

NIBBLES & BITS



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DESIGNED and PRINTED with the amazing ADAM™ computer (using PowerPAINT, SpeedyWrite, and ShowOFF II).

PUBLIC NOTICE

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GENERAL INFORMATION

Most issues include a special offer on software purchases; these are explained as time limited offers. If you receive N&B outside the North American continent (Australia, Isreal, England, and South Africa, for example), we will extend these deadlines to you by 30 days.

If you have products or services of interest to ADAM owners, please let us know. We try to keep our readers apprised of all the latest news concerning the ADAM. We also offer half page (7" across by 4.5" down) commercial advertising slots for \$50.00 per issue (effective April 1, 1988). "Camera ready" artwork must be received at least 30 days prior to the first day of the issue month. Circulation: 2400+.

Product orders are processed within 48 hours of receipt. Where possible, orders are shipped via UPS. Backordered items are shipped at our expense. Order processing may be delayed by legal and traditional holidays. C.O.D. orders (via our BBS) add \$2.50 for the service.

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ADAM NEWS AND UPDATES



□□□ COVER GRAPHICS: The ADAM computer system on our cover was designed with PowerPAINT and donated by BRYAN'S SOFTWARE. Our new return address logo was created by the design team at DIGITAL ADVENTURES.

□□□ Walter's Software plans to release their graphic printing utility PrintWORKS toward the end of this month. Reports are that the printouts are very sharp and the program is easy to use with more features than similar programs for the 16 bit computers. It can also use FontPOWER fonts and CLIPPER clip art. The package will retail for \$29.95.

□□□ Did you know that you can renew your N&B subscription through OrphanWare? Just call their BBS and leave SYSOP Feedback along with your name, N&B ID, and your VISA or MASTER CARD number and expiration date. The cost is only \$24.75.

□□□ One Minute Formatter is our most widely used PD contribution to the ADAM community. A couple of months ago we updated to IMF 2.0. We are now offering this improved version to the general public. It supports 160K, 320K, and 720K drives. You can select the device number (in case you have three or four drives hooked up) -- and, of course, it formats, verifies, and INITs one or two drives (simultaneously). With the INIT you can have independent volume names, volume sizes, and directory sizes. You can update by sending your original disk with any product order received before 10-15-88. Also, we will probably LIST it next month and include it on the DISK-PAK disk.

□□□ "MIND OVER ADAM" is a GREAT new game for ADAM by Steve Pitman. See our review in this issue; also note the mention under 'NEW PRODUCTS'.

□□□ ADAMzap has plans to release ZORAN III and CHILD'S PLAY in the next few weeks. Both of these new games will make use of the EVE or OBS speech synthesizer. See their ad next month in N&B.

□□□ We are now operating our new BBS. The hours are 7pm - 8am EST weekdays and all day Sat and Sun. 300/1200 bps. 8-N-1 or 7-E-1. Please give us a call.

□□□ Last month, in our list of major graphics contributors, we forgot to include Ed Costello. Thank you.

□□□ MMSG has just released "Copy Cart+ D2.0". Some of the improvements include: storage to any size disk or tape, formats disks within the program, full directory on target media, and game select menu uses game controller. On a 720K target disk you can store as many as 44 16K carts. We have added this excellent cartridge copy utility to our product list: just \$19.95 on disk (only).

□□□ In the 'NEW PRODUCTS' section note that we've now added CARD SET 3 (just released) from BRYAN'S SOFTWARE.

□□□ M.W. Ruth Company is now marketing a mouse for use with ADAM. Contact them for ordering info on this new peripheral from Thomas Electronics.

3100 West Chapel Avenue
Cherry Hill, NJ 08002

□□□ In the latest issue of NIAD's newsletter there was a very unfavorable review of our SwiftPRINT. Never before have we spoken up against anyone having negative comments about a DEI product, but there are some facts that the reviewer cleverly forgot to mention. (1) Just weeks before the review (if that's what it was?) DEI had protested NIAD selling parallel interfaces that bore a high degree of similarity to OrphanWare's board (both to the layman and electrical engineer alike) and including Fast-PATCH (by OrphanWare) and listing the item as a PIA2 on invoices. (2) There are three GRAPHICS PRINT programs for ADAM: IMAGE 2.0, GraphixPAINTER, and SwiftPRINT. The reviewer "wrote" GraphixPAINTER (hmmm). (3) SwiftPRINT sells for five to ten dollars LESS than his GraphixPAINTER (depending on where you buy either). (4) SwiftPRINT offers MORE THAN three times as many features as GraphixPAINTER. (5) And, the real clincher, the reviewer has been planning (insiders tell us) to release his own hi-res color print program specifically for the Okimate 20 this Fall (hmmm). We don't mind honest appraisals of our software that are not favorable; there have been others that were not favorable. But when a review is so blatantly biased by the author it is time to call FOUL!! If anyone who has purchased SwiftPRINT before September 1 directly from DEI thinks that the program really is a piece of garbage, send it in before the end of this month for a FULL refund from us.

☐☐☐ Ready for a special on N&B back issues? Until the 15TH of October you can get any number of N&B back issues from '1' thru '18' (this is issue number 24) for just \$2.25 each. For you newer subscribers this could be a great way to catch up.

☐☐☐ A few selected reviewers are testing the beta version of GoDOS right now. We'll start shipping as soon as the reports come in. We expect this procedure will filter out any bugs that we overlooked before public distribution. Get ready for it; and let us know what you think about it.

☐☐☐ REEDY SOFTWARE has just released PHRASE PAK CONSTRUCTION SET for making your own PHRASE PAK library disks or tapes. And the price is VERY reasonable.

10085 60TH Street
Alto, MI 49302

☐☐☐ We've added several new PD's to our collections. PaintMATES 10 and 11 are now done along with N&Bpix027. We also have two volumes of VideoTUNE songs (34 files each); for use with VideoTUNES by FutureVISION. Reedy Software has released their SOLO PAK vols 2 & 3 (for use with the popular MageQuest adventure) into the public domain. And, we've added Cabbage Patch Kids Adventure by Coleco.

☐☐☐ M.W. Ruth Company has plans to begin issuing credit cards to qualified applicants this Fall. You'll be able to use this card to make purchases from their extensive line of computer products.

☐☐☐ Note OrphanWare's new advertisement in this issue. Also they have a limited quantity of 320K (or 360K) disk drives available for \$219.95 plus 8.80 S/H. This offer expires 9-30-88.

☐☐☐ Alan Neeley will send a copy of his latest issue of ALU for \$3.00. This newsletter is packed with info -- 41 pages. Send to:

ADAMlink of UTAH
2337 South 600 East
Salt Lake City, UT 84106

☐☐☐ Troy Bolin has updated his PICTURE 1.2 with a program called EXCHANGE. This lets you convert his picture format to GP which can also be used by SwiftPRINT and PowerPAINT for printing. You can get the update from us by sending your sales receipt and \$1.00 with a product order.

☐☐☐ We now carry 3.5" disklabels. These are pin feed, 2 ³/₄" x 1 ¹⁵/₁₆" white labels, Just \$6.50 for 500.

☐☐☐ We've updated SwiftLINK to version 1.2; see our BBS for the improvements made. And remember the price of SwiftLINK goes from \$11.95 on disk to \$19.95 on September 30TH.

☐☐☐ David Carmichael has finished the song and graphics files for G.A.M.E. III. Fourteen entertaining graphic and music files for just \$11.95.

☐☐☐ David White plans to release a spell checker for his excellent SpeedyWrite 2.0 in the next couple of weeks. It can be accessed from WITHIN SpeedyWrite 2.0. It comes with a 10,000 word dictionary, 5000 word thesaurus, and it requires at least a 64K memory expander.

☐☐☐ Don't forget about our DISK PAK service; get one disk every other month with all the N&B programs from that and the previous month. Just \$12.00 US, \$14 Canada, and \$18 foreign.

☐☐☐ Much of our new commercial software for ADAM is being copy protected. When you order a copy protected disk we INCLUDE a backup disk too.

☐☐☐ We have repaired a minor bug in our SwiftDISK that caused problems in the catalog size and with SmartWriter use when only a 64K card was installed. You can get the update FREE by sending in your original (add \$1.00 S/H if not placed with an order).

☐☐☐ E&T SOFTWARE sells EPROMS for the 320K disk drives that greatly speed up format time (from 2 minutes down to 40 seconds). These new chips are included with their 320K disk drives and can also be installed in OrphanWare's drives (but OBS will void your warranty if you use them). The E&T and OBS 720K disks are not compatible because the sectors are arranged differently on the tracks.

☐☐☐ We would like to hear from anyone who knows how to contact the author of the French graphics program "Da Vinci". We need his permission in order to add it to our Public Domain libraries, though it apparently already is PD.

☐☐☐ DIGITAL ADVENTURES is on the verge of releasing the first volume in their adventure trilogy for ADAM, "Temple of the Snow Dragon". We have had the honor of playing the beta version -- incredible!! The graphics design is at the least equal to the expensive, colorful adventures on the 16-bit computers. Game play is very challenging with clues hidden in the graphics (every room is depicted with DETAILED graphics) and in the messages. We are predicting that this will be one of the most popular games written for the ADAM (they will also be releasing versions for other systems). See their advertisement in this issue for a black & white example of the graphic quality -- all done on ADAM with PowerPAINT. The retail price for the first adventure in the trilogy is \$24.95; N&B SDP is \$21.95. But, they have authorized us to provide a special introductory offer for N&B subscribers -- order from DEI before 10-7-88 and get it for only \$16.95 (MANY, MANY hours of challenging fun).

OVER THE PHONE LINES

by David E. Carmichael



Below is a listing of local BBS phone numbers that I have on hand. As you will notice most of these are ADAM based BBS's ran on an ADAM system. This is not all of the BBS'S that support ADAM! It just happens to be the only ones that I personally know of. So if you run, or know of a local BBS that supports ADAM, CP/M, or you feel that one would be of interest to ADAM owners please send a letter to me via DIGITAL EXPRESS/NIBBLES & BITS, so that I can append the list in future article for readers to try out.

NAME OF BBS SYSTEM	PHONE #	HOURS LOCAL TIME	MODEM PARMS	BAUD RATE(S)	SYSTEM SUPPORTS
ADAM Link of Utah (can be reached via PC-PURSUIT)	801-484-51214	7pm - 6am 24 HRS S/S	7-E-1	3,12	ADAM
Northern Link (this BBS is in Canada)	403-246-4086	24 HRS	8-N-1	3	ADAM
OBS BBS (the ORDER line for OrphanWare; has contests for hardware give-aways)	216-882-4720	6pm - 8am	8-N-1	3,12,24	ADAM
SCHERER'N PLACE (INFO-MAT Magazine; can be reached via PC-PURSUIT, Wichita, KS)	316-529-2213	24 HRS	8,N,1	3,12,24	CP/M
TRADING POST	216-791-4022	UNKNOWN	7-E-1	3	ADAM
UP AND ADAM	206-859-2019	UNKNOWN	7-E-1	3	ADAM
ADAM NEXUS (this is the new BBS sponsored by DIGITAL EXPRESS)	304-465-1341	7pm - 8am	8-N-1	3,12	ADAM

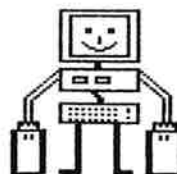
As you will notice I listed a BBS named "SCHERER'N PLACE", and while it does not at this time support ADAM, this system is kind of unique. It is a FOUR LINE PUBLIC BBS where you can have four users plus the sysop online at the same time in a conference just like you would on the national telecommunications systems. "SCHERER'N PLACE" BBS also is one of the many nationwide BBS's that support the national on-line computer magazine called "INFO-MAT". This is one of the few electronically published weekly newspapers dealing with computer news. And while I have only seen one article dealing with the ADAM/COLECOVISION to date, they have covered topics for most other computer systems from the ATARI 2600 to the large mainframes. You may wish to talk one of your local BBS operators into getting setup to distribute "INFO-MAT" in your area by writing to:

INFO-MAT MAGAZINE
8125 S.W. 21st Street
Topeka, KS 66615

As an ADAM user you may even wish to submit an article for publishing! This would help get the word out that the ADAM is still alive and kicking!!

MOVING ADAM

by: Rich Lefko



I've just moved! In fact, my back still aches from unloading the truck. I'm writing this article surrounded by boxes. Sound familiar?

Now I'm not talking about moving around the corner or down the street. I just moved from California to Massachusetts. I'd like to share some of what I've learned about moving, while moving. First, if there was one, and only one, piece of advice I could give it would be this:

SAVE ALL OF YOUR COMPUTER EQUIPMENT BOXES!!!!!!!

That's right. Save your ADAM, disk drive, monitor, printer and modem boxes. Save your roller controller, super action controller and module #1 through #3 boxes, etc. If you don't have room to store all of these boxes, then ask a friend if he/she has room in an attic or basement. Obviously, it's not just the box, but the styrofoam shell inside that's important.

If you are moving down the street or into the next town, you may be moving most everything by car. If this is the case, you should remember: never leave your ADAM, DDP's or disks in a car in the sun for ANY length of time. This is especially hazardous in the summertime, but can be just as detrimental in the winter. While it may not get as hot in the winter, the extremes from hot to cold can cause you all kinds of computer headaches. Also, don't forget to lock your car and toss a blanket over your equipment so that no one else knows what it is.

If you are moving long distance as I did, there are many other things to consider. I moved myself. This means I rented a truck, packed it, and drove it to the new location myself (never again!). Most rental trucks have a fiberglass shell with a thin sheet of aluminum riveted on to that shell. The first thing I did when I got the truck home was to close the rear door and give that shell a good soaking with the garden hose to see if it would leak anywhere. This is probably a good idea even if you aren't moving computer equipment. Feeling confident that my truck would not leak, I went in to pack up ADAM.

