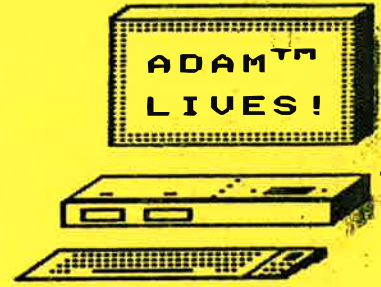




NIBBLES & BITS

the comprehensive monthly
newsletter for ADAM users

P. O. Box 37
Oak Hill, WV 25901



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DESIGNED and PRINTED with the amazing ADAM™ computer (using an Orphanware 64K expander, an Eve Electronics Centronics parallel interface, a Panasonic KX-P1080 dot matrix printer, ShowOFF I, and ShowOFF II).

NIBBLES & BITS

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DIGITAL EXPRESS

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DIGITAL EXPRESS

CREATIVE COMPUTING for the ADAM

EDITOR'S NOTE**N&B NEWS**

Typically summer is the slow season for the computer industry as a whole; but, not for ADAM. We have seen several new software releases and some hardware innovations too. Disk drives and data drives are once again in good supply. It is estimated that there are still well over a hundred thousand active ADAM users -- nearly three years after Coleco announced its decision to drop the computer. The fact is that ADAM had just started to catch on in the marketplace when it was orphaned. Indeed, it is still selling briskly at some department stores (selected as liquidators by Coleco).

Judging from the way that DIGITAL EXPRESS and many other ADAM supporting firms continue to grow, one could safely deduce that the number of active ADAM users is actually on the increase. Those of us who do use ADAM today recognize that it is an excellent value for the price. One advantage that ADAM has over many other orphaned computers is its implementation of CP/M. Over the next few months, you'll note that we're adding many new CP/M volumes to our PD collection. As we expand this library, we'll include articles on the various programs giving you usage hints and program tips. And, starting with this issue we're including a series of articles on CP/M, "Exploring CP/M 2.2", by Guy Cousineau.

Another new department beginning with this issue is entitled "ADAM: Sight & Sound". In this column we'll study the sound and video chips -- graphics is one of the hottest topics for any computer; ADAM is certainly no exception. We'll study video modes, how to set them up, and how to use them. Plus we'll get involved with serious graphics applications. And, we'll discuss programming music and sound effects. Although some of this information is a little complex, we'll try to present it lucidly.

These two new departments are due to reader response. In our "Hacker's Delight" articles we'll continue studying Z80 applications, examining the EOS, and developing BASIC, EOS, and assorted software patches.

In this and the months to come, you'll see a more well rounded exploration of ADAM in N&B. And, you'll see more diverse and more professional software development from DIGITAL EXPRESS and the many other commercial ADAM supporters. One consideration which is frequently employed to determine the worth of a system is the quantity and quality of new products. Applying this truism to ADAM, we can certainly see that our high tech orphan has a healthy future. And, you can rest assured that we, at DIGITAL EXPRESS, will continue our innovations.


Solomon Swift
EDITOR

□□□ DIGITAL EXPRESS has now released twelve commercial software titles for ADAM, the latest being MegaDISK 1.0. The primary program (z80) in this package creates a ramdisk for the new, large Orphanware XRAM boards. The MX-128, MX-256, and MX-512 come with some very impressive CP/M 2.2 patches including access to a larger ramdisk. MegaDISK allows you to access the expansion RAM as a large ramdisk for your own Z80/EOS and SmartBASIC 1.0 programs. See the ADAM ACCESS department of this issue for more details on this exciting package.

□□□ If you hadn't noticed, we've changed the N&B cover color. We'll select a new color each July (our anniversary).

□□□ Our eighth and ninth collections of PD SmartPAINT picture files are now completed. You now have 136 public pictures to choose from. And, there are many more on the way.

Of course, you can view, edit, and print these hi-res graphics with ShowOFF I. Moreover, some of our latest commercial programs give you access to SmartPAINT files, as well. For example, SpritePOWER gives you an option to capture sprites from them. CLIPPER allows you to assemble clip art collections from them. And, our upcoming PowerPAINT will store and retrieve files in this format (and other formats too).

□□□ We have just completed our third "EZ reference guide". EZ ref 103 contains many charts that have appeared in previous issues of N&B. And, it includes a fairly detailed study of the ROM based EOS. The retail price is \$2.45 and the N&B subscriber discount price is just \$1.95.

□□□ Our fifth quarterly collection of N&B issue programs is now complete. N&Bset05 contains all the programs LISTed in the July, AUGust, and September issues. In this issue we have included our program entitled "EZfileXFER". This program copies files from one medium (disk, data pack, or ramdisk) to another. Even the slightest error in typing could cause this program to do severe damage to a medium. We, therefore, recommend that you get it (ready to RUN) on the "N&Bpix05" volume or on "MegaDISK 1.0" (on which it is also included).

ADAM NEWS

□□□ We have added Reedy Software's latest release, **Stage Fright** to our product list. The retail price is \$16.95 and N&B subscribers can get this involved adventure from us for just \$14.95 on DDP or disk.

□□□ We have added **File Printer** by Terry Fowler of gHAU8 to our product list. See our review in this issue of this fine program. The retail price is \$10.45 and the N&B subscriber discount price is just \$9.45.

□□□ We've added 4" by 1 7/16" multi - purpose labels to our product list. These white labels are pin - fed and one across. They're particularly useful in printing graphics screens -- the width of the graphics hi-res graphics screen and about two-thirds down the screen. Our new N&Bpix008 volume contains three such graphic labels by Gerard M. Steen. The retail price for 1000 of the labels is \$8.95; and, the N&B subscriber discount price is only \$6.95.

□□□ We've added a few new volumes to our PD libraries. We have also added **SmartBASIC 1.0** to each of the volumes in that library. This way, you can just insert the disk or DDP and pull the reset to operate the ramdisk (does not require 64K expander) central menu for controlling the programs. The new volumes are N&Bgames03, N&Bgraph02, N&Bmath02, and N&Butil02. Other volumes include N&Bpbgames03, N&Bpbgames04, N&Blogo01 (SmartLDGO programs), and CP/Mutil01.

□□□ These new commercial and PD items will be added to the appropriate lists next month. We are currently reformatting the product lists.

□□□ Finally there is a patch available for Coleco's **ADAMcalc** spreadsheet program that allows you to use a standard parallel interfaced dot matrix printer. The program is being marketed by ORPHANWARE -- see the ADAM ACCESS department of this issue. **CALCPAT** was written by Thomas E. Clary (version 1.0 completed 9/5/87). The BASIC program reads a block from your ADAMcalc backup, changes the print output, and then writes the new data back to your disk or data pack. It is available for \$9.95 (plus S/H) from ORPHANWARE.

□□□ *Family Computing* magazine plans to include an article on ADAM users' groups in their November issue.

□□□ A patch is in the works which will allow **SmartBASIC VI.0** to access the ORPHANWARE 80 column video interface (requires a monitor).

□□□ REEDY SOFTWARE has recently corrected some minor bugs in **MageQuest** (version 2) graphic adventure. They will update your DDP/disk with the return of the original medium and \$2.00 for return shipping (or FREE with any REEDY SOFTWARE purchase). All of our current stock is now updated.

□□□ Syd Carter of TRISYD VIDEO GAMES has updated the software for his **MEGACOPY** data pack formatting unit. This latest version has some color changes, removes the program's copy protection, and is bootable from disk.

□□□ The Panasonic KX-1080i is one of the most popular parallel accessed printers used by ADAM owners. It is Epson & IBM compatible, prints graphics, includes various text options, and has built-in line justification commands. Retailers usually sell this model for 200 to 300 dollars. Occasionally, you'll find one through mail order for \$190 plus shipping. The following two mail order companies are currently offering the KX-1080i for just under \$150 (plus shipping, \$15 - \$20). Even if you don't have a Centronics interface yet (from ORPHANWARE or EVE Electronic s), you might consider getting one of the printers before the dealers' stock is depleted.

FOCUS Computer Center
 1303 46th Street
 Brooklyn, NY 11219
 Toll Free: 1-800-223-3411
 In NY: 718-871-7600

Texas Microland
 6808 Bissonnet
 Houston, TX 77074
 713-668-4695



In a
 strike,
 we all
 close ...

OVER THE PHONE LINES

TIDBITS

by David E. Carmichael

Last month I wrote about how the "ASCII" code allows owners of different brands of computer to have a common language. Another standardized feature that we take for granted is that the phone systems across the world work using the same principles.

Now lets talk about how some of these principles come into play when using your MODEM. Some of these are taken for granted but here again if it were not for some standardization, it would mean that large telecommunication networks such as "PLink" and "CompuServe" would require you to use one brand of MODEM and would only work with one brand of computer. (For instance, Q-LINK can only be used by Commodore 64 owners due to the fact that it requires special software to communicate with their data base.)

Let's start out with what is known as the BELL STANDARDS (for short I will use "BELL S", I would use something else, but...). BELL S - 103 is the most common standard for FULL-DUPLEX (we will get into DUPLEX's later, and no they have nothing to do with a place to live) data transmissions up to 300 baud. It uses a frequency - shift process with 1070 Hz and 1270 HZ for the sending computer and 2025 Hz and 2225 Hz for the receiving computer.

BELL S - 113 is like the BELL S - 103 but works ONLY in HALF-DUPLEX where the computers take turns sending and receiving data. BELL S - 202 is like the BELL S - 113 but works at a rate of 1200 baud and at 1200 Hz and 2200 Hz.

BELL S - 212A is the most common 1200 baud FULL DUPLEX transmission standard with 1200 Hz for the sending computer and 2400 Hz for the receiving computer. And if need be, this will switch back to the BELL S - 103 standard for 300 baud transmission.

There are other standards that have been set up for 2400, 4800 and 9600 baud rates; but, to my knowledge these would not apply to the world of ADAM computing.

The ADAMlink internal modem is known as an INTELLIGENT MODEM due to its built - in microprocessor and memory. This modem is also an AUTO DIAL modem meaning that you enter the number that you wish to call via your computer's keyboard. The ADAMlink modem is also SOFTWARE switchable between HALF and FULL DUPLEX. And, the ADAMlink MODEM is self - SYNCHRONIZING.

This month I have covered some more of the telecommunication standards and how they apply to ADAM. I hope to cover more in the next few months.

SSS Ventilation is important for any computer; overheating can cause permanent damage to internal components. Don't block the vents at the back top of the memory console and the disk drives. If your ADAM printer overheats locking up the system, you might consider a cooling fan. Also, alternate power supplies are available in the event that you want to disconnect the printer all together.

SSS CRC is an abbreviation that you may encounter in an error statement with some programs. CRC stands for Cyclic Redundancy Code. It is a method of verifying data reception.

SSS "Public Domain" software is given to the public at large. It is written for general distribution; you can legally copy it and share it with your friends. "Shareware" (or freeware) is written for limited private distribution. The author of shareware usually includes some provisions for distribution. Sometimes these authors also ask for donations. Copyrighted software is legally restricted to distribution by authorized dealers. It is illegal to give, trade, or sell "copies" of copyrighted software.

