle-controlled light saber to aim the bolts of energy, pointing the tip in the direction you wish the bolt to strike. Unfortunately, this leaves you wide open to attack, because you also use the saber to ward off bolts of energy. The game usually alternates between fast attacks and lengthy defense, but you can't wait too long before attacking again because the Seeker builds up energy and then lashes out at both players.

While the graphics lack excitement, the sound effects are realistic and add to the atmosphere of battle. Although a simple game, *Jedi Arena* does offer several levels of difficulty and the option of playing against the computer. It makes swordplay intriguing.

M✲A✲S✲H

Company: Fox
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $14.95
Availability: 5
Disk or Tape: Cartridge

OVERALL RATING	**D+**	CONTROLLABILITY	**C**	ERROR HANDLING	**N/A**
GAME CONCEPT	**C−**	SKILL INVOLVED	**C**	DOCUMENTATION	**C**
CREATIVITY	**D+**	CHALLENGE	**D**	HOLDS INTEREST?	**D+**
GAME DEPTH	**D+**	GRAPHICS	**C−**	VALUE FOR MONEY	**C**

At last the TV series *M*A*S*H* has become a video game—unfortunately, without the humor and individual personalities that made it a hit series. You guide an unarmed rescue helicopter onto the battlefield where you pick up wounded troops and transport them back to the operating room. A tank at the bottom of the screen spews shells into the air, but you can't shoot back, you can only avoid getting shot down.

Once you touch down at the 4077th, you become a surgeon. It is time to operate. You must remove the bullet lodged in your patient and move on to the next, having only fifteen seconds to save as many lives as possible. Luckily, the pear-shaped soldiers already have maze-like tunnels throughout their bodies, making it possible for you to guide the bullet out without touching a wall with your forceps.

You can play against a human or computer opponent. Both of you race around the screen in an attempt to rescue as many of the wounded as possible, and from time to time, the scene shifts to the operating room for fifteen seconds. You play for a specific time (999 points) rather than according to how many helicopters have been shot down or how many lives you have saved. Eventually, you just get bored.

MS. PAC-MAN

Company: Atari
Language: Machine
Hardware Requirements: 5200

Department: Entertainment
Sugg. Retail: $35.95
Availability: 6
Disk or Tape: Cartridge

OVERALL RATING	**A**	CONTROLLABILITY	**C−**	ERROR HANDLING	**N/A**
GAME CONCEPT	**A**	SKILL INVOLVED	**B**	DOCUMENTATION	**B**
CREATIVITY	**A**	CHALLENGE	**A**	HOLDS INTEREST?	**A**
GAME DEPTH	**B**	GRAPHICS	**A−**	VALUE FOR MONEY	**B+**

Ms. Pac-Man faithfully recreates the popular coin-operated version. Unlike the *Pac-Man* cartridge, the maze does not fill the screen but instead is nearly square with black margins. The cartridge contains all four mazes and at least three cartoon intermissions. The female dot-eater, adorned with a bow and ribbon and long eyelashes, must outwit four friendly ghosts to munch all of the dots on the maze floor. The dot energizers in the corners let you momentarily turn the tables on Inky, Blinky, Pinky, and Clyde. Bonus fruit wanders throughout the differing maze levels, and the maze has four crossover exits. Any ghost patterns are nearly useless in this game.

You may have trouble controlling things and find yourself running into the ghosts more than once. Most of the trouble develops at slower speeds in the easiest levels. Once your heroine begins to speed up on the more difficult levels, the control problems smooth out. The translated version for home computers works better, but still can't match the reliable control of the original *Pac-Man*. Despite this, I thought the game exceptionally well done, with excellent graphics. It runs smoothly, with no flickering, and should achieve the popularity of the arcade version.

NO ESCAPE

Company: Imagic
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $29.95
Availability: 6
Disk or Tape: Cartridge

OVERALL RATING	**C+**	CONTROLLABILITY	**C+**	ERROR HANDLING	**N/A**
GAME CONCEPT	**B**	SKILL INVOLVED	**B−**	DOCUMENTATION	**C**
CREATIVITY	**C**	CHALLENGE	**B**	HOLDS INTEREST?	**C+**
GAME DEPTH	**C+**	GRAPHICS	**C**	VALUE FOR MONEY	**C+**

No Escape combines elements of a shoot-'em-up game and *Breakout*. Jason is trapped in a temple with a column of six dangerous furies hovering overhead. The temple roof consists of colored bricks, much like those in *Breakout*.

You fling rocks at the falling bricks in an attempt to knock them into a position to kill the furies without harming Jason. You must be careful, because if you accidentally hit a fury with a rock, it will clone itself to replace one of its dead sisters.

While the game is simple, it takes some effort to figure out the patterns of movement of the furies and the falling bricks. As the game progresses, the patterns change and the furies become quite adept at dodging the bricks. On upper levels, they can even shoot back. The best technique is to sling several rocks at once so that they can't avoid all of the falling bricks. As the column gets further from the temple roof, you may find it difficult to kill the last fury.