After unplugging ADAM from the wall I unplugged every cable that unplugs, labeled where it goes and dropped them in a box cleverly marked "cables". Then I went and got that huge ADAM box out of the garage, opened it up, and began "fitting" things into the styrofoam cutouts. At first it seems impossible to fit all that equipment back into the holes, but after a little trial and error it was done. I thought the safest place for the ADAMLink modem and my memory expansion card was right where they were plugged in, inside the memory console. (They survived with no problems.) By the way, in case you may have forgotten (I did) the styrofoam sides that go around the ADAM printer interlock with that block the keyboard goes in. Don't forget to put that styrofoam block around the ADAM print head. This restrains it from banging around. If you no longer have it, just place something on either side that will prevent the head from moving around. After closing the box, I read the outside for awhile! If you haven't done that in a while, try it! You can actually experience that thrill you got when you first bought it all over again!

If you have disk drives, just close the door before you put them back in their boxes. This keeps the heads from knocking around during transit. If you've got a bad disk laying around, you could put it in and then close the door, but just closing the door worked for me.

I have a Panasonic dot matrix printer and it came with an "L" bracket that will restrain the print head from moving. If you've already tossed this bracket, you will need to restrain the head by using styrofoam or something similar on either side. Be very careful to not upset the cable that connects to the print head!

My monitor went into its box easy enough. If you chucked the box, I suggest bubble wrap all the way around. In either case, make sure it is cool before packing. Most disks come in those plastic cases when you buy them. Don't throw these out either! I keep my master disks in these and they are perfect for moving and storage. My active disks are kept in those desktop storage cases. You can move these as they are; I would suggest packing them in boxes so they don't accidentally get dumped. While packing the truck I thought it unwise to load any computer equipment directly onto the floor or touching the sides or front of the truck. While you don't want to put a lot of weight on top of your computer equipment, I also thought that since the "skin" of the truck is metal, which can conduct electricity (like in a lightning bolt), I used boxes of books as my base and stacked my equipment on top of that.

Finally, if you really want to cover all the bases you might want to consider insuring your equipment: "Safeware", for example, will insure up to \$1000 of computer equipment for only \$25 -- software too. For more information call 1-800-848-3469. If you are moving, good luck. and I hope some of these hints will help you avoid any pitfalls. Oh yeah, don't forget the Ben Gay!

STUDYING OS7

by Leonard F. Adolph



One version of my Basic disassembler reads a selected block from tape or disk to memory so that the block can be looked at as it is on the storage media. This is useful for looking at boots and directories. Upon disassembling the boot for SmartLOGO I found that the first action is a CALL to an OS7 (cartridge operating system) routine. Naturally I then modified my disassembler to look at the OS7 routines.

The following ML routine will bank select the OS7 and dump it to memory starting at 32768 (the upper half of RAM). The routine is put into memory starting at 40960 (8K above the dump location). I run the disassembler with Basic 2.0 and EXTMEM (expander card needed) with LOMEM set above 41002.

```
LD BC,448      1,192,1
CALL 64800    205,32,253 ;disable NMI
LD A,3        62,3
CALL 64788    205,20,253 ;bank select OS7
LD DE,0       17,0,0    ;read start
LD HL,32768   33,0,128  ;write start
LD BC,8192    1,0,32    ;length
LD A,(DE)     26
LD (HL),A     119      ;move one byte
INC DE        19
INC HL        35
DEC C         13
JR NZ,-6     32,249    ;next byte
DEC B         5
JR NZ,-9     32,246    ;next byte if not done
LD A,1       62,1
CALL 64788   205,20,253 ;bank select RAM
LD BC,480    1,224,1
CALL 64800   205,32,253 ;restart NMI
RET          201
```

I am more comfortable with 8080 than Z80; that is why I didn't make use of the block move comands. I got the OS7 jump table labels from the November 1986 issue of the IEAUG newsletter. I have only found two routines that can be safely CALLED without register setups and stack allocation. Routine #10 will display the screen the game option list. Use HGR2 before calling this routine to disable the flashing. Routine #11 will load the ASCII fonts used in cartridge games. The difference in this font from BASIC's is that all lower case become small capitals. The following BASIC program can be used to CALL OS7 routines. WARNING: most routines without further setup will crash ADAM.

```
10 LOMEM :34000
20 DATA 1,192,1,205,32,253,62,3,205,20,253
30 DATA 205,127,31 :REM load game ASCII
40 DATA 62,1,205,20,253,1,224,1,205,32,253,201
50 FOR x=33000 TO 33025:READ mc:POKE x, mc:NEXT
60 CALL 33000
```

The ML routine in the DATA statements is as follows:

```
LD BC,448      1,192,1
CALL 64800    205,32,253 ;disable NMI
LD A,3        62,3
CALL 64788    205,20,253 ;bank select OS7
CALL OS7 add. 205,lo,hi
LD A,1       62,1
CALL 64788   205,20,253 ;bank select RAM
LD BC,480    1,224,1
CALL 64800   205,32,253 ;restart NMI
RET          201
```

ADAM's OS7 Jump Table

<u>OS7 FUNCTION</u>	<u>JUMP TABLE ADR</u>	<u>ABSOLUTE ADR</u>
1: play songs	8033 (97,31)	768 (0,3)
2: activatep (objects?)	8036 (100,31)	1160 (136,4)
3: put objp	8039 (103,31)	1735 (199,6)
4: reflect vertical	8042 (106,31)	7514 (90,29)
5: reflect horizontal	8045 (109,31)	7520 (96,29)
6: rotate 90	8048 (112,31)	7526 (102,29)
7: enlarge	8051 (115,31)	7532 (108,29)
8: controller scan	8054 (118,31)	4426 (74,17)
9: decoder (joystick)	8057 (121,31)	4491 (139,17)
10: game opt. (prints list)	8060 (124,31)	6521 (121,25)
11: load ASCII (OS7 to VRAM)	8063 (127,31)	6439 (39,25)
12: fill VRAM (sect. 1 byte)	8066 (130,31)	6356 (212,24)
13: mode 1	8069 (133,31)	6377 (233,24)
14: update spinner (interrupt)	8072 (136,31)	4458 (106,17)
15: init tablep	8075 (139,31)	6926 (14,27)
16: get VRAMP	8078 (142,31)	7052 (140,27)
17: put VRAMP	8081 (145,31)	7184 (16,28)
18: init spr orderp	8084 (148,31)	7258 (90,28)
19: wr spr nm tblp	8087 (151,31)	7286 (118,28)
20: init timerp	8090 (154,31)	3994 (154,15)
21: free signalp	8093 (157,31)	4024 (184,15)
22: request signalp	8096 (160,31)	4164 (68,16)
23: test signalp	8099 (163,31)	4287 (191,16)
24: write registerp	8102 (166,31)	7356 (188,28)
25: write VRAMP	8105 (169,31)	7405 (237,28)
26: read VRAMP	8108 (172,31)	7466 (42,29)
27: init writerp	8111 (175,31)	1621 (85,6)
28: sound initp	8114 (178,31)	515 (3,2)
29: play itp	8117 (181,31)	593 (81,2)
30: init tablep (9918 regs.)	8120 (184,31)	6941 (29,27)
31: get VRAM (one record)	8123 (187,31)	7075 (163,27)
32: put VRAM (one record)	8126 (190,31)	7207 (39,28)
33: init spr order	8129 (193,31)	7270 (102,28)
34: wr spr nm tbl	8132 (196,31)	7298 (130,28)
35: init timer	8135 (199,31)	4010 (170,15)
36: free signal	8138 (202,31)	4036 (196,15)
37: request signal	8141 (205,31)	4179 (83,16)
38: test signal	8144 (208,31)	4299 (203,16)
39: time manager	8147 (211,31)	3895 (55,15)
40: turn off sound	8150 (214,31)	571 (59,2)
41: write register (9918)	8153 (217,31)	7370 (202,28)
42: read register (9918 stat)	8156 (220,31)	7511 (87,29)
43: write VRAM (from memory)	8159 (223,31)	7425 (1,29)
44: read VRAM (to memory)	8162 (226,31)	7486 (62,29)
45: init writer	8165 (229,31)	1636 (100,6)
46: writer	8168 (232,31)	1657 (121,6)
47: poller (joysticks)	8171 (235,31)	4545 (193,17)
48: sound init	8174 (238,31)	531 (19,2)
49: play it	8177 (241,31)	606 (94,2)
50: sound manager	8180 (244,31)	639 (127,2)
51: activate	8183 (247,31)	1187 (163,4)
52: put object	8186 (250,31)	1752 (216,6)
53: random generator	8189 (253,31)	59 (59,0)

CONTROLLING THE MODEM

by Alan Neeley



ADAMlink's PORTS

The ADAMlink internal modem has two ports that are used. One port sends and receives the data that is being transmitted through the phone lines. This port is known as the DATA port. The second port is called the CONTROL port. This one is used to set the modem in various modes and it controls the way that the data is sent and received through the DATA port.

The CONTROL PORT

The CONTROL port is probably the best place to start the discussion (although it may be the most difficult of the two ports to explain). This port has been assigned a value of 95 (decimal value); whenever you wish to send a COMMAND to or receive STATUS from the control port, you use this value to communicate with the control port.

Notice the words COMMAND and STATUS; what do they mean? Well, let's start with COMMAND. When you send a value to the control port, you are telling (or commanding) the modem to do something. STATUS means that you receive a byte from the control port to determine certain conditions of the modem's DATA port, among other things. The byte is broken down into bits to determine the conditions.

You will notice that I have included some tables that will help you select the correct value to send to the CONTROL port to tell the modem what you want it to do (or, to find out what it is doing). The first table lists the instruction values for all the commands that the ADAMlink modem is able to perform. Some of the values are added before they are actually sent to the CONTROL port. Others are used directly.

The second table is a list of the character mode values. These values set the modem's parameters so that it can correctly send and receive information through the DATA port. To determine the value for the desired setting from the table: Make a selection from column 'A' and one from column 'B' (add the two values together), then add any other values that may be needed (the value of 3 is ALWAYS added to the total for 300 bps). For reasons I'm not sure of yet, the NULL value is added in when using 7-E-1.

TABLE #1: COMMAND INSTRUCTION VALUES

128 = HUNT MODE
 64 = INTERNAL RESET
 32 = ENABLE TRANSMITTER (set RTS to '0')
 16 = RESET ERROR CONDITIONS
 8 = SEND BREAK (TXD goes LOW)
 4 = RECEIVE ENABLE
 2 = SEIZE LINE (set DTR to '0')
 1 = TRANSMIT ENABLE

TABLE #2: CHARACTER MODE VALUES

COL-A (STOP BITS)	COL-B (CHAR LENGTH)
1 bit = 64	5 bits = 0
1.5 bits = 128	6 bits = 4
2 bits = 192	7 bits = 8
	8 bits = 12

OTHER MODES:

enable parity = 16 (NO parity if not set)
 even parity = 32 (if not set, then ODD)

REQUIRED VALUE:

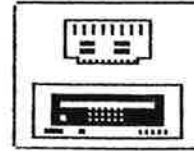
64X clock rate = 3 (required for 300 bps modem)

OPTIONAL VALUE:

NULL = 128 (full purpose unknown)

WHAT TO BUY

by Ron Collins



The best way to decide on what new equipment you should purchase for your ADAM computer system is to first determine just WHAT you will be using the computer for. As with any purchase, the overall usefulness must be compared to the price you will have to pay. I like to get the most for my dollar while still maintaining the highest quality equipment possible. To ensure lasting use, always check out the manufacturer and the warrantee. If you find anything questionable, ask around -- sometimes a good deal and a good value are two separate items!

The most common question I hear concerns whether to buy a disk drive or a memory expansion board. I would say both are a necessity in my line, but to decide which to obtain first is more in line with the question. First, consider what type of programming you will be likely to be involved in. All will benefit from the higher speed data access of a disk drive. On the other hand, much of the new software requires at least a 64K expander before the program can even run! If that isn't bad enough, the disk drive supply is nearly exhausted. What a decision!! The logical choice is the useable item with the best value and longevity. If you don't mind the long load time experienced with digital data pack useage, consider the options of a high speed RAMdisk. The basic 64K memory expander has a variety of uses. I can act as a high speed RAMdisk (an electronic disk drive with NO moving parts!), a print spooler, a copy buffer and a program buffer. The disk drive only speeds up program and data access. If you also consider the new programs such as PowerPAINT, GoDOS, and some of the upcoming titles from Nibbles & Bits that actually expect a memory expander to allow the programs to function, you will see the logic in the memory board purchase.

Software has a way of relying on hardware. QuickKOPY, the best copy utility I know of, uses the memory device as a copy buffer. The program will read a tape or disk, store it into the expander, and then write it onto the destination tape or disk. This sounds like a roundabout copy procedure, but it works fast and it makes it possible to backup important software with a minimum of media swaps. If you've ever copied a data pack with a 16K or less buffer, you know what I mean! If you use ADAMcalc, the memory board acts as a print spooler. This means a completed spreadsheet can begin printing and another can be created at the same time. Without the spooler, the ADAM will freeze until the printer is finished with its task; with the spooler, the data is copied into the expander and the program continues to let you work and the spreadsheet will print OUT OF THE SPOOLER! Programs such as Walter's SmartDISK even allow you to use the large boards such as the OrphanWare MX-256K as a super-sized workspace for SmartWriter.