SSS With ADAM's EOS there are four common filetypes: "A", "H", "P", and STX (ASCII 2). "A" filetypes are generally standard ASCII (text) files; the BASIC SAVE command stores files in ASCII format. "H" filetypes are binary files with a header; a header is a specified number of bytes at the beginning of the file which describe certain parameters. "P" filetypes are games created by the "Pinball Construction Set". STX filetypes indicate that the file is a z80 binary program and is usually executed by a bootstrap routine in block zero of the medium (disk or data pack). The BASIC CATALOG command will show these with a "frowning face" as the filetype.

SSS Paper weight is expressed in a figure which is the weight of 500 sheets (one ream) of the same paper, size 17" by 22". For example, 20 lb. wt. paper means that a ream of 17" by 22" sheets of that stock weighs 20 pounds. The greater the weight, the thicker the paper. Standard typing paper is usually 9 lb. stock; 20 lb. paper is commonly called "premium weight".

SHOPPING FOR ADAM

by Patricia J. Herrington

Believe it or not, there are some advantages to owning an orphaned computer. For one thing, software costs less. Coleco's software was not expensive to begin with (in comparison to other computers); but when they dumped ADAM, the bottom fell out, and now it's a steal. Also, third party developers have worked overtime to fill the gap left by Coleco; and, they generally sell their work at very reasonable prices. Many of them work more for the love of ADAM than for any great financial gain. We have some good people in our corner!

There are, however, disadvantages; and, the biggest is the problem of *finding* all this neat stuff. That's one of the primary reasons people band together into users' groups.

This month, we're going to concentrate on hardware. Yes, it's out there! First of all, if you want a super bargain, check the local newspaper ads. You must be patient to find an ADAM this way, and you have to get up early and place your call before some other canny shopper beats you to it! But it's worth a shot; my sister-in-law recently got an excellent buy this way. This usually works best if you want a complete system; people who are selling out don't typically do it piecemeal.

Another fantastic way to shop is via CompuServe. There are some very good deals on the Computer Club forum; but, again, this requires patience. You have to keep checking to get what you want.

Local computer stores can help you find items such as monitors that are not designed specifically for the ADAM. And, the *Computer Shopper* magazine, packed with discount ads, can be valuable too. Also, you can read the ads in *Family Computing* and ADAM newsletters.

Now, to get down to specifics: there are some companies that design their own hardware for ADAM. Chief among these are ORPHANWARE and EVE Electronics. Spectrum Electronics, of Canada, has also entered the market.

So what do these folks have for sale? Well, ORPHANWARE is the undisputed leader in memory expanders. They have 64K, 128K, 256K, and 512K RAM expansion cards! I believe their 1200 baud internal modem is the only one on the market; and they have all the more typical items such as printer interfaces. Big John is a serious hardware developer, and he seems to have the attitude that "he can build anything ADAM owners want to pay for". For references, just ask the folks on CompuServe!

EVE Electronics offers some unusual items, too: a speech synthesizer and double-sided Coleco disk drive upgrades. I believe that EVE was the first third party company to design hardware for the ADAM (printer interfaces). They have modems and 64K cards, too; and for CP/M'ers, they have the ever-popular Infocom text games.

Right now, the best buy I know of on new 64K cards is from Spectrum. They go for \$30. I bought mine there, and it performs just fine. They are also designing other items for ADAM.

There are other hardware developers working on ADAM products, but I don't know very much about them. I have tried to contact ADAMland with no success. They used to advertise some unbelievable products; but, since their lightning disaster a year or so ago, I haven't heard anything about them.

In addition to these developers, there are several retailers, some of which have been with us for years, who carry hardware for ADAM. Among the best known are M.W. Ruth and Alpha 1. Both of these companies have interesting (free) catalogs. Many retailers carry modems, 64K cards, cables, interfaces, and peripherals; some carry printers and dust covers. Nearly all have such accessories as ribbons, tapes, and disks at reasonable prices. The larger ones even sell disk drives when available.

Some of the larger users' groups also sell hardware. Among these are NIAD and AUG # 1986. NIAD is one of the oldest and largest of all AUGs; it has a buying service for its members. AUG # 1986 buys everything they can find for ADAM; and they have very good prices. Terry Fowler of gHAAUG has spare data drives for the very attractive price of \$9.95 while they last. All three of these groups publish very informative newsletters.

There are also discount electronics houses that carry parts. Be aware that they are only clearing houses, and will not be of much help after the sale. Also, some of their stock is rebuilt. Most do carry warranties of 30 to 60 days, which is enough time to discover defects in the merchandise. And, their prices are very low.

American Design Components has the lowest price on modems that I've seen recently: \$29. They also have Coleco disk drives for \$199, a bargain price. I ordered one and can tell you that they deliver quickly.

ADAM USERS FORUM

The following questions and comments have been culled from recently received mail. The reader's input is a reasonable facsimile of the actual correspondence. For the benefit of all readers a reply, where applicable, is generally more detailed than any written reply. Unless the reader requests differently, street addresses are omitted.

ASSORTED QUESTIONS

(1) I have CP/M 2.2. How can I type your assembly programs in? (2) Why is it that when I type your long programs in, I get an "Out of Memory" error message? (3) Are you going to publish LOGO, ADAMcalc and BASIC 2.0 programs? (4) How do you use the "merge" command in BASIC 2.0?

Fernando Alvarez
Hackensack, NJ

IN RESPONSE: (1) Our Z80 assembly language lists are intended to augment your understanding of the particular routine. We don't include them for actual entry; that is accomplished via the corresponding BASIC program. There are a couple of Z80 assemblers for CP/M in the public domain; we may add one to our PD list soon. (2) Our BASIC LISTs are actual hardcopies of the working program; we use the SHOWOFF II PR#4 command to LIST them. A memory size error may be the result of an incorrect LOMEM setting. (3) We've LISTed a few BASIC 2.0 programs in previous issues; there are more to come -- we'll start SB 2.0 patches in an upcoming issue. It's rather difficult to LIST ADAMcalc files; ORPHANWARE's new print patch may help here. And, we may start an ADAMcalc tips section if there is enough reader response. We also have LOGO programs in the works. (4) The syntax for the SB 2.0 "MERGE" command is the same as for the "LOAD" command. In fact, MERGE is just a minor variation of LOAD. One point to keep in mind with MERGE is that when identical line numbers are encountered, the last file MERGED takes precedence.

DOT MATRIX PRINTER TIP

In your February 1987 issue (on the bottom of page 21) you LISTed a patch that will allow MultiWrite to be used with a dot matrix printer (most EOS patches won't do this). This program also works with SignShop (by Strategic Software) and with AutoAID (by FutureVision). (paranthal elements added by editor.)

Hector Sanchez
Corpus Christi, TX

TRANSFERRING FILES

Is there a way that I can transfer programs saved to the ramdisk to disk or data pack?

Dave McIntosh
London, Ontario

IN RESPONSE: See the program entitled "EZfileXFER" in this month's HACKER'S DELIGHT department. It will transfer files from one medium (disk, data pack, or ramdisk) to another. You can use it to put your favorite utilities on the fast-access ramdisk. And, it's also useful for transferring files from the ramdisk to a disk or data pack. I like to use the ramdisk for storing partially completed programs. When all the bugs are fixed, I copy the final version to disk.

CHANGING BASICxfer

I have modified the SmartBASIC transfer utility that is LISTed in the November 1986 issue. With the following changes it can be used with only one drive!

DEL 322 - 328

```

425 GOSUB 1000
473 GOSUB 1100
625 GOSUB 1000
635 GOSUB 1100
825 GOSUB 1000
845 GOSUB 1100
863 GOSUB 1000
873 GOSUB 1100
1000 HOME:VTAB 6:?" Insert SRC medium into"
1010 PRINT " drive and press <return>."
1020 GET qu$: IF qu$ = CHR$(13) THEN RETURN
1030 GOTO 1020
1100 HOME:VTAB 6:?" Insert DEST. medium into"
1110 GOTO 1010

```

Darryl Gerbrandt
Victoria, British Columbia

BIT BY BIT**ASCII CODES**

(part 3)

The first 128 ASCII values (0 - 127) are standardized for personal computers. For example, an ASCII "65" represents the upper case letter "A" on ADAM, Apple, Commodore, and Atari. The actual character printed on the screen may be different however. One computer may use a Gothic font set, another might use a bold Roman font set, and so on.

On ADAM the second 128 ASCII values (128 - 256) represent the INVERSE (or alternate) characters in the TEXT mode. Each of these values is 128 greater than its NORMAL counterpart. For example, ASCII 193 (65 + 128) represents an INVERSE "A".

The standard ASCII values are organized as follows:

000 - 029 = CONTROL codes
 030 - 064 = symbols and numbers
 065 - 090 = upper case letters
 091 - 096 = more symbols
 097 - 122 = lower case letters
 123 - 127 = more symbols

On first inspection it may seem peculiar that all the letters are not grouped together. This little mystery can be resolved by examining the bit arrangements for the ASCII bytes. Consider the following:

00000001 = 001 = "A" + <CONTROL>
 01000001 = 065 = "A" + <SHIFT>
 01100001 = 097 = "A" - <SHIFT>

The SHIFTEd "A" is 64 greater than the CONTROL "A". And, the lower case "A" is 32 greater than the SHIFTEd "A". The fifth bit has a value of "32". Setting (making a logical one) this bit or resetting (making a logical zero) the bit provides an easy internal means of regulating the character type. Since there are 26 letters of the alphabet, this leaves room for six ASCII values to represent special symbols between the upper and lower case letter values.

Next month we'll take a look at SmartBASIC's ASCII commands.

**BYTE-SIZED
BASIC****POKES TO PLAY WITH**

(part 15)

UNLOCKING the keyboard:

Have you ever wanted to be able to force the keyboard to UNLOCK from within one of your programs? In certain situations this option would give you better user input control.

On some personal computers it's rather simple to UNLOCK the keyboard from software. You just send a specified value to a particular port. ADAM's setup is different, however.

The keyboard, the SmartWriter printer, each disk drive, and both tape drives have their own microprocessor. Since each of these primary peripherals has its own *computer brain*, they can perform tasks at the same time. The printer could be typing, one disk drive could be reading a disk, the other could be writing to a disk, a tape drive could be reading a DDP, and the keyboard could be accepting user input ... all at the same time.

To maintain control of each one of these devices, the OS (Operating System) needs to continuously check them. This data is stored in 21 - byte buffers referred to as Device Communication Blocks (DCB's). The first byte in each DCB maintains the device's "return code status" (RCS). Address 65220 is the standard location of the keyboard's RCS.

Before you POKE this high in RAM, you may need to reset the POKE limit. To do so:

POKE 16149, 255
 POKE 16150, 255

To UNLOCK the keyboard, you need to POKE a "2" into address 65220. Then, you'll have to restore the previous value. In the immediate mode, you must concatenate the two POKES; if you don't the keyboard will lockup. For example,

pk = PEEK(65220)
 POKE 65220, 2: POKE 65220, pk

This will UNLOCK the keyboard. You could include this routine on the program line just before user input for a little better control. This is essentially the same trick that SmartWriter uses to UNLOCK the keyboard when you press the <BACKSPACE> or left arrow key.