The game's four skill levels let you start further into the game if you wish. *No Escape* offers challenge, but I doubt it would hold your interest for long unless you get caught up in the play dynamics or try to rack up a new high score.
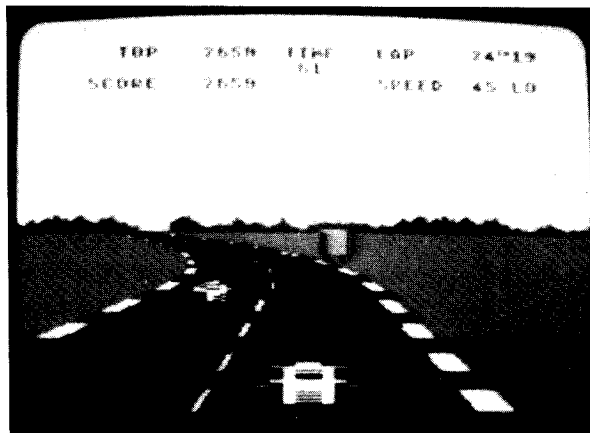
POLE POSITION

POLE POSITION
Company: Atari
Language: Machine
Hardware Requirements: 5200

Department: Entertainment
Sugg. Retail: $40.95
Availability: 8
Disk or Tape: Cartridge

OVERALL RATING	A	CONTROLLABILITY	B+	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	A	DOCUMENTATION	B
CREATIVITY	B	CHALLENGE	A	HOLDS INTEREST?	A
GAME DEPTH	B+	GRAPHICS	A	VALUE FOR MONEY	A

Atari has done a magnificent job in translating *Pole Position* their top racing arcade game, to the 5200. It is a racing game in which you must qualify on the track before you are allowed to race. You have up to 90 seconds of qualifying time, but must complete the lap in less than 74 seconds if you are to race. The computer then determines your starting pole position. If you get stuck at the back of the pack, you will have to do some fancy maneuvering to get out ahead.

The game's graphics are simply outstanding. The perspective view is as if you were towed fifty feet behind your car ten feet off the ground. The roadway is blacktop with red and white stripes delineating the boundary from the surrounding countryside. As you follow the twisting, turning roadway using your joystick controller, the trees on the horizon and the clouds in the sky scroll by. Roadway signs appear in the distance and gradually become larger. Unlike the arcade version, these signs are blank. The sound effects are engine revs, a different pitch for each gear. There is even the screeching sound as you corner hard and the bumpy sound of riding on bricks if the car ventures slightly off the pavement.

The game is controlled by a joystick. One button is the accelerator, the other acts as a brake. Pushing the joystick forward puts the car in low gear, and pulling back puts the car in high gear. Speeds as high as 195 MPH are possible on long straightaways. However, you will have to brake or downshift if you expect to navigate a tight turn. Avoiding the other cars on the track requires practice.

There are three different racing courses in addition to a practice course. You can select up to an eight-lap race, but you must complete each lap within a certain time or you won't reach the next lap. *Pole Position* is definitely the most realistic racing car arcade game on the market and a must buy for any racing fan.

PORKY'S

Company: Fox Video
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $19.95
Availability: 7
Disk or Tape: Cartridge

OVERALL RATING	B-	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	B	DOCUMENTATION	C-
CREATIVITY	C	CHALLENGE	B	HOLDS INTEREST?	C
GAME DEPTH	B	GRAPHICS	A-	VALUE FOR MONEY	B

The game, like the movie, chronicles the attempts of Pee Wee to blow up the famous Porky's Bar. The game has five separate and well-done scenes, but a rather disjointed action. First, Pee Wee must cross seven lanes of a highway at County Line to reach Porky's Bar. This portion resembles *Frogger* and is deliberately difficult. Each time he gets hit he lands in the swamp. To escape the swamp he must pole vault to a platform where he can collect bricks to build an escape ladder. The instructions here are very vague. What you need to do after mastering the pole vault technique is to take a brick from the platform on one side to the platform on the other side. When you touch the wall, the ladder becomes higher. From a total of eight bricks, getting four on one side will allow you to climb out. The difficulty is learning to pole vault: if you miss, you are in the drink minus the brick.

Once out of the swamp, it's on to the movie's famous shower scene. Mazes made up of dashed lines serve as ladders. Pee Wee's task is to climb the ladders to reach a tool atop the shower and push it into the hole at the bottom. Trouble is that if he looks at the naked lady in the shower, Mrs. Balbricker appears, chases him around the maze, and throws him back into the swamp when she catches him. If Pee Wee is successful, he can climb back up to the highway where an additional lane of traffic has been halted.

Sooner or later, Pee Wee reaches Porky's Bar, comprised of a maze of scaffolding. There is only one way up. An arrow on the left indicates whether you are on the right path. A red arrow means you must go back to the bottom and try a different path. Porky, the bar's owner, is on the prowl, and when he catches you, it's back in the swamp. If you make it up the scaffolding you are rewarded with an animated sequence in which a dynamite plunger blows up the bar.