The next question concerns what size expander to buy. If money is tight, the 64K board will fill most average needs. If you are actively into CP/M, the larger amount of expansion, the better. A 256K card will allow you to copy an entire 160K disk or a full 255K data pack into the copy buffer! You can even copy SmartBASIC files into it and RUN them at HIGH SPEED! It is actually faster to copy your program into the RAMdisk and then run it from that "drive" than to load the large program from tape or even disk. The reason is the lack of media access at load time. The RAMdisk has NO disk to read or tape to wind. A word of warning here about memory chip prices. These chips are used on all sizes of memory expanders and the cost continues to rise. The current cost is upwards of \$16 each. My best advice is to purchase a 256K board with either NO chips or with 64K worth on the board. As your funds build up and the need comes along, you can add extra memory chips to increase the size up to the full 256K. I understand OrphanWare Business Systems is selling the "zero K" option (a 256K board without memory chips) for around \$50. The board even carries an exceptional guarantee.

BASIC LOGICALS

by Guy Cousineau

IF SOME WHARBS ARE THAGLES
AND ALL BRASHONS ARE THAGLES,
THEN SOME WHARBS ARE DEFINITE-
LY BRASHONS. (TRUE OR FALSE)

Logicals are perhaps the most misunderstood and misused programming instructions; even advanced programmers often fail to use them to their advantage. Not only can logicals make programs shorter, but they can also make them execute much faster.

What is a LOGICAL? It is an instruction which uses the result of an operation to make a decision. One of the more common examples of conditional branching is:

```
100 IF x>0 THEN GOTO500
```

When the computer encounters the 'x>0', it checks whether this logical is TRUE or FALSE. If it is true, the LOGICAL TRUE is assigned (usually 1), otherwise the LOGICAL FALSE is assigned to the expression (usually 0). SmartBASIC uses the "1" and "0" to indicate TRUE and FALSE. Thus if 'x>0' is TRUE (a value of 1), the indicated jump is made.

Let's look at a simple example of the NOT logical. Assume a game in which the computer and player alternate moves. You could count the number of moves made and check for odd/even with gymnastics such as:

```
x=x+1: IF INT (x/2)=x/2 THEN GOTO ...
```

A more efficient method would be:

```
x=NOT x: IF x THEN GOTO ...
```

What does 'NOT x' do? Well, if the value of x is non-zero, 'NOT x' will make it zero; if it is already zero, 'NOT x' will make it a one. What about "IF x THEN ..."? This expression will be TRUE whenever 'x' is not '0'. '+.0001', '-.0001', and '8172635445' are all TRUE values for 'IF x'. Look at the following:

```
IF x=2 THEN IF y=3 THEN...  
IF x=2 AND y=3 THEN ...
```

The second one executes much more rapidly and looks much neater. In both cases, THEN is only executed if both x=2 and y=3. Also you should avoid jumping around when THEN instructions can be nested into one program line. Although the following approach does not work in all BASICS, it is fine for SmartBASIC:

```
100 IF x=2 GOTO 110  
105 y=y-1  
106 GOTO 120  
110 y=y+1  
115 z=z/2  
120 more program
```

```
100 IF x=2 THEN y=y+1: z=z/2: GOTO 120  
110 y=y-1  
120 more program
```

Both routines do exactly the same thing, but the second works much faster since there is less jumping around. In line# 100, if x is not equal to '2' the rest of the physical line is skipped and you immediately fall to line# 110. This technique may be a bit trickier to master but can be quite effective. Just look for the condition which requires the least amount of work. In the example above, it might have been better to use the following approach:

```
100 IF x<>2 THEN y=y-1:GOTO 120  
110 y=y+1: z=z/2  
120 more program
```

When dealing with integer values, avoid '>=' and '<=' as much as possible since they take much longer to execute. For example, use "IF x%<6 GOTO..." rather than "IF x%<=5 GOTO..."

THEN AND NOW

1983 → 1988

by Solomon Swift

A few weeks back Bruce Danyi sent in the article below. It originally appeared in *The Complete Buyer's Guide to Personal Computers* (published by Bantam Books) in December 1983. The article was written by Tim Hartnell and Stan Veit.

As you read it, keep in mind that Coleco has now filed for bankruptcy protection and consider all the third party products now available for the orphaned system. We have access to 160K, 320K, 360K, 640K, and 720K disk drives. We can hook up as many as ten disk drives (any size combination), two tapes drives, and use memory expanders as a super fast RAMdrive. And memory expanders are available in 64K increments from 64K to one megabyte. We can hook up industry standard 1200 and 2400 bps modems (in addition to the ADAMlink 300). We can add 80 column boards, industry standard dot matrix printers, and an ADAMnet hard drive is just around the corner. And new, high quality, power-packed software is growing up all around the staggering array of hardware expansion capabilities. Moreover, we have access to tons of PD and commercial CP/M software including WordStar 4.0

ColecoVision ADAM Family Computer System



Coleco, which previously made only video games, has turned the home computer market upside down by introducing a complete home computer system, including a daisy wheel printer, for \$599. The Coleco ADAM Computer also includes a mass data storage unit that uses Digital Data Packs, thin endless-tape cassettes. These run almost as fast as floppy disks but cost much less. They can support a real file system and, in fact, can run CP/M, the standard disk operating system. It is expected that this will provide a huge library of software for the Adam system.

ADAM comes with 80K of RAM memory, and it can be expanded to 144K of RAM. This is much more than any other home computer and will support the user's choice of software.

Coleco is initially releasing the ADAM with the Smart Writer word processor, Smart BASIC (source code compatible with Applesoft BASIC), and a Super Game Pack with a high-resolution graphic version of Buck Rogers and Planet of Doom.

Additional software now in the works includes Smart Filer, an integrated information program, and an Electronic Spreadsheet.

As frosting on the cake, all the ColecoVision Game Cartridges will run on the ADAM, and two game paddles are included with the system.

The ADAM system consists of the computer unit with one tape drive (second drive is optional) and the keyboard, which is

connected to the computer unit by a coiled cord. The keyboard has 75 full-travel keys, a numeric keypad, and the joystick cursor control. One feature of the keyboard is "smart keys," which are redefined for each different software operation.

The printer is an 80-column, letter-quality, bidirectional daisy wheel unit with a 9½-inch carriage and a speed of 120 words per minute. It uses standard carbon ribbon cartridges.

Coleco promised the buyers of its video games that the games could be upgraded to a full computer system. They intend to keep that promise; therefore, ADAM will also be available as an expansion module for the ColecoVision Video Game System.

The ADAM was the most popular exhibit at the 1983 Consumer Electronics Show, and it promises to revolutionize the computer business. It offers a complete computer system and a daisy wheel printer for the price of the lowest-priced daisy wheel printer.

The ADAM system at a glance:

Memory: 80K RAM expandable to 144K

Keyboard: 75 full-travel keys with numeric keypad, game controls with joystick controller

Mass storage: endless wafertape cartridges (Digital Data Packs) that store up to 250 typewritten pages of text

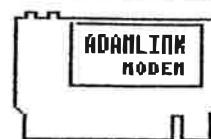
Printer: 80-column, bidirectional daisy wheel; 9½-inch carriage, friction feed; speed: 120 words per minute

Price: \$599 for system includes one drive, BASIC, word processor software, one game pack

For more information: Coleco Corporate Center, 999 Quaker Lane S., West Hartford, CT 06110

CP/M MODEM PROGRAMS

by: Rob Friedman



(continuing from last month ...)

CSEXEC was actually a commercial program from CompuServe that was put into Public Domain by CompuServe after they decided that CP/M was on the downswing. I came across it on CIS, and installed it for the ADAM's serial port with a 1200 baud modem. There are no function keys, but it has a very, very simple script file feature that has to be seen. When I use CSEXEC, and have it use the script file, I hit the command to execute the default file, and when it's done, I've ended up in Computer Club. Nothing else to press. CSEXEC uses CIS-B protocol which works with 512-byte blocks, which is faster than standard Xmodem on CIS. It has no function keys, or a phone library, but you can set up the different phone numbers in individual script files. To download with CSEXEC on CompuServe, all you do after requesting to use CIS-B protocol is to tell it the name for your disk, then CSEXEC does the rest. You don't have to do anything else. This protocol is also known as Vidtex-B. A definite plus when speed is of the essence.

What follows describes my tests of download times using all the external programs at 1200 baud on CompuServe's Computer Club. The system I have is an ADAM module 3 with a ColecoVison (converted to direct video by myself from an old article by John Moore in ECN), 2 DDP's, 2 disk drives, a PIA2 (original!) and a Panasonic KXP1080i, an OrphanWare serial port (version 1) plugged into a used TRS-80 DT-1 terminal for an 80 column display, a second serial board with an Avatex 1200E modem, and a 512K OrphanWare RAMcard (memory expander). As most people on CIS know, I rarely run anything other than CP/M.

PROGRAM DOWNLOADED TO RAMDRIVE: "WP-100.LBR" listed as 37376 blocks online.

<u>PROGRAM</u>	<u>DL SIZE</u>	<u>DL TIME</u>
IMP.COM	292	11:03
MEX-12.COM	292	11:08
CSEXEC.COM	74.5	7:46
KERMIT.COM	564	18:53

Also, here is how CrosSTALK version 3 fares up. This is a very popular commercial program that has its own protocol, as well as Xmodem.

XTALK.COM	292	11:21
-----------	-----	-------

I hope this will give you a good overview of what is out there for us, and a brief comparison, so that you can decide which is right for you.

EDITOR'S NOTE: This concludes Rob's enlightening look at some of the modem programs that we can use on the ADAM. His article was originally downloaded from CompuServe and is reprinted here with his authorization.

PROGRAM EXPLANATIONS

by Solomon Swift



From time to time, nearly every computer user has a need for comparing two media. You might just want to compare two disks to ascertain that one is, in fact, a copy of the other. But, a more common use for comparing two media is to determine differences in them. A hacker might want to find the differences between the disk and tape versions of a game. You might compare two disks with BASIC on them to determine specifically where one has patches that the other doesn't. Once you have access to an easy-to-use compare utility uses for it become more evident.

The program LISTed on the following three pages is my attempt at just such a program. "ezCOMPARE" could have just about as easily been written in Z80. It mostly uses Z80 routines, PEEKs, POKEs, and CALLs. About the only use of BASIC is the PRINT commands.

As is the case with most 'compare' programs, you should have the comparison done on-screen first. Then when you've determined the blocks that are not identical, use the print option. "ezCOMPARE" can send output to the screen, the ADAM printer, or a parallel interfaced DMP. You can choose any two of seven drives to compare; you must use two drives. You can also select the first and last block to compare; the last should be numbered equal to or greater than the first (common sense). This is a direct block to block compare utility; if there is enough interest I'll write one that compares actual files.

Line numbers 200 thru 240 setup the DriveCHECK routine. This is used to determine if there is a medium in a selected drive. The KEY INPUT SOUND is created on line #'s 270 thru 276. This is used when you tap a menu key or press RETURN. Line numbers 280 thru 286 create the routine that sounds a buzz if you press an illegal key. Line #'s 300 thru 304 setup the block read routines for the PRIMARY and OBJECT drives. The object drive is being compared to the primary drive; line #'s 310 thru 326 setup the routine to compare the two blocks.

Here's the basic work principle of the program. Read a block from the primary drive and put it into a 1K buffer in RAM. Read a block from the object drive and put that data into another 1K buffer. Then compare the two buffers byte by byte for any differences. Since the compare algorithm is in Z80, the operation is extremely fast. In fact, it takes longer to print "data replication" on the screen (for identical blocks) than it does to analyze the two 1024 byte buffers.

KeyKLIK

A short while back Dean Roades of the 463 AUG asked if there was a way to add keypress sounds to SpeedyWrite the way that "ezKEYS II" adds them to SmartBASIC. Thus began my work on the program LISTed on pages 18 and 19.

Actually you can use it on any EOS program that doesn't already have keypress sounds. The BASIC program creates a transparent Z80 program for you. The Z80 KeyKLIK program resides entirely within the boot block of medium. Thus you can store other files on it without any problems.

You use the final KeyKLIK program in much the same manner as FastPATCH by OrphanWare; just put it in a drive and pull the computer reset. It will then ask you which drive to boot. Select the drive that you have SpeedyWrite (or BASIC, or JKL Utilities, or BACKUP+, or whatever) in; make sure the medium is in the drive BEFORE you tap the corresponding number key. Now SpeedyWrite will load as usual, but when its all in memory you'll have KeyKLIK sounds while you type. It's just a minor improvement to a great word processor.

PowerPAINT Color

The program on page 20 is yet another patch that lets you customize PowerPAINT. With this one you can set several of the program colors. You will NOT be prompted for new color values. INSTEAD, you should change the variable values on line #'s 150 thru 156 BEFORE RUNNING the program.

The REMark statements explain the meanings of the variables. All but one is a two color value: (foreground * 16) + background. Use the standard TI VDP color table. The values LISTed are the default colors used in PowerPAINT as it is shipped. The 'fa%' variable on line # 155 is the only one that is a single color value. Use this only on a BACKUP copy.