HI-RES SHAPES

(part 3)

The Vectored Bytes:

Last month we discussed how to construct one vectored byte in a shape table. A collection of these vectored bytes constitutes a pattern. The end of each pattern is indicated by an ASCII NUL (or decimal zero).

This terminator causes a minor difficulty, however. A "0" could also indicate three upward movements with the pen lifted. To circumvent this confusion, an "00" is typically employed for each single upward movement with the pen lifted. An "00" represents one upward lift movement, then one lift movement to the left, and concludes with one lift movement to the right. Moving to the left and right accomplishes nothing except to keep the total byte value from being a zero.

The Total Shape Table:

The shape table consists of one or more vectored patterns (or shape definitions) preceded by an index (or table directory). The size of the index is dependent on the number of shapes. The first byte in the index is the number of shapes in the table. The second byte is unused (should be a zero). After this there must be one pair of bytes to represent a displacement pointer to the start of each shape.

The SmartBASIC guide that comes with ADAM uses an example shape table at several points. Let's take a look at this shape table which draws a small box. You may want to refer to page B-9 of the manual.

This shape table consists of 14 bytes. The first four constitute the index. These are as follows:

01 = number of shapes
 00 = unused byte
 04 = displacement (low byte) to first shape
 00 = displacement high byte value

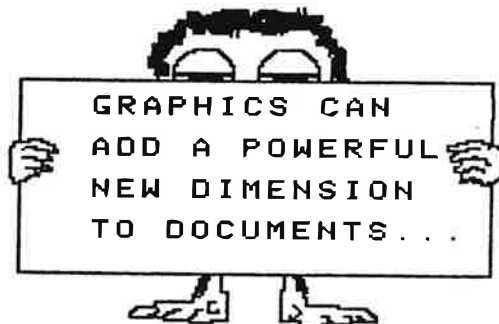
The displacement value is the number of bytes from the beginning of the shape table to the first byte of that shape's pattern. The high byte value is the integer quotient of the displacement divided by 256. The low byte value is the displacement minus the product 256 and the high byte value. Unless the total decimal displacement is greater than 255, the high byte value will be zero. The high byte value is the number of times that the displacement can be divided by 256.

Now, let's look at the pattern bytes. Since there are no movements with the pen lifted, the third section of each byte is unused.

54 = plot/down + plot/down
 63 = plot/left + plot/left
 36 = plot/up + plot/up
 36 = plot/up + plot/up
 45 = plot/right + plot/right
 45 = plot/right + plot/right
 54 = plot/down + plot/down
 54 = plot/down + plot/down
 63 = plot/left + plot/left
 00 = indicates end of pattern

The box starts with a downward line from the center. You can eliminate this by omitting the "54" at the start of the shape definition.

- more next month -



BASIC CONVERSIONS

This is the second in a series of articles designed to assist you in converting programs between SmartBASIC V1.0 (SB 1.0), SmartBASIC V2.0 (SB 2.0), and AppleSoft BASIC (ASoft).

Hi-res Shape Table Pointer:

The pointer to the hi-res graphics shape table is one of the few addresses that is the same for both SB 1.0 and SB 2.0. The first byte is the low order integer of the pointer address and the second byte is the high order integer of pointer address. The shape table pointers must be set before using the DRAW command. Here are the SB and ASoft equivalents:

SB 1.0 (low): 16766
SB 1.0 (high): 16777

ASoft (low): 232
ASoft (high): 233

GR COLOR:

You can change the current COLOR value (using POKE) or ascertain the COLOR of the last PLOTted block (using PEEK) by accessing the COLOR address. This address is different for all three BASICs.

SB 1.0: 16776
SB 2.0: 17111
ASoft: 48

SB 1.0 and SB 2.0 both use the same arbitrary Coleco color code values. It is much easier to work with COLOR, SCRN, HCOLOR, and the assorted screen colors by using the same table: The TI-VDP color code values. The following tricks allow you to correct the COLOR and SCRN functions for the TI-VDP color values.

With SmartBASIC V1.0:
10 FOR x = 0 TO 15
20 POKE 18781+x, x: NEXT X

With SmartBASIC V2.0:
10 FOR x = 0 TO 15
20 POKE 25378+x, x: NEXT x

The following chart shows the TI-VDP color code values:

00 = transparent
01 = black
02 = medium green
03 = light green
04 = dark blue
05 = medium blue
06 = dark red
07 = cyan
08 = medium red
09 = light red
10 = dark yellow
11 = light yellow
12 = dark green
13 = magenta
14 = gray
15 = white

The following table may be of help in converting between the various COLOR values.

TI-VDP	SB 1&2	ASoft
00	xx	xx
01	00;04	00
02	01	xx
03	xx	12
04	09	02
05	06	06;07
06	02	xx
07	14	14
08	05	08
09	11	11
10	08	13
11	13	xx
12	12	04
13	15	01;03
14	10	05;10
15	07;03	15

POKE Limit:

AppleSoft BASIC sets the POKE limit to 65535 by default. For some unknown reason, both versions of SmartBASIC restrict the high end of POKEing. Here's how to correct the limit to address 65535 with each version of SB.

With SB 1.0:
POKE 16149, 255: POKE 16150, 255

With SB 2.0:
POKE 1648, 255: POKE 1649, 255

FLASH Speed:

Each version of BASIC has a different address to control the speed of FLASHing. These are:

SB 1.0: 159
SB 2.0: 153
ASoft: 243



HACKER'S DELIGHT

Z80 DATA PROCESSING

This month we'll take a brief look at the frequently used Z80 AND op code. This logical operation is used to "mask" out specified bits of a byte. Let's see how it works.

AND compares two bytes. One of these is the accumulator and the other is determined by the user specified operand. The result is stored in the accumulator.

The following table describes the four possible bit conditions in using "AND".

```
0 AND 0 yields 0
0 AND 1 yields 0
1 AND 0 yields 0
1 AND 1 yields 1
```

Thus if either corresponding bit in the comparison is a zero, the result is also zero. Consider these two examples.

```
10101010 ANDED with 10000001 yields 10000000
11000011 ANDED with 10000001 yields 10000001
```

This ability to filter or mask out multiple bits can be very convenient. For example, you can mask out the lower nibble of a byte with "AND 11110000" or "AND 240". You can mask out the upper nibble of a byte with "AND 00001111" or "AND 15". You can RESET the parity bit (bit 7) with "AND 01111111" or "AND 127". You can convert a single digit ASCII number to binary with "AND 11001111" or "AND 207".

Next month we'll take a look at how AND affects the FLAG register.

SmartFILER PATCHES

The program LISTed on pages 13 and 14 allows you to easily change the screen color for SmartFILER and it also corrects the extra printed line feed bug. The program permits you to select the color values for the border, the letters, and the background. When you've done this, it will change the values permanently on your BACKUP of the program (never use your original).

The 763rd byte of block 18 determines the number of printed line feeds after a record. It should be a "one" (the default value is "two"). The color control bytes are all located on block 15. The 744th and the 872nd bytes set the border color. The 970th byte sets the letter and background color.

You should only use this program on version "27D" (determined by depressing CONTROL + R from the opening drive selection menu). The program may or may not work with earlier versions.

EOS GAME CONTROLLER INPUT

The game controllers are read through any of the double port pairs starting at number 224. These same ports are used by the sound chip for output. Thus, it is not possible to send a value OUT to a PDL. The values are read in conjunction with the strobe port. When the strobe port is reset (OUT \$C0 or OUT 192), the left trigger, joystick, and spinner can be read. When the strobe port is set (OUT \$80 or OUT 128), the right trigger, keypad, and the two lower super action triggers can be read. The returned keypad values need to be converted from the pin codes to binary values. In addition to all of this, you need to compliment the read value and then mask out certain bits to get the correct input values.

To avoid these complexities, you may utilize the EOS "read game controllers" routine. It is the 91st vector in the EOS jump table. The jump table address is 64830 (62, 253). And, the actual routine is a address 57939 (83, 226).

Before using either CALL option, the accumulator and IX must be setup. The index register should contain a pointer to your 10 byte decoded input buffer. Load the accumulator with one of the following values.

```
1 = read REAR only
2 = read FRONT only
3 = read both controllers
```

There is also an option to read the spinner with this routine, but it doesn't work correctly. In fact, this routine actually resets the spinner's EOS buffer values. We'll discuss this in a later issue and how to correct the bug.

The user input buffer is formatted as follows:

```
byte 0: REAR joystick
byte 1: REAR left trigger
byte 2: REAR right trigger
byte 3: REAR keypad
byte 4: REAR spinner (has bug)
byte 5: FRONT joystick
byte 6: FRONT left trigger
byte 7: FRONT right trigger
byte 8: FRONT keypad
byte 9: FRONT spinner (has bug)
```

After CALLing the EOS routine, you can check the appropriate address in the buffer for a particular input.

Next month we'll continue our study of this routine and correct another minor bug with it (in decoding the keypad inputs). For further study, you might want to examine last month's MoreKeys program and the disassembled routines for it.

EXfileXFER

Pages 15 thru 18 list a program that will copy files from one medium (disk, data pack, or ramdisk) to another. It will copy files of any length. It will copy DELETED files. It automatically LOCKs the copied file. And, it copies the file image, ie, if the original was a binary converted (fast run) BASIC file, the copy will be too. It will copy any type of file (SmartWriter, BASIC, binary, machine code, etc.).

This program is also included in "N&Bset005" and MegaCOPY 1.0. We recommend that you obtain the program from one of these sources, rather than type it in. Even one minor typo could permanently damage the files on a disk or data pack. If you do enter it from this LIST, please check each line very carefully.

The opening menu allows you to select the source and destination (target) media. Select the third option, "copy files", to scan through the directory of the source medium. The directory is displayed as FCB (File Control Block) data at the top of the screen, ie, filename, start block, number of blocks, bytes in last block, etc.

You can scroll through the directory with the UP and DOWN arrow keys. The HOME key restarts the directory. Press ESCAPE to go back to the opening menu. To copy the file which is identified at the top of the screen, press the STORE key. Then, you are prompted to tap the "C" key to begin the copy. Throughout the process, the program checks for various errors. If an error is encountered, the program will apprise you.

If you want to change the source medium, press ESCAPE first to go back to the opening menu. This allows the program to recognize a new medium.

Although the program concept is rather simple, it does reveal some interesting programming tricks. And, the techniques that it uses in checking for errors is rather sophisticated. The machine code in line numbers 200 through 250 comprises a drive check routine that we'll study next month.

The program makes use of five EOS routines. The "read device block" (243,252) and "write device block" (246,252) routines are commonly used; and, we have examined them in previous issues. Let's take a brief look at these other three routines, how to setup for them, and the resulting error codes. The three are generally used within the same program routines.

The "create directory entry" routine is CALLED at address 64713 (201, 252) in the EOS jump table. The accumulator should contain the current drive code. The "HL" pair points to the ASCII of the filename (end the string with ETX). The "DE" ((K-1) * 4) and "BC" (*64) pairs contain the file length. After CALLING the routine, the error code is returned in the accumulator. The following table reveals some of these.