This program has superior animation for a VCS game. The scene with the girl wiggling in the shower and Pee Wee's pole vaulting attempts are both particularly well-animated. But if the graphics are superior, the sound effects are annoying.

The game play, as I mentioned earlier, is a little disjointed. You feel as if you are playing separate games that are only tenuously linked together. There are several levels of difficulty, but even on the easiest levels, if you are inept in navigating the shower ladders, you will be thrown back into that frustrating swamp again and again until you no longer want to play.

REAL SPORTS SOCCER

Company: Atari
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $30.45
Availability: 7
Disk or Tape: Cartridge

OVERALL RATING	D	CONTROLLABILITY	C	ERROR HANDLING	N/A
GAME CONCEPT	C	SKILL INVOLVED	D+	DOCUMENTATION	B
CREATIVITY	D	CHALLENGE	C-	HOLDS INTEREST?	D
GAME DEPTH	D	GRAPHICS	C	VALUE FOR MONEY	D

Real Sports Soccer disappointed me with its lack of realism. Three players make up each of the competing teams, sans goalie. You control one player at a time; the rest drift after the action. You try to bluff, pass, and out-maneuver your opponent to get near your goal. To score, you simply have your player kick the ball into the empty net.

You control your player by joystick. When on the defensive, you can change players by pushing the button. If on the offensive, you can pass to your opponent by pressing the button and pushing the joystick in the desired direction. The soccer players look realistic and are animated when they run. The playing field, about three screens wide, scrolls as the game moves. Unfortunately, *Real Sports Soccer* fails to copy the real game; it lacks the complexity and players to hold anyone's interest.

REAL SPORTS BASEBALL

Company: Atari
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $30.45
Availability: 8
Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C+	DOCUMENTATION	B+
CREATIVITY	B-	CHALLENGE	C-	HOLDS INTEREST?	B-
GAME DEPTH	B	GRAPHICS	B	VALUE FOR MONEY	B-

Real Sports Baseball, a very playable and well-designed baseball game, features one or two players in competition, a nine-player team, batting and pitching control, base stealing, and the ability to throw the ball around the infield with complete control. The well-done graphics show a perspective of the field from above and behind the plate. The outfield looks shallow, but you can't have everything. The pitcher throws four different pitches: a fastball, riser, sinker, and an intentional pass to walk the batter. Unfortunately, the batter can't judge the pitch very well although he can use the joystick to adjust his swing. He can hit high or low to either left or right field, bunt, and easily hit a home run. When running the bases, the player can advance or retreat, even steal. Outfielders can field grounders, or catch fly balls. Choose the proper base to throw to by pushing the joystick in one of four directions (the same as for the pitcher; up for second, left for first, and so on). If the intended receiver misses the catch, the ball rolls and comes to a stop on the field. You just move your player over to pick up the ball and hope you have enough time to tag the runner out.

The game possesses four variations, two one-player games and two two-player games. The major difference is that in the former, the batter can attempt to hit any pitch, while in the latter, he can't hit balls outside of the strike zone. The game's graphics have vastly improved over the old *Home Run* cartridge. The baselines are brown against the green grass field, and the players are animated when they run. While not the best baseball, the game is very playable. Not a disappointing cartridge at all.

REAL SPORTS FOOTBALL

Company: Atari
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $30.45
Availability: 8
Disk or Tape: Cartridge

OVERALL RATING	A	CONTROLLABILITY	A	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	B	DOCUMENTATION	B+
CREATIVITY	B	CHALLENGE	B	HOLDS INTEREST?	A
GAME DEPTH	A-	GRAPHICS	B+	VALUE FOR MONEY	A

Real Sports Football is an outstanding VCS sports simulation for one or two players. Each team consists of five players, one of them directly controlled by your joystick. If offense, you control the quarterback; if defense, the safety. The other players follow the movements necessitated by the selected play. You choose the play by moving the joystick in the required direction. A flashing indicator at the top tells you if a play hasn't yet been chosen. The offense can choose long or short passes (left or right), running plays (left or right), or kicking. The defense can cover short or long pass plays and anticipate the direction the play will move. Once the quarterback throws, the ball travels automatically. Control then switches to the eligible receiver, who you move to catch the pass. The defensive player has slightly more speed than the ball carrier, and can usually tackle him on a short run. He encounters more trouble against a long lead. Running plays against the computer are difficult, and your best bet is to tangle the linebackers with blockers.

The game follows the rules of football fairly closely. Exceptions are no kicking for extra points, no time out, no fumbles, no penalties, and no running out-of-bounds. The clock runs continuously during play and stops after incompleted passes. It also stops for scores, turnovers, dead balls, and while the offense calls the play. It resumes with the hike. The clock won't stop for more than thirty seconds, so you cannot intentionally delay the game. You can play at one of two difficulty levels, both of which control the runner's speed. This helps balance the contest between unequal opponents.