Last month's paintbrush design patch had a minor typo that kept it from working on a data pack. In between the two statements on line # 330 insert: POKE 27601, dv%:. And finish it with the old "GOTO 400". Next month we'll LIST two more foreground brushes designed by David Carmichael in the shape of a hand -- one solid and one outline.

```

10 REM ezCOMPARE
12 REM requires TWO drives
14 REM a freeware donation by DIGITAL EXRPRESS
16 REM presented in Nibbles & Bits September 1988
100 LOMEM :35000: POKE 16149, 255: POKE 16150, 255
110 ON PEEK(259) = 195 GOTO 200
120 TEXT: PRINT " End of program.": END
200 REM status of drive routine
205 DATA 58,251,255,205,126,252,254,1,200,254,155,32,3,62,4,201
210 DATA 58,251,255,205,228,252,245,58,251,255,254,24,32,11
220 DATA 241,203,63,203,63,203,63,203,63,24,3,241,230,15
230 DATA 254,2,200,254,3,200,254,0,200,62,1,201
240 FOR x = 27648 TO 27703: READ mc: POKE x, mc: NEXT
250 REM BASIC setup for z80 driveCHEK routine
255 DATA 205,0,108,50,0,0,201
260 FOR x = 27704 TO 27710: READ mc: POKE x, mc: NEXT
270 REM key input sound
272 DATA 6,15,62,128,211,224,62,17,211,224,62,159,144,211,224
274 DATA 17,0,10,27,122,179,32,251,16,233,62,159,211,224,201
276 FOR x = 27711 TO 27740: READ mc: POKE x, mc: NEXT
280 REM bad key sound
282 DATA 62,226,211,224,62,240,211,224,17,0,100,27,122,179
284 DATA 32,251,62,255,211,224,201
286 FOR x = 27741 TO 27761: READ mc: POKE x, mc: NEXT
290 REM read primary medium
292 DATA 62,0,1,0,0,17,0,0,33,0,116,205,243,252,50,0,0,201
294 FOR x = 27771 TO 27788: READ mc: POKE x, mc: NEXT
300 REM read object medium
302 DATA 62,0,1,0,0,17,0,0,33,0,120,205,243,252,50,0,0,201
304 FOR x = 27791 TO 27808: READ mc: POKE x, mc: NEXT
310 REM compare blocks
320 DATA 33,0,116,17,0,120,1,0,4
322 DATA 26,190,40,10,62,255,50,0,0,237,67,1,0,201
324 DATA 19,35,11,120,177,32,235,175,24,238,201
326 FOR x = 27809 TO 27842: READ mc: POKE x, mc: NEXT
400 DATA tape one,8,tape two,24,disk one,4,disk two,5
405 DATA disk three,6,disk four,7,RAMdrive,26
410 FOR x = 1 TO 7: READ dv$(x), dv%(x): NEXT
420 DATA screen ONLY,ADAM ptr,DMP ptr
425 FOR x = 0 TO 2: READ io$(x): NEXT
430 POKE 65535, 26: POKE 65534, 0
450 io$ = io$(0): FOR x = 1 TO 31: sp$ = sp$+" ": NEXT
460 DATA select primary drive,select object drive,select output device
462 DATA select first block,select last block,COMPARE blocks
464 DATA exit ezCOMPARE
466 FOR x = 1 TO 7: READ m1$(x): NEXT
470 es$ = CHR$(27): re$ = CHR$(13): POKE 65533, 0
480 POKE 65529, 0: POKE 65530, 0: POKE 65532, 159
490 mt$ = "DATA REPLICATION"
500 DIM hx$(15): DATA 0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F
510 FOR x = 0 TO 15: READ hx$(x): NEXT
520 REM PR#2 command
522 DATA 245,219,64,203,71,40,250,241,211,64,201
524 DATA 205,11,47,205,78,4,254,13,192,62,10,24,2,62,0,195,78,4
526 FOR x = 0 TO 28: READ mc: POKE 1102+x, mc: NEXT
528 POKE 16217, 89: POKE 16218, 4

```



ezCOMPARE LIST continued ...

```

1000 POKE 17059, 23: POKE 17115, 23: POKE 17126, 246: TEXT: PR #0
1010 HTAB 11: INVERSE: PRINT "ezCOMPARE": NORMAL: GOSUB 10000
1020 VTAB 12: INVERSE: PRINT sp$: NORMAL: PRINT
1030 FOR x = 1 TO 7: PRINT " "; x; " = "; m1$(x): NEXT
1040 GET k$: k% = VAL(k$)
1045 IF k$ = es$ THEN CALL 27711: GOTO 120
1047 IF k$ = re$ THEN CALL 27711: GOTO 6000
1050 IF k% < 1 OR k% > 7 THEN CALL 27741: GOTO 1040
1060 CALL 27711: ON k% GOTO 1100, 2000, 3000, 4000, 5000, 6000, 120
1100 TEXT: dv% = PEEK(16821): GOSUB 10300
1110 PRINT " primary drive: "; dv$: PRINT: PRINT: GOSUB 10500
1120 POKE 16821, dv%: GOTO 1000
2000 TEXT: dv% = PEEK(65535): GOSUB 10300
2010 PRINT " object drive: "; dv$: PRINT: PRINT: GOSUB 10500
2020 POKE 65535, dv%: GOTO 1000
3000 TEXT: io% = PEEK(65534)
3010 PRINT " current I/O: "; io$(io%): PRINT: PRINT
3020 FOR x = 0 TO 2: PRINT " "; x+1; " = "; io$(x): NEXT
3030 GET k$: k% = VAL(k$)
3040 IF k$ = es$ THEN CALL 27711: GOTO 1000
3050 IF k% < 1 OR k% > 3 THEN CALL 27741: GOTO 3030
3060 k% = k%-1: CALL 27711: POKE 65534, k%: GOTO 1000
4000 TEXT: ad = 65529: GOSUB 10700: fb% = bb%
4010 PRINT " current FIRST block: "; fb%
4020 VTAB 4: INPUT " enter new value: "; fb$: fb% = VAL(fb$)
4030 IF fb% < 0 OR fb% > 719 THEN CALL 27741: GOTO 4020
4040 bb% = fb%: GOSUB 10800: CALL 27711: GOTO 1000
5000 TEXT: ad = 65532: GOSUB 10700: eb% = bb%
5010 PRINT " current LAST block: "; eb%
5020 VTAB 4: INPUT " enter new value: "; eb$: eb% = VAL(eb$)
5030 IF eb% < 0 OR eb% > 719 THEN CALL 27741: GOTO 5020
5040 bb% = eb%: GOSUB 10800: CALL 27711: GOTO 1000
6000 TEXT: IF PEEK(16821) <> PEEK(65535) GOTO 6100
6010 PRINT " Must use different drives!!"
6020 CALL 27741: GOTO 10600
6100 IF fb% <= eb% GOTO 6200
6110 PRINT " FIRST is greater than LAST!!"
6120 CALL 27741: GOTO 10600
6200 TEXT: PRINT " press <RETURN> to begin..."
6205 GET k$: CALL 27711: IF k$ <> re$ GOTO 1000
6210 POKE 27772, PEEK(16821): POKE 27792, PEEK(65535): HOME
6220 FOR xr = fb% TO eb%: hi% = xr/256: lo% = xr-256*hi%
6230 POKE 27777, lo%: POKE 27778, hi%: POKE 27797, lo%: POKE 27798, hi%
6240 CALL 27771: IF PEEK(0) = 128 GOTO 6250
6242 PR #0: PRINT: PRINT " Bad block on primary: "; xr: CALL 27741
6244 GET k$: CALL 27711: GOTO 1000
6250 CALL 27791: IF PEEK(0) = 128 GOTO 6260
6252 PR #0: PRINT: PRINT " Bad block on OBJECT: "; xr: CALL 27741
6254 GOTO 6244
6260 PR #PEEK(65534): POKE 64885, 0
6270 PRINT: PRINT "BLOCK #: "; : vv% = xr: GOSUB 11500
6280 IF PEEK(64885) = 3 OR PEEK(64885) = 27 THEN CALL 27711: GOTO 1000

```



ez COMPARE LIST continued ...

```

6300 ps = 29696: os = 30720: nb = 1024: GOSUB 10900: m1$ = mt$
6310 CALL 27809: IF PEEK(0) = 0 THEN PRINT m1$: GOTO 6400
6320 GOSUB 11000: PRINT " ERROR: BYTE# "; : vv% = b2%: GOSUB 11500
6330 HTAB 5: PRINT "PRIMARY: "; : vv% = PEEK(29696+b2%): GOSUB 11500
6340 HTAB 5: PRINT "OBJECT: "; : vv% = PEEK(30720+b2%): GOSUB 11500
6345 IF PEEK(64885) = 3 OR PEEK(64885) = 27 THEN CALL 27711: GOTO 1000
6350 ps = 29697+b2%: os = 30721+b2%: nb = bc%-1: GOSUB 10900
6360 m1$ = "": ON nb = 0 GOTO 6400: GOTO 6310
6400 IF PEEK(64885) = 3 OR PEEK(64885) = 27 THEN CALL 27711: GOTO 1000
6410 NEXT xr: PR #0: PRINT: PRINT: GOTO 10600
10000 VTAB 3: INVERSE: PRINT "PRIMARY DRIVE:": PRINT "OBJECT DRIVE: "
10010 PRINT: PRINT "OUTPUT OPTION:": PRINT: PRINT "FIRST BLDCK: "
10020 PRINT "LAST BLOCK:   ": NORMAL
10050 dv% = PEEK(16821): GOSUB 10300: d1$ = dv$
10060 dv% = PEEK(65535): GOSUB 10300: d2$ = dv$
10070 io$ = io$(PEEK(65534)): ad = 65529: GOSUB 10700: fb% = bb%
10080 ad = ad+3: GOSUB 10700: eb% = bb%
10100 VTAB 3: HTAB 20: PRINT d1$: HTAB 20: PRINT d2$
10110 PRINT: HTAB 20: PRINT io$: PRINT: HTAB 20: PRINT fb%
10120 HTAB 20: PRINT eb%: RETURN
10300 IF dv% = 8 THEN dv$ = dv$(1)
10302 IF dv% = 24 THEN dv$ = dv$(2)
10304 IF dv% = 4 THEN dv$ = dv$(3)
10306 IF dv% = 5 THEN dv$ = dv$(4)
10308 IF dv% = 6 THEN dv$ = dv$(5)
10310 IF dv% = 7 THEN dv$ = dv$(6)
10312 IF dv% = 26 THEN dv$ = dv$(7)
10314 RETURN
10500 FOR x = 1 TO 7: PRINT " "; x; " = "; dv$(x): NEXT
10510 GET k$: k% = VAL(k$): IF k% = es$ THEN CALL 27711: POP: GOTO 1000
10520 IF k% < 1 OR k% > 7 THEN CALL 27741: GOTO 10510
10530 dv% = dv%(k%): IF dv% = 26 GOTO 10550
10540 POKE 65531, dv%: CALL 27704: IF PEEK(0) <> 0 GOTO 10560
10550 CALL 27711: RETURN
10560 HOME: PRINT " drive empty!!!": CALL 27741: POP
10600 PRINT: PRINT " press any key for menu...": GET k$
10610 CALL 27711: GOTO 1000
10700 bb% = PEEK(ad)+256*PEEK(ad+1): RETURN
10800 POKE ad+1, bb%/256: POKE ad, bb%-256*PEEK(ad+1): RETURN
10900 POKE 27811, ps/256: POKE 27810, ps-256*PEEK(27811)
10910 POKE 27814, os/256: POKE 27813, os-256*PEEK(27814)
10920 POKE 27817, nb/256: POKE 27816, nb-256*PEEK(27817)
10930 RETURN
11000 bc% = PEEK(2)*256+PEEK(1): b2% = 1024-bc%: hv% = 1: RETURN
11500 hi% = vv%/256: lo% = vv%-256*hi%: vv$ = STR$(vv%)
11502 le% = LEN(vv$): ON le% = 3 GOTO 11506
11504 ON le% = 4 GOTO 11508: vv$ = LEFT$(sp$, 3-le%)+vv$
11506 IF hv% = 1 THEN vv$ = " "+vv$
11508 PRINT vv$; " ($";
11510 j1% = hi%/16: j2% = hi%-16*j1%: PRINT hx$(j1%); hx$(j2%);
11520 j1% = lo%/16: j2% = lo%-16*j1%: PRINT hx$(j1%); hx$(j2%);
11530 PRINT ")": hv% = 0: RETURN

```



```

10 REM KeyKLIK
11 REM adds keypress sound to Z80 programs such as
12 REM SpeedyWRITE, BACKUP+, and JKL utilities
13 REM a freeware donation by DIGITAL EXPRESS
14 REM presented in Nibbles & Bits September 1988
15 REM program suggestion by Dean Roades
100 LOMEM :30000: POKE 16149, 255: POKE 16150, 255
110 DATA 62,4,1,0,0,17,0,0,33,0,108,205,246,252,50,0,0,201
120 FOR x = 27601 TO 27618: READ mc: POKE x, mc: NEXT
130 HOME: PRINT " one moment please ..."
140 FOR x = 108*256 TO 112*256-1: POKE x, 0: NEXT
200 POKE 17059, 23: POKE 17115, 23
205 TEXT: PRINT " This program creates a "
210 PRINT " short Z80 program that gives"
220 PRINT " KeyKLIK sound to EOS/Z80"
230 PRINT " programs that don't already"
240 PRINT " have sound, such as, JKL"
250 PRINT " Utilities, SpeedyWRITE, and"
260 PRINT " BackUP+." : PRINT
300 PRINT " Use ONLY on a BLANK disk"
310 PRINT " or data pack!!!": PRINT
320 PRINT " Then boot that new 'KeyKLIK'"
330 PRINT " medium to BOOT the other"
340 PRINT " program.": VTAB 17
400 PRINT " 1 = tape one": PRINT " 2 = disk one"
410 GET k$: k% = VAL(k$)
420 IF k% < 1 OR k% > 2 GOTO 440
430 POKE 27602, 2^(4-k%): GOTO 500
440 HOME: PRINT " end of program.": END
500 TEXT: PRINT " processing data ..."
1000 DATA 49,128,209,120,50,255,255,1,0,0,205,32,253
1010 DATA 1,208,1,205,32,253,33,0,0,62,3,205,41,253
1020 DATA 205,56,253,17,0,4,33,0,0,1,128,0,205,23,253
1030 DATA 33,0,8,62,2,205,41,253,33,0,12,62,4,205,41,253
1060 DATA 62,32,17,0,4,33,0,8,205,38,253,1,244,7,205,32,253
1070 DATA 17,13,8,33,0,202,1,13,0,205,26,253
1080 DATA 17,213,8,33,14,202,1,13,0,205,26,253
1090 DATA 17,37,9,33,28,202,1,13,0,205,26,253
1100 DATA 17,117,9,33,42,202,1,13,0,205,26,253
1110 DATA 17,197,9,33,56,202,1,13,0,205,26,253
1120 DATA 33,0,203,17,50,248,1,125,0,237,176
1130 DATA 62,195,50,218,244,33,75,248,34,219,244
1140 DATA 205,108,252,48,251,254,49,32,24,62,8,50,111,253
1150 DATA 1,0,0,17,0,0,33,0,196,205,243,252,58,111,253,71,0,24,24
1160 DATA 254,50,32,4,62,24,24,226,254,51,32,4,62,4,24,246
1170 DATA 254,52,32,203,62,5,24,246,1,204,7,205,32,253
1180 DATA 17,0,200,1,0,4,33,237,176,34,0,212,33,58,111,34,2,212
1190 DATA 33,253,71,34,4,212,33,195,0,34,6,212
1200 DATA 62,200,50,8,212,33,0,196,195,0,212,-1