00 = file created OK
 06 = filename already exists
 13 = no more room in directory
 22 = I/O error (missing media or bad block)
 24 = not a standard EOS directory

The "find directory entry" routine is CALLED at address 64716 (204, 252) in the EOS jump table. The accumulator should be Loaded with the current drive code. The "DE" pair points to the ASCII of the filename to search for. The "HL" pair contains a buffer pointer for storing the FCB data (if found). Address 6492B (160, 253) is an area of EOS RAM reserved for such a buffer. The error codes are as follows.

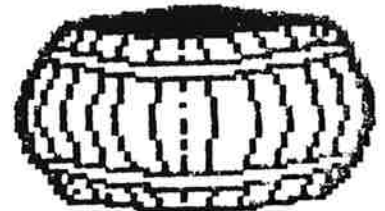
00 = file found
 05 = file not found
 22 = I/O error

The "update directory entry" routine is CALLED at address 64719 (207, 252) in the EOS jump table. The setup and returned error codes are the same as for the "find directory entry". These two will generally be used together. "Find the entry", have the FCB data put into the buffer, alter the FCB data in that buffer, and the "update the directory entry".

```

10 REM *** SmartFILER patches
20 REM fixes extra line feed bug and changes screen colors
30 REM written by DIGITAL EXPRESS
40 REM presented in Nibbles & Bits
50 REM contributed September, 1987
60 REM USE ONLY ON A BACKUP COPY OF SmartFILER!!!
70 REM written for use with "revision 27D"
80 REM may not work with other revisions
100 LOMEM :30000
110 DATA 62,4,1,0,0,17,0,0,33,0,100,205,243,252,50,255,107,201
120 FOR x = 27600 TO 27617: READ mc: POKE x, mc: NEXT
130 DATA 62,4,17,0,100,33,160,253,205,204,252,50,255,107,201
140 FOR x = 27620 TO 27634: READ mc: POKE x, mc: NEXT
150 b1 = 27600: b2 = b1+1: b3 = b1+6: b4 = b1+12
155 f1 = 27620: f2 = f1+1
160 fi$ = "SMART_FILER"+CHR$(3): es$ = CHR$(27): DIM co$(15)
170 FOR x = 1 TO 2: READ dv$(x): NEXT: DATA tape one,disk one
180 DATA black,medium green,light green,dark blue,medium blue
190 DATA dark red,cyan,medium red,light red,dark yellow
200 DATA light yellow,dark green,magenta,gray,white
210 FOR x = 1 TO 15: READ co$(x): NEXT
1000 TEXT: PRINT " This program allows you to"
1010 PRINT " change the screen color for"
1020 PRINT " SmartFILER and it corrects"
1030 PRINT " the extra printed line feed"
1040 PRINT " bug. Press <escape> at any"
1050 PRINT " point to abort ..."
1100 VTAB 15: PRINT " Which drive for SmartFILER?"
1110 FOR x = 1 TO 2: VTAB 16+x: HTAB 2: PRINT x; " = "; dv$(x): NEXT
1120 GET k$: IF k$ = es$ GOTO 1200
1130 k% = VAL(k$): IF k% < 1 OR k% > 2 GOTO 1120
1140 dv% = 2^(4-k%): GOTO 2000
1200 TEXT: PRINT " end of program.": PRINT
1210 PRINT " enter NEW before programming.": END
2000 GOSUB 30000
2010 VTAB 10: INPUT " Border color value: "; br$
2020 br% = VAL(br$): IF br$ = es$ GOTO 1200
2030 IF br% < 1 OR br% > 15 GOTO 2010
3000 GOSUB 30000
3010 VTAB 10: INPUT " Letter color value: "; ft$
3020 ft% = VAL(ft$): IF ft$ = es$ GOTO 1200
3030 IF ft% < 1 OR ft% > 15 GOTO 3010
4000 GOSUB 30000
4010 VTAB 10: INPUT " Background color value: "; bk$
4020 bk% = VAL(bk$): IF bk$ = es$ GOTO 1200
4030 IF bk% < 1 OR bk% > 15 GOTO 4010
4040 IF bk% = ft% GOTO 4010
5000 HOME: HTAB 9: PRINT "drive: ";
5010 IF dv% = 8 THEN PRINT dv$(1): GOTO 5100
5020 PRINT dv$(2)
5100 PRINT " border color: "; co$(br%)
5200 PRINT " letter color: "; co$(ft%)
5300 PRINT " bkgrnd color: "; co$(bk%)
5400 VTAB 10: PRINT " press <return> to change the"
5410 PRINT " values on the medium ..."
5420 GET go$: IF go$ <> CHR$(13) GOTO 1000

```



SmartFILER patches continued ...

```

5500 VTAB 10: PRINT " verifying SmartFILER ...": PRINT
5510 FOR x = 1 TO LEN(fi$): POKE 27647+x, ASC(MID$(fi$, x, 1))
5520 NEXT
5530 POKE 12, dv%: CALL f1
5540 er% = PEEK(27647): VTAB 10: IF er% = 0 GOTO 6000
5550 IF er% = 5 GOTO 5600
5560 PRINT " I/O error!!!": END
5600 PRINT " Not SmartFILER medium!!!": END
6000 PRINT " changing values ..."
6100 REM fix the line feed on hardcopy bug
6110 POKE b2, dv%: POKE b3, 10: POKE b4, 243: CALL b1
6120 IF PEEK(27647) <> 128 THEN VTAB 10: GOTO 5560
6130 POKE 28411, 1: POKE b4, 246: CALL b1
6140 IF PEEK(27647) <> 0 THEN VTAB 10: GOTO 5560
6200 REM change the screen colors
6210 POKE b2, dv%: POKE b3, 15: POKE b4, 243: CALL b1
6220 IF PEEK(27647) <> 128 THEN VTAB 10: GOTO 5560
6230 POKE 28392, br%: POKE 28520, br%: POKE 28618, ft%*16+bk%
6240 POKE b4, 246: CALL b1
6250 IF PEEK(27647) <> 0 THEN VTAB 10: GOTO 5560
6300 VTAB 10: PRINT " SmartFILER patched ...": END
30000 HOME: FOR x = 1 TO 15: x$ = STR$(x)
30010 IF LEN(x$) = 1 THEN x$ = " "+x$
30020 PRINT " "; x$; " = "; co$(x): NEXT: RETURN

```

```

10 REM scroll HGR up
20 REM written by DIGITAL EXPRESS
30 REM September 1987 issue of Nibbles & Bits
100 LOMEM :20000
110 DATA 62,1,245,1,0,1,33,0,216,30,0,87,229,213,197,205,29,253
120 DATA 193,209,225,21,229,213,197,205,26,253,193,209,225,122
130 DATA 190,33,87,229,213,197,205,29,253,193,209,225,21,205,26,253
140 DATA 241,60,254,20,32,204,58,000,000,17,0,1,33,0,19,213,205,38,253
150 DATA 175,209,33,0,51,205,38,253,201
160 FOR x = 27600 TO 27675: READ mc: POKE x, mc: NEXT
200 HGR: FOR x = 0 TO 159 STEP 4
210 HCOLOR = RND(1)*14+2: HPLLOT 0, x TO 255, x: NEXT
300 POKE 0, 17
400 PRINT " <return> = scroll"
410 GET go$: IF go$ <> CHR$(13) GOTO 500
420 CALL 27600: GOTO 410
500 PRINT " end of program.": END

```



```

10 REM EZfileXFER
11 REM simple file copy utility
12 REM by DIGITAL EXPRESS
13 REM a public domain contribution
14 REM September, 1987
20 REM REQUIRES TWO STORAGE DRIVES (disk, tape, or ramdisk)
21 REM copies files of any length
22 REM automatically locks copy
23 REM even copies DELETED files
50 IF PEEK(259) <> 195 GOTO 600
100 LOMEM :38913: POKE 16149, 255: POKE 16150, 255: POKE 16953, 32
105 POKE 61412, 0: POKE 61413, 0
110 DATA select source,select destination,copy files,exit FileXFER
120 FOR x = 1 TO 4: READ m1$(x): NEXT
130 ds% = PEEK(16821): dd% = ds%: FOR x = 1 TO 29: sp$ = sp$+" ": NEXT
140 DATA tape one,tape two,disk one,disk two,ramdisk
150 DATA 0,24,4,5,26
160 FOR x = 1 TO 5: READ dv$(x): NEXT: FOR x = 1 TO 5: READ dv%(x): NEXT
170 DATA 62,0,1,0,0,17,1,0,33,0,212,205,243,252,50,255,107,201
180 FOR x = 27600 TO 27617: READ mc: POKE x, mc: NEXT
190 r1 = 27600: r2 = r1+1: r3 = r1+6: r4 = r1+10
200 DATA 50,251,255,205,126,252,254,1,200,254,155,32,3,62,4,201
210 DATA 50,251,255,205,228,252,245,50,251,255,254,24,32,11
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 DATA 205,0,100,50,255,255,201
260 FOR x = 27704 TO 27710: READ mc: POKE x, mc: NEXT
270 DATA volume name,catalog size,volume size
280 DATA file name,attribute,start,KB allocated,KB used,bytes in last
290 FOR x = 1 TO 3: READ vv$(x): NEXT: FOR x = 1 TO 6: READ ff$(x): NEXT
300 DATA 62,0,33,0,0,17,0,0,1,0,0,205,201,252,50,255,107,201
310 FOR x = 27800 TO 27817: READ mc: POKE x, mc: NEXT
320 k1 = 27800: k2 = k1+1: k3 = k1+3: k4 = k1+4: k5 = k1+7
330 DATA 62,0,17,0,0,33,160,253,205,204,252,50,0,0,201
340 FOR x = 27900 TO 27914: READ mc: POKE x, mc: NEXT
350 f1 = 27900: f2 = f1+1: f3 = f1+3: f4 = f1+4
360 DATA 62,0,17,0,0,33,160,253,205,207,252,50,0,0,201
370 FOR x = 28000 TO 28014: READ mc: POKE x, mc: NEXT
380 u1 = 28000: u2 = u1+1: u3 = u1+3: u4 = u1+4
390 DATA 62,0,1,0,0,17,1,0,33,0,212,205,246,252,50,255,107,201
400 FOR x = 28100 TO 28117: READ mc: POKE x, mc: NEXT
410 w1 = 28100: w2 = w1+1: w3 = w1+6: w4 = w1+10
500 POKE 17059, 27: POKE 17115, 27: POKE 17126, 252: TEXT
510 VTAB 2: HTAB 10: INVERSE: PRINT " EZfileXFER ": NORMAL
520 FOR x = 1 TO 4: VTAB x+4: HTAB 6: PRINT x; " = "; m1$(x): NEXT
530 GET k$: k% = VAL(k$)
540 IF k% < 1 OR k% > 4 THEN PRINT CHR$(7); : GOTO 530
550 ON k% GOTO 1000, 2000, 3000, 600
600 TEXT: PRINT " end of program."
610 PRINT " enter 'NEW' before programming."
620 POKE 16953, 95: POKE 61412, 203: POKE 61413, 86: END
1000 HOME: PRINT " CURRENT SOURCE: ";
1010 dv% = ds%: GOSUB 30100
1020 VTAB 4: GOSUB 30000: IF dv% = 26 THEN POKE 65535, 0: GOTO 1040
1030 POKE 65531, dv%: CALL 27704
1040 ON PEEK(65535) <> 0 GOTO 30200: ds% = dv%: GOTO 500