The graphics are quite good in this game. The screen shows only about twenty yards of field, but the ten yard lines

scroll as the ball carrier moves down the field. The players are animated when they run, and although noticeable flickering occurs during play, I did not find it bothersome. Game play is surprisingly good, and offers enjoyment over an extended period of time. I would definitely recommend the game to football fans, as it may well be the best sports simulation cartridge available on the Atari VCS system.

REAL SPORTS VOLLEYBALL

Company: Atari
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $30.45
Availability: 7
Disk or Tape: Cartridge

OVERALL RATING	C+	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	C+	SKILL INVOLVED	C	DOCUMENTATION	B
CREATIVITY	C	CHALLENGE	B	HOLDS INTEREST?	C
GAME DEPTH	C	GRAPHICS	C	VALUE FOR MONEY	C

Real Sports Volleyball simulates beach volleyball, in which just two players make up a team. Your perspective is high and from the side, the players in profile. The net runs down the middle of the screen from top to bottom, and the ocean lies in the background. You control the players with a joystick.

The two players of each team seem to move in tandem on their half of the court. You need only position the player under a descending ball for him to hit it. If the player stands very close to the net, pushing the button enables him to spike the ball. The shadow under the ball helps you determine how high it is and thus calculate the proper hit. You can play the game against the computer or a human opponent, with a choice of two play levels. One the harder level, your players must hit the ball twice before sending it back over the net to the opposing team.

Scoring is very realistic. Only the team that serves can score points; if the other team wins the volley, they gain the right to serve. The first team to score fifteen points wins the game. With a little practice, people who like beach volleyball can happily play this indoor substitute on a rainy day.

ROBOT TANK

Company: Activision
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $34.95
Availability: 8
Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	C	CHALLENGE	C+	HOLDS INTEREST?	B
GAME DEPTH	C+	GRAPHICS	A−	VALUE FOR MONEY	B−

The object of *Robot Tank* is to steer your tank around a desert battlefield in a search and destroy mission. It seems a large number of robot tanks are on the loose and are no longer taking orders.

Your tank is joystick controlled. A radar screen shows the relative position of enemy tanks, while your viewscreen helps you line up the gun turret's crosshairs on the enemy tank. Shooting a tank is simple, you just lead slightly with your gun. The tanks aren't too aggressive. You usually have several chances to nail one before it turns and fires. Their shots are more likely to damage your tank than destroy it. (Your gun turret or your radar or visual scanner may be knocked out.) The appropriate indicator will flash when the tank is damaged. The battle lasts throughout a 24-hour period, meaning you will have to fight at night or in morning fog when the visibility is poor.

The game has excellent graphics and the screen is elaborate. A radar screen and various warning lights grace the bottom. The terrain has a mountainous background and a striped desert floor. The combination of these stripes moving forward, and the horizontally scrolling mountains gives the game a sense of motion. The sky turns from day, to a beautiful sunset, to pitch black as night falls. One of the more unusual effects is the explosion when a tank is destroyed. It looks like an electrical malfunction of the computer.

Frankly, the game wouldn't have been much of a challenge if it weren't for the 24-hour battle cycle giving the player a feeling of progression. Night fighting is dangerous. The enemy tank is alerted to your position when you fire. Since it is difficult to shoot by radar alone, it is best to evade the enemy until dusk. Sometimes daylight weather

makes the game challenging. Fog impairs visibility, and rain or snow slows down the tank treads.

Since bonus tanks are awarded for every twelve tanks destroyed, a good player may last indefinitely despite the enemy becoming more aggressive as the game progresses. The game has its moments, but with its minimal strategy the game is nothing more than a nice looking shoot-'em-up game.

SOCCER

Company: Atari
Language: Machine
Hardware Requirements: 5200

Department: Entertainment
Sugg. Retail: $32.95
Availability: 7
Disk or Tape: Cartridge

OVERALL RATING	A	CONTROLLABILITY	B-	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	B	DOCUMENTATION	C+
CREATIVITY	B	CHALLENGE	B+	HOLDS INTEREST?	A
GAME DEPTH	B	GRAPHICS	B	VALUE FOR MONEY	A

The *Soccer* cartridge for the 5200 is an outstanding sports simulation for one or two players. It features a very large scrolling playfield with five players, four fielders, and one goalie on each team. You control one player at a time, so team members who don't have the ball are programmed to follow the play action. The goalie handles the net exceptionally well, but you have no control over him. He will stop most shots except a high offside kick to the net's corner.

Each player controls only one detailed and animated player indicated by a brighter team color. That player can dribble the ball down field using the joystick, or pass by kicking. You can choose low, medium, or high kicks with the keyboard controller. The ball has a shadow so you can tell that it is lofted into the air. The effect is even more dramatic when the goalie makes a save and kicks it high into the air towards the center of the soccer field. It even bounces several times. The defensive player can switch the man he controls by pressing the Switch Player button on the keyboard. It usually switches to the person closest to the player dribbling the ball. When the ball goes out of bounds, the players move into position for a throw-in or corner kick.