```

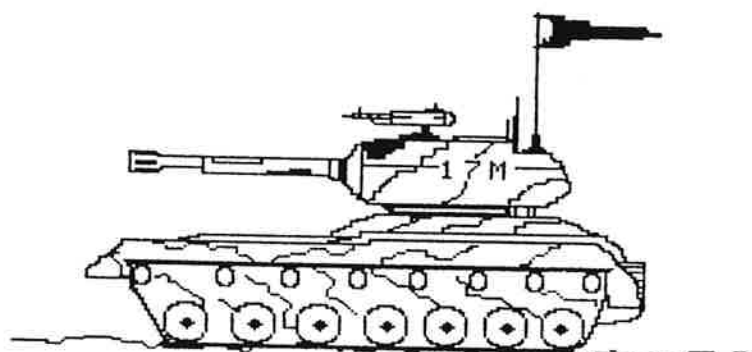


KeyKLIK LIST continued ...

```

2000 st = 100*256: tot = 0
2010 READ mc: IF mc = -1 GOTO 2030
2020 POKE st, mc: st = st+1: tot = tot+mc: GOTO 2010
2030 ON st = 27909 AND tot = 23609 GOTO 3000: GOTO 8400
3000 st = 110*256-1: k$ = "K e y K L I K": GOSUB 4000
3010 k$ = "1=boot tape#1": GOSUB 4000
3020 k$ = "2=boot tape#2": GOSUB 4000
3030 k$ = "3=boot disk#1": GOSUB 4000
3040 k$ = "4=boot disk#2": GOSUB 4000
3050 GOTO 7000
4000 FOR x = 1 TO LEN(k$)
4010 POKE st+x, ASC(MID$(k$, x, 1)): NEXT
4020 st = st+x: RETURN
7000 REM boot drive setup
7010 DATA 58,111,253,1,0,0,17,0,0,33,0,200,205,243,252,194,231,252
7020 DATA 58,111,253,71,195,0,200
8000 REM KeyKLIK sound/keyboard patch
8010 DATA 205,134,251,245,58,117,253,254,160,56,4,241,209,193,201
8020 DATA 254,13,32,7,14,24,17,0,6,24,27,254,32,56,237,14,8
8030 DATA 254,64,56,2,14,12,254,96,56,2,14,16,254,128,56,2,14,20
8040 DATA 17,0,1,6,15,62,128,211,224,121,211,224,62,159,144,211,224,213
8050 DATA 27,122,179,32,251,209,16,235,62,159,211,224
8060 DATA 241,209,193,175,50,117,253,201,-1
8300 st = 111*256: tot = 0
8310 READ mc: IF mc = -1 GOTO 8330
8320 POKE st, mc: tot = tot+mc: st = st+1: GOTO 8310
8330 ON st = 28529 AND tot = 13251 GOTO 8500: GOTO 8400
8400 PRINT: PRINT: PRINT " data entry error!!!"
8410 PRINT " please check your data.": END
8500 TEXT: PRINT " press <RETURN> to store..."
8510 GET k$: IF k$ <> CHR$(13) GOTO 440
8520 HOME: PRINT " writing...": CALL 27601
8530 IF PEEK(0) = 0 GOTO 9000
8540 PRINT " write error on block '0'!!!": END
9000 TEXT: PRINT " 'KeyKLIK' medium created!!!": END

```



```

10 REM a public domain donation by DIGITAL EXPRESS
11 REM presented in Nibbles & Bits September, 1988
12 REM permits some PowerPAINT color customization
13 REM set variables on line #'s 150-156 FIRST
100 LOMEM :29000
110 DATA 62,4,1,0,0,17,40,0,33,0,108,205,243,252,50,255,107,201
120 FOR x = 27601 TO 27618: READ mc: POKE x, mc: NEXT
130 dv$(1) = "TAPE ONE": dv$(2) = "DISK ONE"
150 fc% = 31: REM file folder color (fore * 16 + back)
151 iv% = 23: REM inverse filename color
152 od% = 31: REM odd SmartKEY color
154 ev% = 30: REM even SmartKEY color
155 fa% = 6: REM folder arrow pointer (color range: 1-15)
156 rc% = 244: REM Roman numeral SmartKEY color
200 TEXT: PRINT: PRINT " This program lets you set"
210 PRINT " some PowerPAINT screen colors.";
220 PRINT " Set the variables on line #'s"
230 PRINT " 150 thru 156 FIRST.": VTAB 16
240 PRINT " Use ONLY on a BACKUP!": VTAB 16
300 PRINT " Which drive for PowerPAINT?": PRINT
310 PRINT " 1 = tape one": PRINT " 2 = disk one"
320 GET k$: k% = VAL(k$): IF k% < 1 OR k% > 2 GOTO 350
330 dv% = 2^(4-k%): GOTO 400
350 TEXT: PRINT " end of program.": END
400 HOME: PRINT " insert your PowerPAINT"
410 PRINT " BACKUP into "; dv$(k%); " and"
420 PRINT " press <RETURN> ..."
430 GET go$: IF go$ <> CHR$(13) GOTO 350
500 HOME: PRINT " verifying ..."
510 POKE 27602, dv%: CALL 27601
520 IF PEEK(27647) = 128 GOTO 540
530 PRINT " read error on block 40.": END
540 IF PEEK(28502) = 62 AND PEEK(28506) = 62 GOTO 550
545 PRINT " PowerPAINT not detected.": END
550 HOME: PRINT " patching new colors..."
600 POKE 28503, od%: POKE 28507, ev%: POKE 28542, rc%
610 POKE 27613, 246: CALL 27601
620 IF PEEK(27647) = 0 GOTO 700
630 PRINT " write error on block 40.": END
700 POKE 27607, 41: POKE 27613, 243: CALL 27601
710 IF PEEK(27647) = 128 GOTO 730
720 PRINT " read error on block 41.": END
730 POKE 28336, fc%: POKE 28424, fc%: POKE 28441, fc%
740 f2% = fc%/16: f3% = fc%-16*f2%: POKE 28347, f3%
750 POKE 27613, 246: CALL 27601
760 IF PEEK(27647) = 0 GOTO 800
770 PRINT " write error on block 41.": END
800 POKE 27607, 42: POKE 27613, 243: CALL 27601
810 IF PEEK(27647) = 128 GOTO 830
820 PRINT " read error on block 42.": END
830 POKE 27776, iv%: POKE 27844, fc%
840 POKE 27613, 246: CALL 27601
850 IF PEEK(27647) = 0 GOTO 900
860 PRINT " write error on block 42.": END
900 POKE 27607, 43: POKE 27613, 243: CALL 27601
910 IF PEEK(27647) = 128 GOTO 930
920 PRINT " read error on block 43.": END
930 POKE 28209, fa%*16+f3%
940 POKE 27613, 246: CALL 27601
950 IF PEEK(27647) = 0 GOTO 1000
960 PRINT " write error on block 43.": END
1000 HOME: PRINT " PowerPAINT colors patched!!": END

```



ADVANCED PROGRAMMING

by Solomon Swift



LESSON 4

Lately several of you have asked if it was too late to start sending in the progress reports; you can start ANY TIME. I'd prefer that you begin with Lesson #1, though. If you want to save postage, you can send two in every other month also. If I need to go into more detail on any topic, don't hesitate to let me know.

You may have noticed that I don't cover the previous PR's in following articles. This is because I make comments and answer questions on the PR's themselves (which you get back). This month, I'd like you to let me know on the PR if you're learning new stuff with the articles, or if these are topics that you were already familiar with.

MORE ABOUT THE NUMBERS

The Z80 codes (the numbers) represent the direct instructions to the computer. In truth, the computer only understands binary numbers (sets of one's and zero's; on's and off's). But we tend to express these binary values as their HEXadecimal or decimal equivalents. I have NEVER found a need to work with the binary system directly. However, you will eventually need to understand the concepts involved in the binary system in order to get the best use out of the single BIT operations. (this is a topic of a future article).

The hexadecimal system is based on 16 digits (hex=6, dec=10). The values are: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, and F. "F" has a value of "15" in the decimal system. There four basic reasons for using the HEX system. (1) The numbers bare a closer resemblance to the binary values than the decimal system does. (2) Most assemblers and disassemblers use the HEX system; most file and block editors do too. (3) The numbers format nicely on the computer screen and on paper. (4) It gives a more mysterious air to computer programming. I believe that most commercial programmers are so inculcated with the "necessity" of using the HEX system that they fail to see the utter simplicity of sticking with the number system that we are all familiar with. Naturally, I'm not very fond of the system. I like things simple and easy to understand. Using another number system when the common one works great is, to me, somewhat less than prudent.

But, these articles aren't about my opinions. I just wanted to let those interested know why I don't cover the HEX system very much.

When we (humans) look at the Z80 codes, it's generally easier to think of them as the command they represent rather than some arbitrary abstract number. For example, the "205" (discussed last month) is represented with the mnemonic "CALL". The mnemonic "LD" stands for "LOAD". The mnemonic "CP" means compare. The challenge in the beginning is learning the syntax (parameter structure) for the MANY commands. To beginners and hackers alike I do strongly recommend that you get our EZ REF guides. EZ REF 103 tells you which registers to setup and with what data for the 100+ EOS routines, plus lots of other hacker tidbits. EZ REF 102 provides an ALPHABETIC list of the Z80 codes; this is useful for converting your mnemonics into Z80 code numbers. EZ REF 101 is the NUMERIC list of the Z80 codes; this one is particularly good for breaking Z80 routines and programs back into understandable mnemonics. One unique feature of our guides is that BOTH the hex and the decimal values are given.

HOW DO YOU PUT THEM IN RAM?

Okay, you think of a routine in terms of mnemonics, you convert to Z80 code numbers, but how do you get it into RAM? Many people ask me how this is done (what program do you use?).

I use good old (common) SmartBASIC. Here's how it works. The BASIC interpreter stops at address 27407. Set LOMEM up (to say 28000) to make room to put your Z80 routine. Put your Z80 codes into a DATA statement. Then have another program line read that data and POKE it into RAM in your reserved area. It could go something like this:

```
10 LOMEM: 28000
20 DATA 62,1,50,255,255,201
30 FOR x = 27600 to 27605:
40 READ mc: POKE x, mc: NEXT
50 CALL 27600
```

You CALL the first address (in most cases) to execute your machine code routine from within SmartBASIC. This simple routine puts a "1" into address 65535. It is the equivalent of: POKE 65535, 1. Why use Z80 if you can do it BASIC? Why? Because it is GOOD practice for creating BIGGER routines and even full-fledged Z80 programs.

RELATIVE JUMPS

As is the case with BASIC, your programs really start doing something in Z80 when you have them make decisions and change the direction of program execution based on those decisions. Last month I mentioned that Z80 jumps (JP mnemonic) were analogous to the BASIC GOTO command; and, Z80 calls are similar to BASIC GOSUBS. There is also a specialized form of Jumping.

Relative Jumping (JR mnemonic) lets you move a few bytes backward or forward in RAM. Why use this command set rather than absolute jumps (jumping to an address by its specific location in RAM)? Relative jumps are generally confined to a single routine or algorithm. The advantage of relative over absolute is that the routine can EASILY be moved to another area of RAM. A good routine with relative jumps won't have to be changed at all if relocated in RAM. With absolute jumps, however, you must change every single address reference. There is no equivalent of relative jumping in BASIC; but, it would be like "if x=1 then go back two commands and restart execution".

The number of bytes jumped relative is called the displacement; in mnemonics we refer to this value as "dd" (with an assembler you can jump relative to the address by a given name). The range for a relative jump is 129 bytes forward and 126 bytes backward. Going forward, you start counting at the NEXT byte and continue including the byte that you want to jump to. Going backward, you start at the displacement byte (# of bytes to jump) and continue including the byte that you want to jump to. For backward jumping you subtract the displacement from 256. There are five commands in the relative jump set; these are:

```

#1: JR dd
#2: JR C, dd
#3: JR NC, dd
#4: JR NZ, dd
#5: JR Z, dd

```

The first one is an unconditional relative jump. This means that NO condition has to be met in order to branch execution. The second one means jump relative if, and only if, the Carry flag IS set. The third one will only jump relative if the Carry flag is NOT set (NC). The next one will only jump relative if the Zero flag is NOT set (NZ). The final one executes if, and only if, the Zero flag IS set.