```

EZfileXFER LIST continued ...

```
2000 HOME: PRINT " CURRENT DESTINATION: ";
2010 dv% = dd%: GOSUB 30100
2020 VTAB 4: GOSUB 30000: IF dv% = 26 THEN POKE 65535, 0: GOTO 2040
2030 POKE 65531, dv%: CALL 27704
2040 ON PEEK(65535) <> 0 GOTO 30200: dd% = dv%: GOTO 500
3000 IF ds% <> dd% GOTO 3050
3010 HOME: PRINT " You MUST use different drives"
3020 PRINT " for the SOURCE and DESTINATION";
3030 PRINT " media!!!": GOTO 30260
3050 POKE 17059, 244: POKE 17115, 244: POKE 17126, 23
3100 TEXT: PRINT " press <return> to read the"
3110 PRINT " directory of "; : dv% = ds%: GOSUB 30100
3120 GET go$: IF go$ <> CHR$(13) THEN GOTO 500
3130 fb% = 1: GOSUB 30300
3140 ON PEEK(27647) <> 128 GOTO 30400: HOME: GOSUB 31000
3200 bs = (fb%*4+108)*256: fc% = 0
3210 st = bs+fc%*26: ON fb% > 1 OR fc% > 0 GOTO 3300
3220 FOR x = 1 TO 3: VTAB x: HTAB 2: PRINT vv$(x); ":": NEXT
3230 vn$ = "": FOR x = st TO st+11: pk = PEEK(x): IF pk = 3 GOTO 3240
3235 vn$ = vn$+CHR$(pk): NEXT
3240 VTAB 1: HTAB 17: PRINT vn$
3250 vs% = PEEK(st+12): IF vs% > 128 THEN vs% = vs%-128
3260 VTAB 2: HTAB 17: PRINT vs%
3270 VTAB 3: HTAB 17: PRINT PEEK(st+17)+256*PEEK(st+18)
3275 PRINT: PRINT: PRINT: PRINT
3280 VTAB 8: PRINT " FCB #:"; : HTAB 17
3290 PRINT (fb%-1)*39+fc%: GOTO 4000
3300 IF fc% > 1 GOTO 3330
3310 FOR x = 1 TO 6: VTAB x: HTAB 2: PRINT ff$(x); ":": NEXT
3330 fi$ = "": FOR x = st TO st+11: pk = PEEK(x): IF pk = 3 GOTO 3350
3340 fi$ = fi$+CHR$(pk): NEXT
3350 VTAB 1: HTAB 17: PRINT fi$
3360 VTAB 2: HTAB 17: PRINT PEEK(st+12)
3370 VTAB 3: HTAB 17: PRINT PEEK(st+13)+256*PEEK(st+14)
3380 VTAB 4: HTAB 17: PRINT PEEK(st+17)+256*PEEK(st+18)
3390 VTAB 5: HTAB 17: PRINT PEEK(st+19)+256*PEEK(st+20)
3400 VTAB 6: HTAB 17: PRINT PEEK(st+21)+256*PEEK(st+22)
3410 VTAB 8: HTAB 17: PRINT (fb%-1)*39+fc%: GOTO 4000
4000 GET go$: IF go$ = CHR$(27) THEN GOTO 500
4010 IF go$ = CHR$(128) THEN fb% = 1: GOTO 3200
4100 IF go$ <> CHR$(160) GOTO 4200
4110 IF fc% = 0 AND fb% = 1 THEN PRINT CHR$(7); : GOTO 4000
4120 IF fc% <> 0 THEN fc% = fc%-1: GOTO 3210
4130 IF fc% = 0 THEN fb% = fb%-1: bs = (fb%*4+108)*256
4140 fc% = 38: GOTO 3210
4200 IF go$ <> CHR$(162) GOTO 4300
4210 IF PEEK(st+12) = 1 THEN PRINT CHR$(7); : GOTO 4000
4220 IF fc% = 38 THEN fb% = fb%+1: GOSUB 32000: GOTO 3200
4230 fc% = fc%+1: GOTO 3210
4300 IF go$ = CHR$(147) OR go$ = CHR$(155) GOTO 5000
4310 PRINT CHR$(7); : GOTO 4000
```


EZfileXFER LIST continued ...

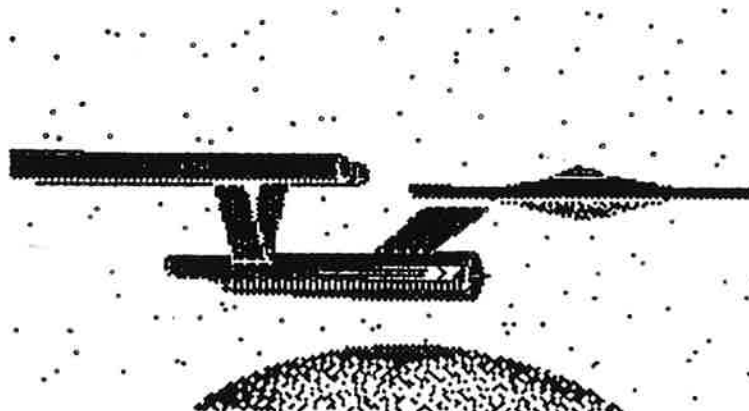
```
5000 IF PEEK(st+12) = 1 GOTO 5020
5010 IF fb% > 1 OR fc% > 2 GOTO 5100
5020 PRINT CHR$(7); : GOTO 4000
5100 VTAB 23: PRINT " press 'c' to copy file ..."
5110 GET go$: IF go$ = "c" OR go$ = "C" GOTO 5200
5120 VTAB 23: PRINT: GOTO 4000
5200 VTAB 23: PRINT " creating file ..."
5205 POKE 65531, dd%: CALL 27704: IF dd% = 26 THEN VTAB 22: GOTO 5210
5207 IF PEEK(65535) <> 0 THEN VTAB 22: GOTO 5370
5210 POKE k2, dd%: POKE k4, st/256: POKE k3, st-PEEK(k4)*256
5220 nc% = PEEK(st+19)+256*PEEK(st+20): bu = (nc%-1)*4
5225 IF bu = 0 THEN bu = 1
5230 POKE k5, bu: CALL k1: er = PEEK(27647)
5240 IF er = 0 GOTO 5500
5250 POKE 65531, dd%: CALL 27704: IF dd% = 26 THEN VTAB 22: GOTO 5380
5360 VTAB 22: IF PEEK(65535) = 0 GOTO 5380
5370 PRINT " missing destination!!": GOTO 5450
5380 IF er = 22 THEN PRINT " bad block error!!": GOTO 5450
5390 IF er = 24 THEN PRINT " not EOS directory!!": GOTO 5450
5400 IF er = 6 THEN PRINT " filename already exists!!": GOTO 5450
5410 IF er = 13 THEN PRINT " no more room!!": GOTO 5450
5420 PRINT " file access error!!"
5450 VTAB 23: PRINT CHR$(7); " press any key ...": GET go$
5460 VTAB 22: PRINT: GOTO 4000
5500 POKE f2, dd%: POKE f3, PEEK(k3): POKE f4, PEEK(k4): CALL f1
5510 ON PEEK(27647) = 0 GOTO 5600: er = PEEK(27647): VTAB 22
5520 IF er = 22 THEN PRINT " bad block error!!": GOTO 5450
5530 PRINT " file access error!!": GOTO 5450
5600 POKE 64940, 208: POKE 64947, PEEK(64945): POKE 64948, PEEK(64946)
5610 POKE 64949, PEEK(st+21): POKE 64950, PEEK(st+22)
5620 POKE u2, dd%: POKE u3, PEEK(k3): POKE u4, PEEK(k4): CALL u1
5630 ON PEEK(27647) = 0 GOTO 5700: VTAB 22: GOTO 5530
5640 PRINT " file access error!!": GOTO 5450
5700 VTAB 22: PRINT " transferring file ...": PRINT
5710 ss% = PEEK(st+13)+256*PEEK(st+14)
5720 sd% = PEEK(64941)+256*PEEK(64942)
5800 z1% = nc%/10: z2% = nc%-10*z1%
5810 IF z1% = 0 THEN y = 0: nv% = 1: GOSUB 7000: GOTO 7200
5900 FOR y = 0 TO z1%-1: nv% = 0
5910 GOSUB 5930: NEXT y: IF z2% = 0 GOTO 7200
5920 y = z1%: nv% = 1: GOSUB 7000: GOTO 7200
5930 jj = 112: FOR x = 0 TO 9: GOTO 7010
7000 jj = 112: FOR x = 0 TO z2%-1
7010 sb% = ss%+y*10+x: VTAB 23: PRINT " reading: "; sb%
7015 FOR de = 1 TO 375: NEXT de
7020 POKE r2, ds%: POKE r3+1, sb%/256: POKE r3, sb%-256*PEEK(r3+1)
7030 POKE r4, jj: CALL r1: IF PEEK(27647) <> 128 GOTO 33000
7040 jj = jj+4: NEXT x
7100 jj = 112: IF nv% = 1 GOTO 7105
7102 FOR x = 0 TO 9: GOTO 7110
7105 FOR x = 0 TO z2%-1
7110 db% = sd%+y*10+x: VTAB 23: PRINT " writing: "; db%
7115 FOR de = 1 TO 375: NEXT de
7120 POKE w2, dd%: POKE w3+1, db%/256: POKE w3, db%-256*PEEK(w3+1)
7130 POKE w4, jj: CALL w1: IF PEEK(27647) <> 0 GOTO 34000
7140 jj = jj+4: NEXT x: RETURN
7200 VTAB 22: PRINT " file copy complete!!"
7210 VTAB 23: PRINT " press any key ...": GET go$
7220 VTAB 22: PRINT: PRINT: GOTO 3100
```