Soccer is best played with two players, although one player can play against the computer on any of three levels. The game is played in halves that are adjustable from five to forty-five minutes. The game has excellent graphics, smooth play, and is exciting and engrossing to play. If you like sports games, this is the definitive soccer game on the market.

STRAWBERRY SHORTCAKE

Company: Parker Brothers
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $30.00
Availability: 6
Disk or Tape: Cartridge

OVERALL RATING	B-	CONTROLLABILITY	B	ERROR HANDLING	N/A
GAME CONCEPT	B-	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	B	CHALLENGE	C	HOLDS INTEREST?	B
GAME DEPTH	C	GRAPHICS	B-	VALUE FOR MONEY	B-

In *Strawberry Shortcake: Musical Matchups*, a charming children's game for four to eight year olds, you must reassemble Strawberry and her friends, whose bodies have been scrambled by the evil Purple Pieman. Luckily, each body has three separate portions (head, body, and legs) and can be put back together fairly easily. In the simplest level, the child chooses only one part with a vertical movement of the joystick, then cycle through the other choices by moving the joystick horizontally. When the child has put together a complete character (Strawberry Shortcake, Blueberry Muffin, Lime Chiffon, Huckleberry Pie, and the Purple Pieman), pressing the button causes the character to dance to its own musical tune. If all the parts fit correctly, all three parts of the tune play; otherwise, a jumbled tune made up of the characters' tunes for the parts chosen plays. If the parts match, the character's name appears followed by a new jumbled character to reassemble.

The game offers a number of skill levels ranging from assembling any character to assembling a specific character, timed games at various speeds, and games with musical clues. The child can refer to the pictures in the instruction manual at any time to see what the characters look like.

SUPER COBRA

Company: Parker Brothers
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $29.95
Availability: 7
Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	B−
CREATIVITY	C	CHALLENGE	B	HOLDS INTEREST?	B−
GAME DEPTH	B	GRAPHICS	C+	VALUE FOR MONEY	B

You are the pilot of an attack helicopter doing surveillance over 10,000 miles of scrolling enemy territory in *Super Cobra*. The enemy has ground artillery, rocket, mines, fireballs, and fuel depots throughout its territory. As the screen scrolls, you maneuver your joystick-controlled helicopter over mountains and through narrow tunnels. Some of these passageways are so narrow you must alternately accelerate and decelerate to maximize your vertical movement. This navigational technique takes practice. Your helicopter is equipped with both missiles and bombs that fire alternately. This makes it much harder to hit the fuel depots with bombs.

There are eleven scrolling sections to the game. The first few are fairly easy; ground artillery and rockets don't begin firing simultaneously until level four. The flying fireballs fly in predictable patterns, but when the mines begin dropping bombs in level seven, things get difficult. The goal is to eventually reach level eleven and pick up the booty by swooping down and landing on it. You get four choppers, but I guarantee you will never reach level eleven with just those four. However, you can eventually reach higher levels by pressing the fire button immediately after the game ends, so you start at the beginning of the last level next time you play. I have known people who have played this game for over an hour in order to reach the end.

The game is interesting, exciting, and has good depth to hold your interest. The graphics are fair, but the scrolling is a little jerky. The terrain is cubic with horizontal lines delineating the solid areas. The bombs fall straight down, rather than arc.

TENNIS

Company: Atari
Language: Machine
Hardware Requirements: 5200

Department: Entertainment
Sugg. Retail: $32.95
Availability: 7
Disk or Tape: Cartridge

OVERALL RATING	A	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	A	SKILL INVOLVED	B+	DOCUMENTATION	C+
CREATIVITY	B	CHALLENGE	A−	HOLDS INTEREST?	A
GAME DEPTH	B	GRAPHICS	A−	VALUE FOR MONEY	A

Tennis for the 5200 is the best tennis cartridge around. It offers you an arsenal of different shots that you select with the keyboard controller. The nine number keys are set in the same pattern as your opponent's side of the court. This reintroduces the element of strategy that other tennis games lack, letting you draw your opponent out of position, move up to the net, and smash the ball down the opposite alley. You maneuver the players around a detailed court by using the joystick. To return a volley, you simply move the character in front of the ball to hit it. You might have some problem remembering to press the right button without taking your eyes off the ball, but not to worry—if you miss, the ball either repeats your last command or returns to center court at medium speed. Serving the ball is also realistic. You lob it high into the air and hit it into your opponent's service area with moderate force, either to his forehand or backhand. The ball's shadow lets you know its height.