Next month we'll examine these flags and how to use this decision making process. In the meantime, look over the past three lessons, the following progress report is a composite of the first four.

PROGRESS REPORT #4

Be sure to send your answers along with a COPY and an SASE. Don't just answer verbally. Even if the answers seem too simple (or too complicated) write them down and send them in. This reinforces the information for you and it gives me the opportunity to help with any problems.

1. What does a disassembler do?
2. What does an assembler do?
3. What are the FOUR primary register pairs?
4. What's the difference between IMMEDIATE and INDIRECT addressing?
5. Is OPERAND another word for OPCODE?
6. What is the assembly punctuation that indicates an indirect address reference?
7. Explain exactly what the following routine will do on ADAM in 30 column text mode?

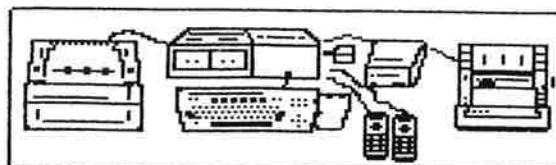
```

LD A, 23
LD L, 0
LD H, 32
LD DE, 16
CALL 64806
RET

```

8. How many digits are in the hexadecimal number system?
9. What two digits constitute the binary number system? What is their significance?
10. What assembly mnemonic represents the compare instruction?
11. To convert mnemonics to Z80 codes would you use an alphabetic or a numeric list of Z80 codes?
12. What are the displacement range limits for relative jumping?

PRODUCT REVIEWS



JK PARALLEL INTERFACE REVIEW

by John R. Lingrel

EDITOR'S NOTE: Recently I received a prototype of a new parallel interface (dot matrix printer board) for the ADAM. The primary distributor for the product, ADAM Development And Modification Services (ADAMS), suggested that I allow BJ of OBS to review it. I found the board to be original and it worked without any problems for me; here is BJ's evaluation.

The note that accompanied the board warned that it is a prototype and that production model quality would be better. The board is well laid out mechanically. It is populated with a 74LS374, a 74LS368, a 74LS32, a DIP switch (for selecting a printer port), a 3.3K resistor pack, a 2N2222 transistor which handles the increased current demands of the strobe signal to the printer, one 51 ohm resistor in the base circuit of the transistor, and two PALS.

I was disappointed to find that it was not supplied with software (though the production model may be). However, it was reported to be PIA2 compatible, so I dug out a copy of our FastPATCH. I installed the interface in the ADAM in the center slot inside the computer. I connected a standard OrphanWare printer cable to the STAR printer per the instructions, turned it all on and booted FastPATCH. I went to the typewriter mode and found that the operation was the same as the PIA2 and the EVE SP-1.

Then I fired up PowerPAINT and printed some graphics, and again the results were satisfactory. It did not miss a character. So with the old STAR (EPSON compatible), we have a winner. I then hooked it up to a Panasonic 1090 and found operation to be flawless. The last 'acid test' was to try it with the new STAR NX1000. It missed characters and had trouble printing graphics. The instructions said that a fix for that was being worked on. I will await the delivery of the fix and report on the performance with a STAR in the future.

The interface also comes with a connection to decode memory addresses for the MX256 which I build. I will, again, warn all 256K users that if the MX256 is connected to anything other than a PIA2 or an A2 addresser from OrphanWare, the warranty is void on the memory board.

Overall, the interface is good, and different from anything that is currently available. I would highly recommend it to the Canadian market, but would not recommend it for sale in the US. I would not sell a board out of the United States that could not be fixed with common everyday components; PALS (while not hard to figure out by electrical engineers) are hard to get that are programmed correctly. The rest is very straightforward, except that the part numbers have been obscured (for security reasons, I presume) which makes the board very difficult to repair (when needed).

I rate it overall a 6 on a scale of '1 to 10'. When the fix is in for the STAR NX1000 printers, I would raise that to a 7 and if the part numbers are put on, it could be an 8. Take off the PALS (at this point in time, I don't believe the market warrants the use of PALS for security, unless they are readily available for repair to the public) and I would re-evaluate the board and possibly change the rating considerably.

PRODUCT:	MicroTalk
MANUFACTURER:	ADAMzap
MEDIA TYPE:	disk/DDP
GRAPHICS/SOUND/DESIGN:	90/93;88
INSTRUCTIONS:	97
USEFULNESS vs. PRICE:	93
RECOMMENDATION:	RECOMMENDED
PRICE:	17.50/15.50
RATED BY:	Luke Whitman

For those of you that have always wanted your ADAM to talk to you, as well as be your best friend that couldn't talk back, ADAMzap has helped to open the gateway for speech. This program has lots of options, good graphics on screen, and the design and format of their program is well oriented for those of us that continue to want more and more out of our ADAM. It requires the EVE SS/CC or the OBS TALKER.

The first speech program needs to be loaded into SmartWriter before you do anything else. From this mode you need to access the DOC file for instructions, and also for a printout of a library of 231 basic words and 12 listed homonyms, as well as a lot of homonyms that are not listed.

Just follow the instructions and you will have no difficulty at all with this one. There is a poem, a speaking calendar/clock, 2 stories, 2 songs (spoken), a warning, and, of course the option of ending the program at any time after the completion of any one of the other options. For a first generation speech program this one is definitely recommended, and well worth the price.

PRODUCT:	MIND OVER ADAM
MANUFACTURER:	Steve Pitman
MEDIA TYPE:	disk/DDP
GRAPHICS/SOUND/DESIGN:	98/96;98
INSTRUCTIONS:	93
USEFULNESS vs. PRICE:	97
RECOMMENDATION:	EDITOR'S CHOICE
PRICE:	11.95
RATED BY:	Solomon Swift

Steve Pitman and I had been exchanging routines and tricks for a while. I knew that this college student majoring programming was talented from our phone conversations and from seeing some of his programs. But when he sent me the first beta version of MIND OVER ADAM to look at, I was simply overwhelmed by the sheer appeal of the game. WOW!! Way to go Steve.

MIND OVER ADAM is based on the same game principle as MasterMIND™. Although I've always liked logic games, this type of game never really appealed to me ... that is until MIND OVER ADAM. There is so much good stuff here that I can't imagine anyone not liking it. Pull the computer reset and a graphic screen appears while the program loads. The instructions are on two screens, tap a key and the second screen instantly appears. With the music, messages, and evil face in the upper lefthand corner of the screen I really felt like I was playing against someone.

The board is on a hi-res screen (designed with PowerPAINT) and uses colorful sprites for the markers. There are six colors to choose from in guessing ADAM's sequence (hidden underneath a bar at the top of the screen). The left and right arrow keys (or joystick) let you select the slot to place the marker. The up/down arrows (or joystick) let you pick the color. After each guess (8 max) you are told how many were the right color in the correct position and how many (exclusively) were the right color. You get a variety of points with emphasis on solving the puzzle in as few guesses as possible. Upon solving one puzzle you move on to the next level with one less guess.

The animation is very impressive. When the game is over you have an opportunity to enter your name in the Hall of Fame (top eight all-time high scores). You do this on a very realistically drawn Ouija board. You select letters in your name by placing the pointer over them on the board. I mention this just as another testament to the creativity and appeal of the program. VERY NICE GAME. I HIGHLY RECOMMEND it to gamers and non-gamers alike. This is one of a new generation of HIGH QUALITY, third party games for us ADAM owners. And, I can guarantee that your purchase will encourage Steve to put out more of these FUN-TO-PLAY (and show off) low cost games.

ORPHANWARE

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PIA2 Centronics Interface

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Expand the ADAM to 144K of memory. This is very useful in ADAMCALC, SMART-WRITER and CP/M. Limited Quantities

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\$62.95 with A2 Addresser

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 BRAVE ARE THOSE WHO ENTER THE TEMPLE. THE JOURNEY IS PERILOUS, NOT FOR THE WEAK OF HEART... DEATH LURKS AROUND EVERY DARKENED CORNER. DEFEAT SUCH FOES AS THE DRAGON KEEPER GANDOR AND THE THIEF OF SOULS, AMONG OTHERS. FIND ALL THE TREASURE AND WEAPONS THAT YOU CAN AS YOU SEARCH FOR THE DRAGON'S EGG. TOO SOON YOU WILL BE FACE TO FACE WITH THE FIERCE SNOW DRAGON. MANY HAVE ENTERED THE TEMPLE... SEVERAL HAVE MADE IT TO THE DRAGON'S ARENA... NONE HAVE RETURNED..... SO... PUT ON YOUR BEST ARMOR, BUCKLE ON YOUR SWORD, GRAB YOUR AXE, INVOKE SEVERAL OF YOUR MOST POWERFUL GOOD LUCK SPELLS, AND HUMBLE SOME OF YOUR FAVORITE PRAYERS... FOR YOUR FATE AWAITS YOU AT THE...

TEMPLE OF THE SNOW DRAGON!

LAS VEGAS CRAPS



Dice Game for the ADAM Computer

Learn to Play Craps
 Try out Your Craps Systems
 or
 Play Just for the Fun

Don't Come	4	5	6	8	9	10	Any 7
BAR	COME						<input type="checkbox"/>
	2·3·4·9 FIELD 10·11·12						<input type="checkbox"/>
Don't Pass	PASS LINE						Any Craps

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Las Vegas Craps
 \$16.95

NEW PRODUCTS



NEW COMMERCIAL SOFTWARE

SpeedyWRITE 1.0: Simply the most advanced word processor ever developed specifically for ADAM -- written in fast Z80 code. More than 100 features including 40 column screen, all screen colors, underline, bold, super & subscript, split screen, line justification, keyboard macros, configuration options and a full supply of file handling utilities, plus lots more. \$29.95 on disk or data pack. (WHITE COMPANY)

SpeedyWRITE 2.0: All of the above plus: INIT support for any disk drive size, ability to edit two files simultaneously, pocket database, already setup for dot matrix or ADAM printer, built-in ramdisk (10K for standard ADAM and 64K with memory expander). Just \$39.95 on disk or data pack.

PICTURE 1.2: great graphics program; move/copy; lines, circles, ellipses, magnify, no printing (but can easily be converted for ShowOFF I or PowerPAINT). Full screen or standard HGR screen drawing. Only \$9.95 on disk or data pack. (TLB SOFTWARE)

PowerPRINTS: 15 full screen pictures for use with PowerPAINT; most designed by professional artists just for ADAM. \$11.95 on disk or data pack. (WIZARD'S LAIR)

CLIP ART (1 & 2): Each volume has more than 40 clip art pictures for use with CLIPPER, PowerPAINT, or GoWRITER. Most are designed by the two commercial artists at WIZARD'S LAIR. \$11.95 each on disk or data pack.

SwiftDISK: Fools the operating system into believing that the super fast ramdisk is a second tape drive. Great for SmartWRITER, ADAMcalc, SmartBASIC, SmartLOGO, and many others. Requires MegaDISK 1.0 and at least a 64K card (works best with 128K or larger card). \$9.95 on disk or data pack. (DIGITAL EXPRESS)

PaintAIDE: Allows you to customize some aspects of PowerPAINT and fixes the minor bugs with the early versions. Let's you preset the SPECIAL typefaces. Plus it comes with over THREE DOZEN font files which really brings out the page design features of PowerPAINT. Includes some BASIC programs too. \$16.95 on disk or data pack. (DIGITAL EXPRESS)

Mr. T-SEARCH: Great word search puzzle maker. Five size options. Nice hardcopy (ADAM or dot matrix). Packed with nice features. \$12.95 on disk or data pack. (Mr. T. SOFTWARE)

PHRASE CRAZE: Colorful graphics; good sound; two or three players; "Wheel of Fortune" type game; very realistic. \$10.95 on disk or data pack. (RBBED SOFTWARE)

GAME (I and II): Each set is two volumes (14 songs with pictures); good entertainment; great for recording as video tape headers. \$11.95 per set on disk or data pack. (DIGITAL EXPRESS)

SwiftPRINT: Powerful graphics file interchange program (RLE, SmartPAINT, GraphixPAINTER, and PaintMASTER). A variety of picture print functions including COLOR for Okimate 20 owners. Requires at least a 64K expander. \$14.95 on disk or DDP (DIGITAL EXPRESS).

SEARCHset (1 & 2): preset word lists for use with Mr. T-SEARCH. \$8.95 each on disk or DDP (DIGITAL EXPRESS)

SmartTALK: multi-featured speech program with graphics and sound. For use with Eve SS/CC or TALKER by OrphanWare. Requires at least a 64K expander. \$19.95 each on disk or DDP. (DIGITAL EXPRESS)

File Indexer: Great utility for organizing directories. Just \$9.95 on disk or DDP. (AJM SOFTWARE)

DISK DOCTOR: Useful program for reconstructing a damaged directory. Just \$9.95 on disk or DDP; (AJM SOFTWARE).