EZfileXFER LIST continued ...

```

30000 FOR x = 1 TO 5: PRINT " "; x; " = "; dv$(x): NEXT
30010 GET k$: k% = VAL(k$): IF k% = CHR$(27) GOTO 500
30020 IF k% < 1 OR k% > 5 THEN PRINT CHR$(7); : GOTO 30010
30030 dv% = dv%(k%): RETURN
30100 IF dv% = 9 THEN PRINT dv$(1)
30110 IF dv% = 24 THEN PRINT dv$(2)
30120 IF dv% = 4 THEN PRINT dv$(3)
30130 IF dv% = 5 THEN PRINT dv$(4)
30140 IF dv% = 26 THEN PRINT dv$(5)
30150 RETURN
30200 HOME: PRINT " error on "; : GOSUB 30100: PRINT
30210 er = PEEK(65535)
30220 IF er = 1 THEN PRINT " NO SUCH DRIVE": CALL 64605
30230 IF er = 2 THEN PRINT " BAD BLOCK"
30240 IF er = 3 THEN PRINT " MISSING MEDIA"
30250 IF er = 4 THEN PRINT " DRIVE TURNED OFF"
30260 VTAB 10: PRINT " press any key ...": GET go$: GOTO 500
30300 POKE r2, ds%: POKE r3, fb%: POKE r4, 100+fb%*4
30310 IF fb% = 1 THEN GOSUB 30500
30320 CALL r1: RETURN
30400 HOME: PRINT " read error on block "; PEEK(r3)
30410 PRINT " of "; : dv% = ds%: GOSUB 30100: GOTO 30260
30500 HOME: PRINT " one moment please ...": RETURN
31000 VTAB 10: HTAB 2: INVERSE: PRINT sp$: VTAB 13: HTAB 2: PRINT sp$
31010 NORMAL: VTAB 11: HTAB 2: PRINT "source (from):"
31020 VTAB 11: HTAB 20: dv% = ds%: GOSUB 30100
31030 VTAB 12: HTAB 2: PRINT "destination (to):"
31040 VTAB 12: HTAB 20: dv% = dd%: GOSUB 30100
31050 VTAB 15: PRINT " * arrows scroll directory"
31060 PRINT " * <home> restarts directory"
31070 PRINT " * <store> copies file to DEST"
31080 PRINT " * <escape> exits to main menu"
31090 VTAB 20: HTAB 2: INVERSE: PRINT sp$: NORMAL: RETURN
32000 VTAB 23: HTAB 2: PRINT " reading block ...": GOSUB 30300
32010 IF PEEK(27647) = 120 THEN VTAB 23: PRINT: RETURN
32020 VTAB 22: PRINT " read error on block "; PEEK(r3); CHR$(7)
32030 VTAB 23: PRINT " press any key ...": GET go$
32040 VTAB 22: PRINT: PRINT: POP: fb% = fb%-1: GOTO 3210
33000 VTAB 22: PRINT " read error on block "; PEEK(r3)+256*PEEK(r3+1)
33010 PRINT CHR$(7); : POP: GOTO 7210
34000 VTAB 22: PRINT " write error on block "; PEEK(w3)+256*PEEK(w3+1)
34010 PRINT CHR$(7); : POP: GOTO 7210

```



ADAM: SIGHT & SOUND

This is the first in a new series of articles concentrating on ADAM's video and sound chips. This month we'll continue with last issue's HACKER'S DELIGHT articles. In the month's to come, we'll take a detailed look at these two chips.

CONTINUING ezFILER

The next page (# 20) contains a program that will create the graphic screen bootstrap for ezFILER. In truth, you could use this program and last month's two graphics file programs to start any SmartBASIC medium with a nice graphics screen. You pull the reset and within a few seconds the hi-res screen is displayed while BASIC loads into RAM. And, BASIC will load from ANY drive with the turnkey feature setup for that drive.

This program is a parallel of the "new BASIC bootstrap" routine we LISTed in our November 1986 issue. That program displayed a TEXT screen while BASIC loaded into memory.

The bootstrap routine with this one is very similar. Each of the VDP screen registers must be setup. Then the bit image data is read from the disk or data pack and transferred into VRAM. Now the bootstrap routine fills in the color.

Next month we'll continue the discussion of "ezFILER" in the HACKER'S DELIGHT department.

THE VIDEO REGISTERS

The video chip has nine registers of its own -- register "0" is for graphics mode selection. A value of "two" selects "graphics mode two" or HGR2 (HGR and GR are user variations of HGR2). A value of "zero" deselects "graphics mode two". Register "1" is for video mode selection. Modes are selected by changing specific bit values; We'll explain this one in more detail later.

Registers "2" thru "6" are the VRAM table pointers. They setup for sprites, bit images, and screen colors. We'll study these in detail too.

Register "7" is the border background color control. In 40 column text mode, this register's value determines the SET, RESET, and border color. Register "8" is a status register for checking on sprites.

SCROLLING A HI-RES SCREEN

The program LISTed at the bottom of page 14 will scroll an HGR screen up one row at a time with each CALL 27600. The Z80 routine is not address specific -- it could be located anywhere in RAM.

This program draws its own simple graphics screen as a demonstration; but, you could use it in your games, for example, to create an interesting effect. Moreover, by changing a few of the byte values (which we will do in an upcoming issue) you could scroll any specified region of the hi-res screen. We'll also present a downward scroll routine, a left shift routine, and a right shift routine in future issues.

THE PUFF SOUND EFFECTS

Last month's arcade action game PUFF (pages 16 - 23) used many programming tricks including some appealing sound routines. The five byte routine on line # 131 is the basic sound input routine.

To access a voice you need to send three numbers (within certain ranges) to the chip. The first tonal byte is a value of "0" to "15" (inclusive) plus a voice offset. The second tonal byte is a value of "0" to "63", inclusive. And, the final byte is the volume with a value of "0" thru "15" plus another voice offset value.

PUFF includes three simple melodies: the attract song at the beginning, the "charge" tune, and the "winner" melody. The data for each note in these tunes consists of two bytes. (consider line # 151, for example). The first data element is the second tonal value; the first tonal value is the same throughout. The second data element is the duration that the note will be played.

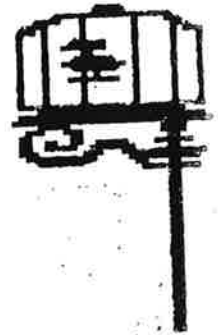
Turning a note off causes a clicking noise. The Z80 routine on line numbers 141 and 142 get around this by turning a note off slowly. This, routine causes the "ping" sound that you hear when a key is pressed.

- more next month -

```

10 REM This program creates a new bootstrap routine
20 REM for SmartBASIC 1.0 to display a hi-res picture while
30 REM the interpreter loads into RAM.
40 REM Use "BootPic Maker" and "BootPic Writer" from the
50 REM 08/87 issue of N&B to create the picture file.
60 REM Use BASICxfer from the 12/86 issue of N&B to transfer BASIC.
70 REM after RUN, CALL 27600 to write to medium
100 LOMEM :45000
120 FOR x = 108*256 TO 112*256-1: POKE x, 0: NEXT
130 DATA 1,128,1,205,32,253
140 DATA 1,2,0,205,32,253
150 DATA 62,0,17,0,24,33,0,32,205,38,253
160 DATA 62,27,17,0,24,33,0,0,205,38,253
165 DATA 62,0,17,0,2,33,0,24,205,38,253
170 DATA 33,0,0,62,4,205,41,253
180 DATA 33,0,32,62,3,205,41,253
190 DATA 33,0,24,62,2,205,41,253
200 DATA 6,3,33,0,24,175,197,245,229,17,1,0,205,38,253
210 DATA 225,241,35,60,32,242,193,16,237
390 DATA 1,11,7,205,32,253
400 DATA 1,192,1,205,32,253
402 DATA 62,75,17,0,1,33,0,9,205,38,253
404 DATA 62,107,17,0,6,33,0,11,205,38,253
410 DATA 58,111,253,1,0,0,17,2,0,33,0,136,205,243,252
415 DATA 58,111,253,1,0,0,17,3,0,33,0,140,205,243,252
420 DATA 58,111,253,1,0,0,17,4,0,33,0,144,205,243,252
425 DATA 58,111,253,1,0,0,17,5,0,33,0,148,205,243,252
430 DATA 58,111,253,1,0,0,17,6,0,33,0,152,205,243,252
435 DATA 33,0,136,17,0,32,1,0,20,205,26,253
440 DATA 6,30,62,128,211,224,120,211,224,62,146,211,224
442 DATA 17,0,15,27,122,179,32,251,5,16,234,62,159,211,224
450 DATA 58,111,253,6,1,33,0,203,205,192,252,194,231,252
455 DATA 1,0,112,33,0,1,205,210,252,194,231,252,62,1,205,195,252
460 DATA 58,111,253,50,1,65,195,0,1
489 DATA 205,108,252,48,251
490 DATA 201,-1
500 st = 27648: tt = 0
510 READ mc: IF mc = -1 GOTO 530
520 POKE st, mc: st = st+1: tt = tt+mc: GOTO 510
530 IF st = 27936 AND tt = 26979 GOTO 600
540 PRINT " incorrect data total.": END
600 k$ = "BASICPGM"+CHR$(2)+CHR$(3)
610 FOR x = 1 TO LEN(k$): POKE x+111*256-1, ASC(MID$(k$, x, 1)): NEXT
700 REM change second data element in # 710 for your drive
701 REM (4 = disk one & 0 = tape one)
710 DATA 62,4,1,0,0,17,0,0,33,0,108,205,246,252,50,255,107,201
720 FOR x = 27600 TO 27617: READ mc: POKE x, mc: NEXT

```



EXPLORING CP/M 2.2

by Guy Cousineau

Writing programs in CP/M is complicated at first, to say the least. A good beginner's book, lots of practice, and a lot of patience will yield good results. Once you get by screen input and output, playing question and answer, or dabbling with arithmetic routines, you will want to move on to bigger and better things: WRITING TO FILES.

Now we have to learn another big part of CP/M -- the file control block, or FCB. The FCB is used whenever a file is opened or closed to keep track of where everything is.

The CCP (Console Command Processor) uses the FCB to place parameters in your command line since, most of the time, your parameters will be file names. For example, when you enter "ERA FILE.TYP", "FILE.TYP" is placed in the FCB and then used by the CCP erase function to delete the file. If you used a transient command such as "PIP A.COM B:B.COM", "A.COM" and "B.COM" would be placed in the FCB and then used by the PIP program to move the files as requested.

There are two partial file control blocks in zero page, one at 5CH and the other at 6CH. Each is 16 bytes in length and is used to place the first and second file name of your command line.

The first byte of a standard 37 byte FCB is the drive code. Here "1" means drive "A", "2" means drive "B", and so on. Zero signifies the default drive that you are currently logged into. This code is placed in the low order nibble and, in special circumstances, the user code is placed in the high order nibble. This is why there is a limit of 16 drives and 16 users on a CP/M system.

Bytes "1" thru "8" are used for the primary file name, ie, the part appearing before the ".". If your primary filename is longer than eight characters, the CCP will truncate it for you. Any applications programs that you write should also do the same.

Bytes "9" thru "11" hold the filetype, a maximum of 3 characters. Byte 12 holds the extent number. This indicates the number of 16K segments in a file. A 20K file, for instance, would have the first 16K in extent "0" and the last 4K in extent "1".

Bytes "13" to "15" are system control bytes. The BDOS (Basic Disk Operating System) uses them for several checks and controls. For now let's just say that you must set them to zero before opening a file. A good CCP will do this for you, but you must include it in your own programs.

Byte "16" holds the record count for the extent. Since there are eight 128 - byte records per "K", just knowing how many "K" there are in a file is not enough. This byte can be compared with the "bytes used in last block" for ADAM EOS FCB's.

Bytes "17" thru "32" hold the allocation numbers. Because CP/M treats disks as random access, instead of sequential as the EOS does, we must know where each block of a file is written on the disk.