You can play *Tennis* against a human or computer opponent. I would recommend practicing only against the computer, as playing against it can bruise your ego. Because your computer-controlled opponent is programmed to always follow the ball, he rarely misses. With practice, you can play with the skill and strategy of a tennis professional. Although you can't ever hit into the net or out of bounds, you might appreciate this lack of realism because it removes much of the frustration associated with tennis. It may even be the reason that you moved indoors to play *Tennis* in the first place. Whether you watch or play, this game is exciting. Playing it on my six-foot screen was like watching the Wimbledon finals. *Tennis* is truly an outstanding sports cartridge.

TUTANKHAM

Company: Parker Brothers
Language: Machine
Hardware Requirements: VCS

Department: Entertainment
Sugg. Retail: $29.95
Availability: 7
Disk or Tape: Cartridge

OVERALL RATING	B−	CONTROLLABILITY	C+	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	B−	DOCUMENTATION	B−
CREATIVITY	C	CHALLENGE	B+	HOLDS INTEREST?	B−
GAME DEPTH	B−	GRAPHICS	C−	VALUE FOR MONEY	B−

As an explorer in the Boy King's tomb, you have to find and recover treasure located in each of the four different chambers. Your ultimate goal is *Tutankham's* death mask located behind the last door in the final chamber. To get there, you need to explore each of the chambers within a time limit while under attack by cobra snakes, desert scorpions, vicious turtles, and spirits of the gods.

The archeologist is joystick controlled. As he moves through the passageways, each maze begins to scroll. Some of the passageways appear to be dead ends, but secret corridors link them to others. The object is to find a key allowing you through the door connecting the different chambers. Creature nests are scattered throughout the maze. You can kill the creatures with your laser gun, but it only shoots horizontally. This limitation dictates your strategy. There are three laser flashes for dire emergencies. They will annihilate all creatures on your portion of the maze floor.

The graphics in the coin-op version of this game did much to enhance its popularity. Unfortunately, in the cartridge, much of the detail was replaced by colored bands and barely recognizable characters. To make up for it, they increased the playability and action by adding countless numbers of monsters that appear at will.

VANGUARD

Company: Atari
Language: Machine
Hardware Requirements: 5200

Department: Entertainment
Sugg. Retail: $40.95
Availability: 9
Disk or Tape: Cartridge

OVERALL RATING	B	CONTROLLABILITY	B−	ERROR HANDLING	N/A
GAME CONCEPT	B	SKILL INVOLVED	C	DOCUMENTATION	C
CREATIVITY	B−	CHALLENGE	B	HOLDS INTEREST?	B−
GAME DEPTH	B+	GRAPHICS	B−	VALUE FOR MONEY	B

Atari did an admirable job in translating the coin-op version of *Vanguard* to the 5200. The game is an intense shoot-'em-up that takes place in a long underground scrolling tunnel consisting of many different zones. Your ship remains under continual attack, but you can defend yourself by shooting in any of four directions using a unique firing mechanism. Although you are forced to fly forward due to the constant scrolling, you shoot in the direction that you maneuver your ship. This technique often endangers your ship, especially in the Rainbow Zone, but it gives you more scoring possibilities. This aspect of the game differs greatly from the four button firing mechanism used in the coin-op version.

All the sections of the tunnels are different. In the first, flying across an energy pod makes your ship invulnerable for a period of time. Your ship can safely ram the enemy but the firing mechanism is disabled. The theme from the movie *Flash Gordon* plays through this sequence. The Styx Zone has numerous obstructions along its tunnel. You must fly carefully while clearing a path through the enemy formation which advances and fires on your position. The Rainbow Zone is perhaps the hardest because of the constant barrage of balloons that surround your ship. These zones occur on the three diagonals in the tunnel. The Stripe Zone is full of obstacles, yet the Bleak Zone is wide open flying. And if you finally manage to reach the Gond in the last zone, you can blow it up.

The game is action-packed and rarely lacks targets. The long tunnel is hard to complete with only five ships. However, you can continue where you last left off by pressing the trigger rather than the Start button which resets the score to zero. This is an endearing feature to those who are curious and wish to see the entire tunnel the first time they play. The graphics are nearly as good as the coin-op version, but with a lot less color. The music from *Flash Gordon* complements the game, and I'm certain that even the hardened arcade fan will like this home computer version of *Vanguard*.

1200 BAUD MODEM COMPARISON

	HAYES SMARTMODEM 1200	SIGNALMAN MK 12	US ROBOTICS PASSWORD
LIST PRICE	$699.00	$399.00	$449.00
BAUD RATE	#00—1200 BPS	300—1200 BPS	300—1200 BPS
DIRECT CONNECT	YES	YES	YES
AUTO-ANSWER	YES	YES	YES
AUTO-DIAL	YES	YES	YES
DETECT BUSY SIGNALS & DIAL TONES	NO	YES	NO
SPEAKER BUILD-IN	YES	NO	YES
INDICATOR LIGHTS	YES	YES	NO
RS-232C PORT COMPATIBILITY	YES	YES	YES
CONNECTOR	DB25—FEMALE	DB25—MALE	DB25—MALE
AUTOMATICALLY ADJUSTS TO TRANSMISSION SPEED	YES	YES	YES
FULL & HALF DUPLEX	YES	YES	YES
ASYNCHRONOUS	YES	YES	YES
BELL 103 COMPATIBLE	YES	YES	YES
BELL 212A COMPATIBLE	YES	YES	YES
DEFAULT ECHOES TO SCREEN	YES	YES	NO—MUST TURN ON
COMPATIBILITY WITH HAYES SOFTWARE	YES	95%	90%
PULSE OR TONE DIALING	BOTH	BOTH	BOTH