SwiftBASIC 80 (rv 2.3): Now the BASIC that you're used to can be used with the OrphanWare 80 column board. Now it also works with the EVE or OBS clock board. Plus there are many enhancements including DMP support and automatic RAMdrive capability with a memory expander. Just \$11.95 on disk or DDP. (DIGITAL EXPRESS)

CARD SET (1, 2, & 3): Now you can print nice greetings cards with PowerPAINT. Comes with three graphic cards each, plus sprite and clip art. Just \$12.95 on disk or DDP (each). (BRYAN'S SOFTWARE)

SwiftLINK 1.2: A multi-featured terminal program for use with the ADAMlink modem. Written entirely in fast Z80 code. Soon will be setup for 1200bps. Macros, 20 record library (name, #, pw, id, memos, and parms), RAMdrive, plus lots more. Extremely user friendly. Works with 30, 40, or 80 columns (EVE or OBS card required for 80). Imminent updates. Comes with coupon for FOUR free -- send blank disk and 65 cents in postage for updates. We welcome suggestions for improvement. Only \$11.95 on disk or DDP. (DIGITAL EXPRESS)

ASSORTED ITEMS

"Teak wood rolltop disk storage unit" holds 70 5.25" disks just \$17.95
 "Printer power supply" just \$15.95 each
 "RBD or BLUE Panasonic ribbons" just \$5.95 each
 "Black Okimate 10/20 ribbons" just \$4.45 each
 "Color Okimate 20 ribbons" just \$5.45 each
 "Washua Disks" DS/DD; 10 per box; just \$6.45
 "EOS7 DISASSEMBLY" by George Havach just \$2.45 each
 "PICTORIAL GRAPHICS LIBRARY" by DIGITAL EXPRESS; 100+ pages; nicely bound; complete hardcopies of the PD graphics for PowerPAINT; arranged by size (screen, letterhead, workspace, clip art, sprites, fonts, and paint brushes) -- KNOW what's available for PowerPAINT and WHERE to find it; just \$14.95 N&B SDP

RECREATION/GAMES SOFTWARE

- 000 MageQuest (rev 2)** (by REEDY SOFTWARE) \$16.95 (retail) \$14.95 (SDP)
 * superb graphic adventure; includes 9 levels of play in the main adventure plus 3 solo adventures; additional solo adventures available from REEDY SOFTWARE
- 000 TriviaPac I** (by Mr. T. SOFTWARE) \$17.95 (retail) \$14.95 (SDP)
 * 1200 questions; 6 categories; one to four players; graphics and sound; hall of fame; many hours of fun
- 000 Kid's TriviaPac** (by Mr. T. SOFTWARE) \$17.95 (retail) \$14.95 (SDP)
 * 1000 questions; 6 categories; one to four players; graphics and sound; hall of fame; many hours of fun
- 000 Strategy Strain** (by DATA DOCTOR) \$18.95 (retail) \$14.95 (SDP)
 * nine intellectually challenging computer classics; graphics and sound; good Star Trek game
- 000 Lab Mouse** (by REEDY SOFTWARE) \$13.95 (retail) \$11.95 (SDP)
 * exciting game that puts you in the role of a laboratory mouse stuck in a maze; all hi-res graphics; 5 skill levels
- 000 Entertainment Pack** (by REEDY SOFTWARE) \$16.95 (retail) \$14.95 (SDP)
 * three challenging computer classics (connect 4, blockade, and slide puzzle); great graphics; fast animated sprites; one or two players
- 000 Stage Fright** (by REEDY SOFTWARE) \$16.95 (retail) \$14.95 (SDP)
 * extensive text adventure in which you play the role of an actor or actress trapped in an abandoned theater; some graphics and sound; easy to play -- challenging to win; game save option; three progressive levels of play
- 000 Diablo** (by IMAGE MICROCORP) \$19.95 (retail) \$18.95 (SDP)
 * a maze-like game in which the play field consists of user movable tracks on which you try to keep a ball in motion; good graphics; requires substantial strategy to play
- 000 Black Gold** (by IMAGE MICROCORP) \$19.95 (retail) \$18.95 (SDP)
 * a board style game for one to four players; compete by digging for oil; good graphics
- 000 Stock Market Game** (by IMAGE MICROCORP) \$19.95 (retail) \$18.95 (SDP)
 * a board style game for 1 to 4 players; see who makes the biggest profit buying and selling stock; a relatively good tool for learning about the stock market; more enjoyable with some stock market understanding
- 000 Centipede** (by AtariSOFT) \$12.95 (retail) \$11.95 (SDP)
 * the still popular arcade game in which you shoot away segments of oncoming centipedes; available in cartridge ONLY; one or two players
- 000 Defender** (by AtariSOFT) \$12.95 (retail) \$11.95 (SDP)
 * the action packed arcade game in which you shoot attacking alien ships and attempt to save inhabitants of the planet below; available on cartridge PLUS disk or data pack (specify which one you want with the cartridge); one or two players
- 000 Beyond Trek** (by Digital Express) \$19.95 (retail) \$14.95 (SDP)
 * pits you against hostile klingons; very good graphics; good sound/music; protect 4 starbases and annihilate the klingons; you command the Enterprise; hall of fame for 10 high scores (for session or all-time); requires at least a 64K expander
- 000 Chess Champ** (by Digital Express) \$19.95 (retail) \$14.95 (SDP)
 * the FIRST graphic chess game for the ADAM; great graphics; easy user interface; 10 skill levels; a little slow on higher skill levels; good chess playing companion; take back last move; edit board; on-line instructional; store/load up to 52 games per disk or data pack; requires at least a 64K expander
- 000 Las Vegas Craps** (by Al Roginsky) \$16.95 (retail) \$16.45 (SDP)
 * Realistic computer version of the famous casino game; colorful graphics; good sound; good use of sprites; online instructions; stores your money; allows use of markers; and comes with an Official Craps Gaming Guide; this is an EDITOR'S CHOICE GAME--excellent
- 000 MIND OVER ADAM** (by Steve Pitman) \$11.95 (retail) \$11.45 (SDP)
 * This game plays like the popular board game MasterMIND™; great animation; excellent sound; colorful graphics; five levels of play; stores high scores (name entered using a colorful Ouija board (name entered using a colorful Ouija board); this is an EDITOR'S CHOICE GAME--excellent

GUIDES/BOOKS/INSTRUCTIONS

- 000 Hacker's Guide (vol 1) (by Peter & Ben Hinkle) \$12.95 (retail) \$11.95 (SDP)
 * The Hinkle's in - depth guide to the technical aspects of exploring ADAM; 60 pages; 10 programs
- 000 Hacker's Guide (vol 2) (by Peter & Ben Hinkle) \$12.95 (retail) \$11.95 (SDP)
 * The Hinkle's detailed guide to SmartBASIC V1.0; 110 pages; HELLO program includes several BASIC fixes and enhancements
- 000 Hacker Software (by Peter & Ben Hinkle) \$5.95 (retail) \$3.95 (SDP)
 * the programs from volumes one and two (above)
- 000 ez ref 101 (by DIGITAL EXPRESS) \$2.45 (retail) \$1.95 (SDP)
 * approximately 700 Z80 instructions listed in NUMERICAL sequence; 9 pages; decimal, hex, op code, operands; good for disassembling machine code; holes drilled for easy binder insertion
- 000 ez ref 102 (by DIGITAL EXPRESS) \$2.45 (retail) \$1.95 (SDP)
 * approximately 700 Z80 instructions listed in ALPHABETICAL sequence; 9 pages; decimal, hex, op code, operands; good for assembling machine code routines; holes drilled for easy binder insertion
- 000 ez ref 103 (by DIGITAL EXPRESS) \$3.95 (retail) \$2.95 (SDP)
 * study of ADAM's EOS; jump table vectors, routines, setup for CALLs, exit register meanings; plus several assorted tables that have appeared in N&B; 21 pages; holes drilled for easy binder insertion
- 000 Pinball/HardHat Guide \$3.95 (retail) \$2.95 (SDP)
 * 40 pages of instructions for the popular public domain package; holes drilled for easy binder insertion; includes Pinball reference chart

"NIBBLES & BITS" SOFTWARE

- 000 N&B binder01 (by DIGITAL EXPRESS) \$29.95 (retail) \$24.95 (SDP)
 * all six issues from 07/86 thru 12/86; sturdy 3-ring binder; includes two DDPs or two disks containing all the programs
- 000 N&B binder02 (by DIGITAL EXPRESS) \$29.95 (retail) \$24.95 (SDP)
 * all six issues from 01/87 thru 06/87; sturdy 3-ring binder; includes two DDPs or two disks containing all the programs
- 000 N&B issue programs (by DIGITAL EXPRESS) \$6.95 (retail) \$3.95 (SDP)
 *set01: all the programs from 07/86 thru 09/86 *set02: all the programs from 10/86 thru 12/86
 *set03: all the programs from 01/87 thru 03/87 *set04: all the programs from 04/87 thru 06/87
 *set05: all the programs from 07/87 thru 09/87 *set06: all the programs from 10/87, 11/87, & 03/88
 *set07: all the programs from 4/88 thru 6/88 *set08: all the programs from 07/88 thru 09/88

GRAPHICS DESIGN SOFTWARE

- 000 ShowOFF I (by DIGITAL EXPRESS) \$29.95 (retail) \$24.95 (SDP)
 * graphics design package (enter text, draw polygons, paint, save pictures, etc.); fast color changes; a variety of print options (preset for Epson PX / IBM 5152 printer codes); printing graphics requires Centronics parallel interface for printer
- 000 CLIPPER (by DIGITAL EXPRESS) \$19.95 (retail) \$14.95 (SDP)
 * introduces the concept of "clip art" to ADAM; totally machine code program; build clip art collections; put clip art in hi-res pictures; draw and edit clip art; also capture from hi-res pictures; enter text; change colors; includes an 11K ramdisk (does NOT require 64K expander)
- 000 FontPOWER (by DIGITAL EXPRESS) \$16.95 (retail) \$12.95 (SDP)
 * utility using Coleco-like graphics for designing your own font sets; comes with 8 font sets including "script", "Roman", "cory", and "bold"; shows you how to use the font sets in high or low resolution graphics; plus three font shape tables for HGR and HGR2 modes; includes demos; fonts can be used in your own BASIC 1.0, BASIC 2.0, and z80 programs
- 000 SpritePOWER (by DIGITAL EXPRESS) \$19.95 (retail) \$14.95 (SDP)
 * totally machine code utility using Coleco-like graphics for designing your own sprites; includes 3 sets of sprites; extensive instruction manual; shows you how use sprites in BASIC 1.0, BASIC 2.0, and Z80 programs; includes PUPP; includes 11K ramdisk (does not require 64K expander); very easy to use program
- 000 PowerPAINT (by DIGITAL EXPRESS) \$44.95 (retail) \$34.95 (SDP)
 * 80K machine code graphics processor for ADAM; the most extensive graphics design program available; uses Coleco-like graphics; a large variety of file storage and retrieval options (directly loads PaintMASTER, SmartPAINT, GraphixPAINTER, SmartLOGO, and RLE pictures); quick global color changes; move, copy, and erase options; many hardcopy print options (screen, labels, letterheads, and whole picture); screen scroll options; four screen pictures with 64K card (8 screen picture with 256K or 512K expander); uses FontPOWER font sets, CLIPPER clip art, and SpritePOWER sprites; requires at least a 64K memory expander; requires a Centronics parallel interfaced Epson PX or IBM 5152 compatible dot matrix printer for hardcopies; fully compatible with SmartPAINT; you can easily UNDO changes; Internationally acclaimed as THE graphics program for ADAM

PROGRAMMING UTILITY SOFTWARE

- 000 Intel-BEST 3.3** (by DIGITAL EXPRESS) \$24.95 (retail) \$18.95 (SDP)
 * makes over 3 dozen changes to BASIC 1.0; comes with 9 very user friendly MUSIC commands
- 000 Intel-LOAD V1.0** (by DIGITAL EXPRESS) \$15.95 (retail) \$11.95 (SDP)
 * converts BASIC 1.0 programs to load up to 12 times faster; stays in RAM; 2 BSAVE options
- 000 Intel-LOAD V2.0** (by DIGITAL EXPRESS) \$15.95 (retail) \$11.95 (SDP)
 * converts BASIC 2.0 programs to load up to 12 times faster; stays in RAM; 2 BSAVE options; works only in STDMM
- 000 SmartBEST V1.0** (by DATA DOCTOR) \$16.95 (retail) \$14.95 (SDP)
 * makes several changes to BASIC 1.0; not compatible with Intel-BEST 3.3
- 000 SmartTRIX** (by DATA DOCTOR) \$19.95 (retail) \$14.95 (SDP)
 * a set of 10 excellent programming aides; two very nice sprite programs; 60 page manual; disk & DDP versions not compatible
- 000 BASICAide (rev 2)** (by Mr. T. SOFTWARE) \$11.95 (retail) \$9.95 (SDP)
 * several BASIC 1.0 enhancements; new CHAIN command; new BIN command to store fast loading programs; macros; fixes; more
- 000 TurboDISK 1.0** (by DIGITAL EXPRESS) \$24.95 (retail) \$19.95 (SDP)
 * creates ramdisk ability with BASIC 1.0; corrects several BASIC bugs; includes TurboCOPY -- very nice media control and copy utility; requires 64K expander
- 000 MegaUtil** (by MARATHON COMPUTER) \$32.95 (retail) \$27.95 (SDP)
 * an excellent collection of varied programming aids; includes ByteWriter (block editor), CopyWriter (media backup utility), PD modules, programming tips, plus more
- 000 TurboDISK 2.0** (by DIGITAL EXPRESS) \$15.95 (retail) \$11.95 (SDP)
 creates a powerful ramdisk ability for BASIC 2.0 and a 64K expander; disables EXTMM command
- 000 MegaDISK 1.0** (by DIGITAL EXPRESS) \$24.95 (retail) \$19.95 (SDP)
 * creates the ramdisk ability for BASIC 1.0 or your own Z80 programs; works with 64K, 128K, 256K, 512K, and 1M ORPHANWARE memory expanders; automatically checks size of your XRAM card; does NOT disable NMI interrupt (FLASH, etc.); comes with 5 PD programs including EZfileXPBR; much, much faster than a Coleco disk drive; self-booting or can be BRUN after BASIC
- 000 XRAMpak I** (by DIGITAL EXPRESS) \$19.95 (retail) \$14.95 (SDP)
 * the perfect companion for MegaDISK 1.0 and your ORPHANWARE memory expansion board (any size); includes XRboot (boot BASIC 1.0, ADAMcalc, and ADAMlink in about 2 seconds), XRcopy (a VERY powerful copy utility uses ramdisk space ABOVE your files stored there -- great for multiple copies of PD software), PACK and UNPACK (compacts and decompacts your favorite utilities into/from one large file for quick system setup), EZfileXPBR2 (faster than EZfileXPBR, by not restarting the directory after each transfer)
- 000 AUTOWRITER** (by Mr. T. SOFTWARE) \$15.00 (retail) \$14.25 (SDP)
 * a menu driven utility that writes machine code routines and BASIC subroutines (included) of your choice to a user designated data pack or disk; file may then be merged with existing programs to add special features; detailed instruction manual