Byte "33" holds the current record count. This is the record being written to or read from.

Bytes "34" to "36" are used with random files to determine the record number.

This covers the introduction to the file control block. Next month we'll look at how the BDOS and applications programs use the FCB data.

Guy Cousineau
1059 Hindley Avenue
Ottawa, Canada
K2B 5L9

PRODUCT:	Video Titles
MANUFACTURER:	SKALA Enterprises
MEDIA TYPE:	DDP
GRAPHICS/SOUND/DESIGN:	85;80;80
INSTRUCTIONS:	75
USEFULNESS vs. PRICE:	80
RECOMMENDATION:	recommended
PRICE:	\$19.00
RATED BY:	Hector Sanchez

Video Titles, which is written in SmartLOGO, is a program used to create titles on ADAM for recording them on your VCR tapes. You must, of course, hook up ADAM to your VCR. Video Titles allows you to enter a title simply by typing on the keyboard. The title will then be printed on your screen as giant letters. You have eight rows and eleven columns to work with. You can also create a flashing border; it looks like a movie theater entrance. You can also play pre-programmed music to go along with your title. The title stays on your screen long enough to permit you to record the it.

I do have a few problems with this software. First, while you can have a title with a flashing border, or a title with a song, you can not have all three (title, flashing border, and music) at the same time. Secondly, I wish there was more to this program. For \$19.00 it should also include a Video Tape Management program (even if it is written in BASIC). This way, you could keep track of your VCR tapes, print a catalog, and print labels for your tapes. Thirdly, I wish it had more than one font to work with.

On the other hand, there are many good aspects to the program. It has pretty good graphics and it is written in LOGO. This is the first good commercial LOGO program that I know of; I don't think it could have been written in BASIC. My Coleco LOGO program finally came off the shelf.

PRODUCT:	MEGACOPY
MANUFACTURER:	TRISYD VIDEO
MEDIA TYPE:	DDP / disk
GRAPHICS/SOUND/DESIGN:	80;30;99
INSTRUCTIONS:	98
USEFULNESS vs. PRICE:	98
RECOMMENDATION:	highly recommended
PRICE:	\$60.00
RATED BY:	Lewis R. Clancy

MEGACOPY is a software and hardware package that permits you to FORMAT ordinary audio cassettes into digital data packs for use on ADAM. Mr. Syd Carter, of TRISYD VIDEO, has done very well in writing a simple, easy-to-follow program; complete instructions are in the program's menus. This program does not have, nor does it need, elaborate sound.

MEGACOPY first permits testing and synchronizing of both digital data drives including instructions on how to calibrating drive speeds. Currently there are 10 format options, ranging from formatting a standard C-60 center directory tape to single - sided either C-60 or C-45 tapes in either right or center directory. This allows for single or double directory (sided) tapes. The version I have is "V4" and includes better color and better access to a HELP screen or previous menu than the earlier version. The program comes with some advertisements and Mr. Carter is willing to sell in quantities as well as trade software.

This product may be a little much for individual ADAM owners, but I feel each Users' Group should have access to this product.

PRODUCT:	MX-256 & MX-512
MANUFACTURER:	ORPHANWARE
MEDIA TYPE:	DDP / disk
GRAPHICS/SOUND/DESIGN:	n/a;n/a;99
INSTRUCTIONS:	98
USEFULNESS vs. PRICE:	99
RECOMMENDATION:	highly recommended
PRICE:	\$165 & \$205
RATED BY:	Solomon Swift

ORPHANWARE has certainly opened the door for a lot of powerful, new software for ADAM owners with their "BIG" RAM expansion cards. The MX-256 adds 256K RAM and the MX-512 adds 512K RAM. Each unit is comprised of two cards connected by a small wire; the addresser plugs into the middle slot inside the memory console and the RAM card plugs into the third slot (from the left) just as a standard 64K card does. You have three purchase options with the addresser: (1) you can buy the addresser for \$17.50, (2) you can send in your PIA2 parallel interface which will be modified to double as an addresser, or (3) you can purchase the PIA2 with the RAM board at the discount price of just \$29.95. The two units (MX-256 and MX-512) are very similar in appearance; the larger XRAM card has 8 additional RAM chips "piggy - backed" atop the others. Both units fit inside the console without any difficulty.

The quality of third party (including ORPHANWARE) hardware for ADAM is usually excellent. I originally had two concerns regarding these products. One was a potential interference with my EVE parallel interface and the other was potential overheating (I rarely turn off my personal ADAM -- never leave disk drives on). Neither unit causes any problems with the parallel interface and I've had the MX-256 plugged in for weeks with absolutely no indication of overheating. I mention these two concerns only because others may have the same questions.

Both XRAM cards come with a CP/M formatted disk which includes full installation and program instructions and a lot of powerful CP/M patches. After you've followed the instructions, you'll have CP/M set up for serial / parallel output, 80 column video (if you have an 80 column card), single or double sided disk drives (any combination!!), and a very large ramdisk (drive M) on cold boot!

I was so impressed with these ORPHANWARE hardware innovations that I immediately wrote our latest DIGITAL EXPRESS commercial program MegaDISK 1.0. This software gives the very large, super fast ramdisk capability for SmartBASIC V1.0 and your own z80/EOS programs.

PRODUCT:	FILE PRINTER
MANUFACTURER:	Terry Fowler
MEDIA TYPE:	DDP / disk
GRAPHICS/SOUND/DESIGN:	n/a;n/a;96
INSTRUCTIONS:	95
USEFULNESS vs. PRICE:	96
RECOMMENDATION:	highly recommended
PRICE:	\$9.95
RATED BY:	N&B staff

Terry Fowler, editor of the qHAAUG newsletter, has assembled a fine set of word processing enhancements in his program entitled FILE PRINTER. The program, designed for Panasonic KX series parallel dot matrix printers, allows you to print SmartWriter compatible documents using many of your printer's special codes. You can use different pitches (character widths), different fonts (italics, NLQ, super and subscript), two margin settings, and you can use the line justification functions. To access the functions, you insert embedded commands (for example, ^C for centering) within your document, store the file, and then boot the FILE PRINTER disk (or DDP).

After BASIC loads, you're presented with a menu screen of three options: (1) newsletter column printer, (2) SmartWriter file printer, and (3) dot matrix printer function preset. Option "2" will print the SmartWriter file with your print selections; this turns out a very impressive hardcopy. Option "1" prints your SmartWriter document on the left side of the page (with the nice print enhancements). Option "3" allows you to set up your printer with the print options of your choice. This one is very useful for printing a particular typeset for an entire document. The print functions will remain in effect until you reset the printer. You can use this option and then boot FASTPATCH (by ORPHANWARE) or a similar program to have those preset features available with SmartWriter, SmartFILER, or ADAMCalc without having to enter any control codes.

FILE PRINTER offers a lot of print control and the price is exceptionally reasonable.

PRODUCT:	TurboDISK 2.0
MANUFACTURER:	DIGITAL EXPRESS
MEDIA TYPE:	DDP / disk
GRAPHICS/SOUND/DESIGN:	n/a;n/a;99
INSTRUCTIONS:	95
USEFULNESS vs. PRICE:	99
RECOMMENDATION:	highly recommended
PRICE:	11.95
RATED BY:	D.L. Decker

President of D.L. DECKER ENTERPRISES

TurboDISK 2.0 is another excellent utility program for the ADAM. Designed by the fine software engineers at DIGITAL EXPRESS, this program is sorely needed by those who use SmartBASIC V2.0. TurboDISK 2.0, like its counterpart, TurboDISK 1.0 (reviewed in the June 1987 issue of N&B), allows you to use the 64K expansion card (sold separately) as a fast disk drive. The "RAM DISK" created by TurboDISK 2.0 allows the user to have extremely fast retrieval and storage of programs while using SmartBASIC V2.0. Once again, as with all of DIGITAL EXPRESS' fine ADAM utilities, TurboDISK 2.0 recognizes all SmartBASIC V2.0 commands, with the exception of the EXTMEM (extended memory) command.

Documentation is written in a truly professional style and describes functions and operation of the program in easily comprehensible terms. When TurboDISK 2.0 was tested with a SmartBASIC V2.0 demo program, the storage/retrieval functions of TurboDISK 2.0 worked flawlessly.

Like TurboDISK 1.0, this software introduces a "ramdiskNOT" feature to BASIC, which allows the user to save a program to the 64K card, leave SmartBASIC, and use another COLECO title (assuming the COLECO title does not access the 64K card). When the user is ready to return to SmartBASIC V2.0, he/she can do so WITHOUT initializing the ramdisk by using the "ramdiskNOT" command. This feature is very helpful for programmers who are constantly loading files from data pack or disk then returning to their their programming after a break -- files stored to the ramdisk can be retrieved in seconds rather than minutes!

Overall, this program is well worth the investment. Hopefully, DIGITAL EXPRESS will consider developing ramdisk software for the newly released ORPHANWARE 128K and 256K expanders. If software which accesses these expanders from BASIC is possible, I'm certain that the excellent programmers at DEI will introduce a title with all of the features of TurboDISK 1.0 and TurboDISK 2.0. As with other DEI software titles, this software is very reasonably priced (\$11.95) and is a welcome addition to any ADAM library.

NOTE: D.L. DECKER ENTERPRISES is an independent software firm and is not affiliated with DIGITAL EXPRESS in any manner.

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Note -- You will need either the addresser or a PIA2 to operate the large expander. We will sell the PIA2 for \$29.95 when purchased with the MX256 or MX512	
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Shipping is \$3.00 for all but the 80 CVU or the serial port and modem. Include \$8.00 for those items.

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NEWS UPDATE

ORPHANWARE has slashed prices on XRAM boards

MX-256 is now \$115 (was \$165)

MX-512 is now \$235 (was \$285)

- get one today -

MegaDISK 1.0 is here ...

Now you can access ORPHANWARE's BIG RAM expansion cards (MX-128, MX-256, and MX-512) from SmartBASIC V1.0 or your own Z80/EOS programs as a *super-fast, super-large* ramdisk. You have two ramdisk size options and you INIT the ramdisk -- this gives your ramdisk a relative permanency. The program automatically checks the size of your XRAM-card for you. And, the package comes with five public domain programs including "EZfileXFER" (a user - friendly program for transferring files between two mediums -- disk, data pack, or ramdisk).

With the MX-256 you get a 249K ramdisk and with the MX-512 you get a 497K ramdisk!!! Faster than a disk drive ... it's **MegaDISK 1.0**!!! Just \$24.95 retail and N&B subscribers can get it for only \$19.95. Another fine product from DIGITAL EXPRESS.