1200 Baud Modems

One of the media buzz words over the last year, telecommunications, means the ability of one computer to talk to another over standard telephone lines. Industry transfers great quantities of data on special telephone "packet lines." Personal computer owners obtain data from commercial services like *Compuserve, The Source,* and Dow Jones, or communicate with others via free bulletin board systems (BBS). Because both systems feature electronic mail, users can leave messages either for the general public or for specific individuals. Some people use modems to swap files and disks, while others hook their computers to larger mainframes at colleges or at work for use as "dumb terminals." The future holds great promise for even more uses. As microcomputers and modems become common in the home, for example, local banks will offer electronic banking by telephone.

As users expand their search for useful databases and encounter toll and long distance telephone charges, speed of data transmission and thus telephone connect time becomes more important. As a result, the slower 300 baud systems are being replaced by 1,200 baud systems (or higher) to cut costs. For this reason, we decided to concentrate on testing 1,200 baud modems instead of the older, more widely used 300 baud units even though these modems cost two to three times more than 300 baud modems. The difference in cost comes about because 300 baud modems use a technique called frequency key shifting (FSK) in which data is modulated over a carrier frequency. It requires a band width of only 1.5 times the baud rate, but twice that if the unit operates in the two-channel full duplex mode. The telephone offers a range from 700-3,000 HZ, or a band width of 2,300 HZ. While adequate for a 300 baud modem, it isn't wide enough for a 1,200 baud modem. You would need a band width of 3,600 HZ if you included the guard bank between the two channels.

A high speed modem requires an alternate modulation technique. Manufacturers chose a four-level phase shift keying method (PSK) which increases the effective baud rate by encoding two data bits per baud. This does not mean only a two-fold increase in speed—the baud rate is the modulation rate of the carrier. The modem is rated for transfer at 1,200 bits per second. In essence, the increased bit rate requires transmitter and receiver circuits of greater complexity and higher cost. Some of the complexity comes from the increased sensitivity to noise and distortion over the telephone lines and must compensate for them.

Three manufacturers agreed to submit their best units for evaluation. Several others, including Novation and Cermetek, declines. The latter, a new company in the modem field, has experienced considerable start-up problems with their new unit. Novation, an older company which has received bad press in the past for setting their own standards, just wasn't interested.

Since a substantial amount of communications software has been written with the Hayes protocol in mind, both Signalman and U.S. Robotics advertise their units as virtually Hayes compatible. Actually, they are 90-95% compatible, but subtle differences make several customwritten public domain "hacker" programs inoperable. The two most commonly used terminal programs, *Tele-Talk* by Datamost and *A-Modem Plus* in the public domain, worked flawlessly with all modems. Both are popular because they perform a checksum on the sector data transmitted, verifying that the program being sent will indeed work when received at the other end. While *Tele-Talk* is limited to transferring files of about 210 sectors, *A-Modem Plus* saves data every eight sectors and can save files nearly as long as the disk. A 135-sector file takes about four minutes to transfer at 1,200 baud and sixteen minutes at 300 baud.

Hayes Smartmodem 1200

Hayes features the best selling and most popular modems on the market. Their popularity arose several years ago when they began offering features like auto-dial/auto-answer and direct connect instead of the old fashioned acoustic coupling. So many software houses began writing telecommunication programs using the Hayes commands that their general use spread throughout the industry.

The unit is the Cadillac of modems and has a price to match. It is housed in a metal case 15″ x 5 ½″ x 1 ¼″. It has eight LED indicator lights behind a detachable, smoked-glass front plate. The configuration switches are set behind the plate. You can use these to disable auto answer, echo characters in the command mode, or send result codes to the printer. The rear has a toggle power switch, a female RS-232C connector, telephone connection, and a volume control for the internal speaker. The speaker is useful for monitoring the progress of the auto dialing without the need for a phone.

Using the modem in the terminal mode is quite simple. If you wanted the modem to auto-dial a local Bulletin Board System (BBS), you would give it the command ATDT 555-1212. The last "T" stands for touch-tone, but you can also use pulse dialing. Commas are used for pauses, useful if you are waiting for the computer tone when calling your local Sprint or MCI numbers. If the line were busy, you could call again later with the repeat command, A/. Unfortunately, this modem cannot detect a busy signal—essential if you were writing a demon-dialer program. It just doesn't connect if the line is busy. It does, however, detect the other modem's baud rate and adjusts accordingly while sending an extended result code and a message to the baud rate of its present operation. If you are in voice contact and you wish to connect the modems, one party will send an answer carrier ATA, and the other an originate carrier ATD. The command ATH hangs up the phone.