DOT MATRIX PRINTER SOFTWARE

- 000 FILE PRINTER** (by Terry Fowler) \$9.95 (retail) \$9.45 (SDP)
 * a fine set of BASIC utilities for use with your dot matrix printer; prints SmartWriter compatible files; allows you to set default printer functions; (price goes UP at the end of November)
- 000 ShowOFF II** (by DIGITAL EXPRESS) \$19.95 (retail) \$14.95 (SDP)
 * machine code print enhancements for SmartWriter (adds 32 print controls and 5 CONTROL functions to SmartBASIC; requires Centronics parallel interface, a Panasonic KXP-1080 or 1080i printer, and at least a 64K expander)
- 000 ShowOFF IIa** (by DIGITAL EXPRESS) \$19.95 (retail) \$14.95 (SDP)
 * very similar to ShowOFF II except that it is compatible with any dot matrix printer that supports Epson FX escape codes; works with Epson, Star, and printers and the Okimate 20; does NOT include line justification commands or internal document margin control; requires at least a 64K expander
- 000 Fast & Calc Patch** (by ORPHANWARE) \$9.95 (retail) \$8.95 (SDP)
 * FastPatch 2.0 directs all printer output to your parallel interfaced printer -- can be used with SmartBASIC 1.0, SmartWriter, and SmartFiler; CalcPatch directs ADAMcalc output to your dot matrix printer; neither patch includes special printer commands -- works just like the standard ADAM versions
- 000 LinkPatch** (by ORPHANWARE) \$9.95 (retail) \$8.95 (SDP)
 * ADAMlink II telecommunications software with up and down loading of ASCII files; plus directs printer output to your dot matrix

COLECO COPYRIGHTED SOFTWARE

☐☐☐ SmartLOGO	(data pack only)	\$47.00 (retail)	\$15.95 (SDP)
* Coleco's version of the popular structured language; good for graphics and sound control; 350+ page manual			
☐☐☐ SmartFILER	(data pack only)	\$19.95 (retail)	\$10.95 (SDP)
* Coleco's general purpose database program; easy electronic filing system; search features; 38 page manual			
☐☐☐ ADAMcalc	(data pack only)	\$39.00 (retail)	\$15.95 (SDP)
* advanced electronic spreadsheet; comes with sample templates; 154 page manual			
☐☐☐ CP/M 2.2	(data pack only)	\$49.00 (retail)	\$16.95 (SDP)
* Coleco's version of the still popular operating system; 1000's of public domain supporting programs; 250+ pages			
☐☐☐ SmartLETTERS & FORMS	(disk/data pack)	\$19.95 (retail)	\$9.95 (SDP)
* Includes samples for business, personal, and social letters; \$7.95 on disk			
☐☐☐ Richard Scarry's Word Bk	(data pack only)	\$19.95 (retail)	\$10.95 (SDP)
* Fun to play game; very colorful animated graphics; educational fun for ages 5-8; reading skills builder			
☐☐☐ Recipe Filer	(data pack only)	\$14.95 (retail)	\$6.95 (SDP)
* file recipies by name, type of meal, and main ingredient; ADAM will even print out a grocery list for you			
☐☐☐ Best of Broderbund	(data pack only)	\$14.95 (retail)	\$10.95 (SDP)
* Two fast action games on one tape; futuristic space warrior; the other lets you rescue 64 hostages by chopper			
☐☐☐ Super TAYXON	(data pack only)	\$14.95 (retail)	\$5.95 (SDP)
* Coleco's version of the still popular fast-action arcade game			

COLECO ADAM ADD-ONS

☐☐☐ Exp Mod 2 with Turbo	(cartridge)	\$69.95 (retail)	\$39.95 (SDP)
* tabletop console with arcade-style steering wheel and foot pedal; comes with exciting Turbo cart			
☐☐☐ Super Action Controllers	(cartridge)	\$59.95 (retail)	\$39.95 (SDP)
* two deluxe hand-held game controllers; has built-in spinner and two extra triggers; includes baseball cart			
☐☐☐ Roller Controller	(cartridge)	\$49.95 (retail)	\$29.95 (SDP)
* Arcade-style roller ball; comes with slither cartridge			

COLECO Public Domain Titles

(\$5.95 on tape; \$4.95 on disk)

SmartBASIC 2.0: improved interpreter; 49K file; works with or without 64K card
 Pinball/HardHat Mac: latest version with two demo PB games; 1 to 4 players
 ADAMlink II: supports up and down loading of SW compatible ASCII files; comes with docs
 Jeopardy: just like the game show; great graphics; 1 to 3 players
 Super SubRoc: just like the game show; great graphics; 1 to 3 players
 Troll's Tale: easy graphic adventure; supports one player; disk & DDP not compatible
 Video Hustler: graphic billiards game; 1 or 2 players
 Disk Manager: file handling utility; the program that comes with a Coleco disk drive
 SmartBASIC 1.0: a replacement for the BASIC the came with your ADAM
 Cabbage Patch Kids Adventure: exciting game for kids; maneuver doll around moving and stationary obstacles

MISCELLANEOUS SUPPLIES

□□□ Coleco/LORAN digital data packs	\$29.95 (retail--for 10) \$24.95 (SDP--for 10)	\$3.95 (retail--each) \$2.95 (SDP--each)
* designed and formatted by Loranger Manufacturing; no face label		
□□□ plain label digital data packs	\$19.95 (retail--for 10) \$17.95 (SDP--for 10)	\$3.45 (retail--each) \$2.25 (SDP--each)
* Sony brand formatted by E&T SOFTWARE; no face label		
□□□ plain label 5.25" disks for ADAM	\$6.95 (retail--for 10) \$4.25 (SDP--for 10)	\$.79 (retail--each) \$.49 (SDP--each)
* double-sided; double density; includes envelope and write protect tabs		
□□□ printer ribbons for SmartWRITER printer	\$15.95 (retail--for 3) \$14.95 (SDP--for 3)	\$5.95 (retail--each) \$5.25 (SDP--each)
* black ink; standard replacement ribbon cartridge		
□□□ Panasonic printer ribbon	\$5.45 (retail--each) \$4.95 (SDP--each)	
* black ink; nylon; standard replacement ribbon for 1080, 1080i, 1090, 1091, 1091i, and 1092		
□□□ standard multipurpose adhesive labels	\$5.45 (retail--for 1000) \$3.95 (SDP--for 1000)	\$2.95 (retail--for 500) \$2.25 (SDP--for 500)
* white, pin-feed, 3 1/2" by 1 5/16"; fan fold; single column		
□□□ multipurpose adhesive labels	\$9.95 (retail--for 1000) \$7.95 (SDP--for 1000)	\$6.95 (retail--for 500) \$4.95 (SDP--for 500)
* white, pin-feed, 4" by 1 7/16"; fan fold; single column		
□□□ word processing computer paper	\$4.25 (retail--for 250 sheets) \$3.45 (SDP--for 250 sheets)	
* white; pin-feed; 9 1/2" by 11"; fan-fold; 20 lb. wt.; clean edge; one part		

EDUCATIONAL SOFTWARE

□□□ Spanish Vocabulary (by MARATHON COMPUTER)	\$18.95 (retail)	\$16.95 (SDP)
* a unique program for ADAM; includes electronic dictionary; comes with 1600 words; expandable to 7400 words; quizzes; printed study sheets; report cards		
□□□ QuikPax Quest (by DATA DOCTOR)	\$18.95 (retail)	\$7.95 (SDP)
* three academic quizzes; includes study mode (on - screen and hardcopy); US capitals, world capitals, and Chemistry elements		

HOME/BUSINESS SOFTWARE

□□□ SoftPACK I (by E&T SOFTWARE)	\$18.95 (retail)	\$18.45 (SDP)
* four menu driven home management programs; SoftCHECK, Checkbook Totalizer, CheckBook Reconciler, and SoftMailer (address filer for labels and envelopes)		
□□□ Business Pack I (by E&T SOFTWARE)	\$18.95 (retail)	\$18.45 (SDP)
* two useful programs for creating and printing address files; plus two very good programs for inventory control and printing		



□□□□ "SDP" stands for Subscriber Discount Price. N&B subscribers get a 5% to 25% discount off the suggested retail price of items listed.

□□□□ Unless otherwise noted, all software is available on disk or datapack.

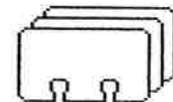
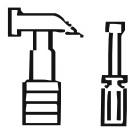
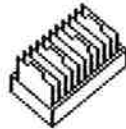
□□□□ All DIGITAL EXPRESS storage media (disks and data packs) are warrantied to be free from defects in materials and workmanship. If the storage medium proves defective, return it to us for replacement or repair (at our descretion). After 90 days from purchase, a \$3.00 return shipping fee is required.

□□□□ The product prices listed herein may be subject to change after October 15, 1988.



CLIP ART

from: PaintMATES97



Public Domain Software Info

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SmartBASIC V1.0 LIBRARY

Each of these volumes is self-booting with SmartBASIC stored on the volume. When you pull the reset, a graphic screen will be displayed as BASIC loads. All programs will speed load. Each volume (except the utility volumes) is controlled by a user friendly RAMdisk (does NOT require the 64K expander) central menu for easy file selection. Each volume contains over 120K of files.

N&Bgames (volumes 1, 2, & 3): an assortment of text adventures, board games, and animation games.
 N&Bgraph (volumes 1 & 2): a variety of graphics displays and music programs.
 N&Bmath (volumes 1 & 2): several scientific and financial math programs.
 N&Butil (volumes 1 & 2): an assortment of programming utilities.

GRAPHICS FILES LIBRARY

In order to view/use the hi-res picture files in this library you need SmartPAINT (from ShowOFF I), the HGR Picture Manager program (02/87 N&B, page 16), or PowerPAINT.

N&Bpix (volumes 001 thru 027): 13 screen pictures each.
 Art Gallery (volumes 1 & 2, compiled by REEDY SOFTWARE): 13 screen pix each.
 PaintMATES (vol 1-11): small art for use with PowerPAINT (fonts, sprites, clip art, & brushes).
 PaintFORMS (vol 1 - 3): one full page graphic, 3 letterheads, & 1 label for use with PowerPAINT.
 PixManII: switch pictures between RLE, SmartPAINT and PaintMASTER formats; includes SW docs.
 PowerVERSES (vol 1 - 3): BIBLE verses stored as hi-res screens by D.L. DECKER ENTERPRISES.

CP/M 2.2 LIBRARY

CP/Mgames (volumes 1 & 2): assorted EBASIC (included) games.
 demo carts: requires 64K XRAM card; music samples, system tester, much more.
 CP/Mutil01: a variety of utility .COM files for CP/M.
 Z80programmer (vols 1 & 2): assorted utilities for advanced programmers; donated by D.L. Decker.

MISCELLANEOUS COLLECTIONS LIBRARY

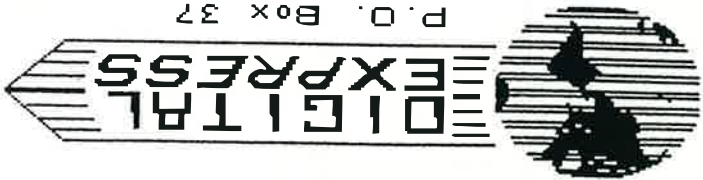
MWplus01: a collection of improvements to MultiWrite (required); by Jim Guenzel.
 N&Bacalc01: several paradigm and other files; 148K; by Terry Fowler.
 EZpak: self-booting medium; contains EZmenu & EZcopy.
 ezFILER: self-booting medium; contains nice BASIC address filer.
 SHAPEMAKER: several font shape tables; nice shape design utility; by Guy Cousineau.
 N&Blogo01: a variety of SmartLOGO (required) files.
 One Minute Formatter: 1 or 2 drives, single or double sided, same time, plus more.
 MusicBOX (vol 1 & 2): 10 SmartTUNES songs each, plus instructions, and more.
 Guy's Games: self-booting collection of graphic, thinking games.
 Guy's Misc. Utils: assorted BASIC utilities by Guy Cousineau.
 Bowling Diary: self-booting database for tracking bowling performance; by Hector Sanchez.
 ADAM FB Analyzer: helps pick winners with NFL score tracking; by Hector Sanchez.
 MediaMATE: Includes media editors by D.L. Ewing, Brett Lynn, and Guy Cousineau.
 French BASIC: includes numerous enhancements and new commands; includes 2 demos.
 VideoTUNE songs (vol 1&2): 34 songs each for use with VideoTUNES by FutureVISION.
 SOLO PACK (vol 2&3): six new adventures each for use with MageQUEST--PD by Reedy Software.

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