The eighty-page, spiral-bound manual is very technical, yet informative and complete. It is especially useful if you are writing your own software. Fortunately, most users need only read a small part to run the modem.

U.S. Robotics — Password

The Password is housed in a no-frills, small plastic case measuring 7 ½" x 4 ½" x 1 ¼". There are no LED status lights, but there are four DIP switches in the rear useful for setting auto-answer and data terminal ready modes. The rear also has a sticky and cheap slide switch, a male RS 232A connector, and a telephone connector. The unit contains a marginal pager speaker that sounds terrible. The cheap exterior prompted me to examine the interior. Don't let the exterior fool you—the quality circuit board on the inside is well laid out.

The unit can auto-dial and auto-answer and follows the Hayes protocol of commands. It defaults to no echo, so that you can't see what you are typing. This can be corrected with the command ATE1. The unit isn't entirely Hayes compatible, but works fine with the commercial telecommunications packages that I tested. It has trouble with a few custom written Hayes programs, although I could not determine the reason for this. Because it can't detect a busy signal, it can't be used as a demon-dialer.

The documentation, finally, consists of fifteen printed pages stapled together. While it isn't fancy, it is readable and useful to the first-time user.

Signalman Mark XII

This 1200 baud auto-dial, auto-answer modem is a much less expensive alternative to the Hayes modem. As such, it doesn't have the most sophisticated housing or even a built-in speaker. The plastic case is about the same size as the Hayes unit: 9 ½" x 6" x 1 ½". It has four LED indicator lights and an On/Off rocker switch on the front. The two modular phone jacks on the rear eliminate the need for a spliter—the unit plugs into the phone jack and the phone plugs into it. The modem connects to your system via a male RS-232A connector plug at the end of a one-foot long ribbon cable. There are no switches for changing the default settings which are 1200 baud, full duplex, and auto-answer. This is accomplished entirely by commands.

The modem is generally Hayes-compatible. It worked on all commercial software that I tested; however, I had a problem with the one custom hacker program written for the Hayes (this may just be a matter of timing in the disconnect mode). The Mark XII does have several additional operational features. It can detect a busy signal and be programmed as a demon-dialer. Since it automatically detects and adjusts for the baud rate of the modem on the other end, it sends the proper result code and prints the connect baud rate to the screen.

The twenty-nine page looseleaf documentation was marked "preliminary." The manual is highly technical in nature with pages of commands and result codes. I think the lack of any clear-cut examples will make it difficult reading for beginners.

Conclusion

You can usually judge a product based on price versus performance and features. As to performance, each of the three modems performed up to their claims in the 1200 baud mode. I found no differences when sending or receiving Atari DOS files; files that were sent came back in working order. The Hayes is extremely popular but expensive. It also has the advantage that most software was written for it, and the resale value for a Hayes is very good. The Signalman is the least expensive, with no speaker and a cheap case. The ability to detect busy signals is a very good feature that the other modems lack. The U.S. Robotics unit, finally, is priced somewhere in-between. It has no pretentious frills and doesn't even sport status lights. Software compatiblilty with the Password is less than for the Signalman modem, but it still uses the valuable Hayes protocol.

SOFTWARE VENDORS

Acorn Software Products
634 North Carolina Avenue
SE Washington, DC 20003
(202) 544-4259

Activision, Inc.
5221 Bayshore Frontage Road
Mountain View, CA 94039
(408) 942-1370

Adventure International
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Longwood, FL 32750
(305) 862-6917

Alog Computing
1040 Veronica Springs Road
Santa Barbara, CA 93105

Amulet Enterprises, Inc.
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Garfield Heights, OH 44125
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APX (Atari Program Exchange)
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Atari, Inc.
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(408) 942-1900

Bit Better Software
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(304) 754-8937

Broderbund Software, Inc.
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San Rafael, CA 94903
(415) 479-1170

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Hangertown, MD 21740

CDY Consulting
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(716) 467-9326

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(408) 745-0700

Fox Video Games, Inc.
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Santa Clara, CA 95050
(408) 988-6666

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Infocom, Inc.
55 Wheeler Street
Cambridge, MA 02138
(617) 492-1031

Innovative Design Software
P.O. Box 1658
Las Cruces, NM 88004
(505) 522-7373

Intelligent Statements
Box 3558
Chapel Hill, NC 27514

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University of California
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(415) 642-3167

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Paso Robles, CA 93446
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OSS (Optimized Systems Software)
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San Jose, CA 95129
(408) 446-3099

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50 Dunham Road
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PDI (Program Design, Inc.)
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(919) 967-0861

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Arlington Heights, IL 60004
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(617) 868-4700

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(800) 331-4768

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