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AUG of San Diego County
Sue Askew
868 North 2nd Street, #242
El Cajon, CA 92021

Inland Empire AUG
Tom & Wendy Ball
P.O. Box 2210
Rialto, CA 92376

Frank Fleich
13381 - 19 Magnolia Avenue
Corona, CA 91719

Bay Region ADAM Info (BRAIN)
George Havach
550 27th Street, #202
San Francisco, CA 94131

AUG SOCAL
Harvey Klein
1736 South Bedford Street
Los Angeles, CA 90035

Ann Quetel
1154 North Mayfield Avenue
San Bernardino, CA 92410

Brian Stranahan
8580 Buggy Whip Road
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New newsletter: ADAM'S ALIVE
E & T SOFTWARE
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- sharply duplicated game instructions -
send S.A.S.E. for list
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□□□ Intel-LOAD V2.0 (by DIGITAL EXPRESS)
* converts BASIC 2.0 programs to LOAD up to 12 times faster; stays in RAM; onscreen help; two BSAVE options; works only in STD MEM

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>>> \$11.95 (each) for N&B subscribers

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* makes several changes to SmartBASIC V1.0; not compatible with Intel-BEST 3.3

>>> \$16.95 (each) retail price
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□□□ SmartTRIX I (by DATA DOCTOR)
* a set of 10 user friendly programming aids; two very nice sprite programs; 60 page manual; disk and DDP versions not compatible

>>> \$29.95 (each) retail price
>>> \$24.95 (each) for N&B subscribers

□□□ BASICaide (rev2) (Mr. T. Software)
* several SmartBASIC 1.0 enhancements including a new "CHAIN" command for merging programs and a new "BIN" command that executes the built-in function for converting SmartBASIC 1.0 programs to LOAD up to 12 times faster

>>> \$11.95 (each) retail price
>>> \$9.95 (each) for N&B subscribers

□□□ TurboDISK 1.0 (by DIGITAL EXPRESS)
* creates a ramdisk ability from SmartBASIC V1.0; corrects INIT blocks and BSAVE short buffer; includes TurboCOPY -- a utility for controlling files and copying copy buffer

>>> \$24.95 (each) retail price
>>> \$19.95 (each) for N&B subscribers

□□□ FontPOWER (by DIGITAL EXPRESS)
* utility using Coleco-like graphics for designing your own font sets; 8 font sets including "script", "roman", "cory", & "bold"; shows you how to use font sets in high or low resolution graphics; plus three font shape tables for use in HGR or HGR2 mode

>>> \$16.95 (each) retail price
>>> \$12.95 (each) for N&B subscribers

□□□ SpritePOWER (by DIGITAL EXPRESS)
* utility using Coleco-like graphics for designing your own sprites; includes three sets of sprites; extensive instruction manual; shows you how to use the sprites in your own programs; does NOT require the 64K RAM card; totally machine code program (36K)

>>> \$19.95 (each) retail price
>>> \$14.95 (each) for N&B subscribers

□□□ MegaUtil (by MARATHON COMPUTER PRESS)
* an excellent collection of varied programming aids; includes ByteWriter (block editor), CopyWriter (media back-up utility), PD modules, programming tips, more +++

>>> \$32.95 (each) retail price
>>> \$27.95 (each) for N&B subscribers

□□□ TurboDISK 2.0 (by DIGITAL EXPRESS)
* creates a powerful ramdisk ability for SmartBASIC 2.0

>>> \$15.95 (each) retail price
>>> \$11.95 (each) for N&B subscribers

□□□ Clipper (by DIGITAL EXPRESS)
* introduces the concept of "clip art" to ADAM; totally machine code program; clip a section from one hi-res screen and put it on another (in your own programs); evens includes an option to let you draw clip art

>>> \$19.95 (each) retail price
>>> \$14.95 (each) for N&B subscribers

RECREATION/GAMES SOFTWARE

□□□ MageQuest (rev 2) (by REEDY SOFTWARE)
* superb graphic adventure; includes 9 levels of play in the main adventure plus 3 solo adventures; additional solo adventures are available from REEDY SOFTWARE

>>> \$16.95 (each) retail price
>>> \$14.95 (each) for N&B subscribers

□□□ TRIVIAPAC I (by Mr. T. Software)
* 1200 questions; 6 categories; one to four players; graphics and sound; many hours of fun; DDP version only

>>> \$17.95 (each) retail price
>>> \$14.95 (each) for N&B subscribers

□□□ KID'S TRIVIAPAC (by Mr. T. Software)
* 1080 questions; 6 categories; one to four players; graphics and sound; many hours of fun; DDP version only

>>> \$17.95 (each) retail price
>>> \$14.95 (each) for N&B subscribers

□□□ Strategy Strain (by DATA DOCTOR)
* nine intellectually challenging computer classics; graphics and sound; superb Star Trek adventure

>>> \$18.95 (each) retail price
>>> \$14.95 (each) for N&B subscribers

□□□ Lab Mouse (by REEDY SOFTWARE)
* exciting game that puts you in the role of a laboratory mouse stuck in a maze; all hi-res graphics; five skill levels; auto-loading

>>> \$13.95 (each) retail price
>>> \$11.95 (each) for N&B subscribers

□□□ Entertainment Pack (by REEDY SOFTWARE)
* three challenging computer classics (connect 4, blockade, and slide puzzle); great graphics; fast animated sprites; one or two players

>>> \$16.95 (each) retail price
>>> \$14.95 (each) for N&B subscribers

GUIDES/BOOKS/INSTRUCTIONS

□□□ The Hacker's Guide to ADAM (vol one)
* Ben Hinkle's in-depth guide to the technical aspects of exploring ADAM; 60 pages; 18 programs

>>> \$12.95 (each) retail price
>>> \$10.95 (each) for N&B subscribers

□□□ The Hacker's Guide to ADAM (vol two)
* Ben Hinkle's detailed guide to SmartBASIC V1.0; 110 pages; HELLO program includes several BASIC enhancements

>>> \$12.95 (each) retail price
>>> \$10.95 (each) for N&B subscribers

□□□ Hacker's Guide software (by Ben Hinkle)
* all the programs from volumes one and two

>>> \$5.95 (each) retail price
>>> \$4.95 (each) for N&B subscribers

□□□ EZ Ref 101 (by DIGITAL EXPRESS)
* approximately 700 Z80 instructions listed in NUMERICAL sequence; 9 pages; decimal, hex, op codes, operands

>>> \$2.45 (each) retail price
>>> \$1.95 (each) for N&B subscribers

□□□ EZ Ref 102 (by DIGITAL EXPRESS)
* approximately 700 Z80 instructions listed in ALPHABETICAL sequence; 9 pages; decimal, hex, op codes, operands

>>> \$2.45 (each) retail price
>>> \$1.95 (each) for N&B subscribers

□□□ Pinball Construction/HardHat Mac Guides
* 40 pages of instructions for the popular public domain package

>>> \$2.45 (each) retail price
>>> \$1.95 (each) for N&B subscribers

MISCELLANEOUS UTILITY SOFTWARE

□□□ ShowOFF I (by DIGITAL EXPRESS)
* self-booting graphics design package (enter text, draw polygons, save pictures, etc.) with a variety of print options (preset for Epson FX / IBM 5152 printer codes); printing graphics requires a Centronics parallel interface for printer

>>> \$29.95 (each) retail price
>>> \$24.95 (each) for N&B subscribers

□□□ ShowOFF II (by DIGITAL EXPRESS)
* machine code print enhancements for SmartWriter (adds CONTROL features to SmartWriter) and SmartBASIC; requires Centronics parallel interface, a Panasonic KX 1080 or 1080i printer, and a 64K expander

>>> \$19.95 (each) retail price
>>> \$14.95 (each) for N&B subscribers

□□□ ShowOFF IIa (by DIGITAL EXPRESS)
* very similar to ShowOFF II except that it is compatible with any dot matrix printer that supports EPSON FX escape codes; works with the EPSON and STAR line of printers and the Okimate 20; does not include line justification commands or internal document margin control

>>> \$19.95 (each) retail price
>>> \$14.95 (each) for N&B subscribers

"NIBBLES & BITS" SOFTWARE

□□□ N&B binder set 01 (by DIGITAL EXPRESS)
* all six issues from 07/86 thru 12/86 in a sturdy 3-ring binder; includes two DDP's or two disks containing all the programs

>>> \$29.95 (each) retail price
>>> \$24.95 (each) for N&B subscribers

□□□ N&B binder set 02 (by DIGITAL EXPRESS)
* all six issues from 01/87 thru 06/87 in a sturdy 3-ring binder; includes two DDP's or two disks containing all the programs

>>> \$29.95 (each) retail price
>>> \$24.95 (each) for N&B subscribers

□□□ N&B issue programs (by DIGITAL EXPRESS)
* set 01: all the programs from 07/86 thru 09/86
* set 02: all the programs from 10/86 thru 12/86
* set 03: all the programs from 01/87 thru 03/87
* set 04: all the programs from 04/87 thru 06/87
* set 05: all the programs from 07/87 thru 09/87

>>> \$7.95 (each) retail price
>>> \$4.95 (each) for N&B subscribers

COLECO COPYRIGHTED SOFTWARE

□□□ SmartLOGO (data pack only)
* Coleco's version of the popular language; 350 ++ page manual

>>> \$25.95 (each) retail price
>>> \$21.95 (each) for N&B subscribers

□□□ SmartFiler (data pack only)
* Coleco's general purpose database program; 38 page manual

>>> \$18.95 (each) retail price
>>> \$15.95 (each) for N&B subscribers

DEI Public Domain Facts

You may get any of the volumes described below on DATA PACK or DISK for ONLY \$5.95. Subscribers also have an option to get a volume FREE (limit three per calendar month); this option does NOT apply to the volumes in the "Coleco Unreleased Titles Library".

Here's how to get one FREE. (1) Contribute an original program for any library. (2) Send a signed statement that the program is NOT copyrighted. (3) Send the program on DDP (digital data pack) or disk; one DDP or disk for each volume that you want to exchange. And, (5) include a return mailer with sufficient postage or send \$2.50 for shipping costs.

Public domain software is offered as a quick, inexpensive means for you to expand your ADAM software library. Note, however, that public domain software is not necessarily of commercial quality. Although we do attempt to winnow out flawed programs, there is no guarantee of quality regarding these packages.

SmartBASIC V1.0 LIBRARY

You must boot your own SmartBASIC first in order to use the volumes in this library. 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.

"N&Bgames01": An assortment of text adventures, board games, and animation games -- 130K of files.

"N&Bgames02": An assortment of text adventures, board games, and animation games -- 154K of files.

"N&Bgraph01": A variety of graphics displays and music programs -- 88K of files.

"N&Bmath01": Several scientific and financial math programs -- 114K of files.

"N&Butil01": Intended for more advanced programmers this volume includes programming utilities -- 108K of files.

SmartPAINT Files LIBRARY

In order to view/use the volumes in this library you should have SmartPAINT (from ShowOFF I) or the HGR Picture Manager program in the February 1987 issue of "NIBBLES & BITS" (page 16).

"N&Bpix001": 13 different HGR picture files.

"N&Bpix002": 13 different HGR picture files.

"N&Bpix003": 13 different HGR picture files.

"N&Bpix004": 13 different HGR picture files.

"N&Bpix005": 13 different HGR picture files.

"N&Bpix006": 13 different HGR picture files.

"N&Bpix007": 13 different HGR picture files.

"Art Gallery 2": 13 picture files of Smurf-like characters. Compiled by REEDY SOFTWARE.

Coleco Unreleased Titles LIBRARY

"SmartBASIC 2.0": Improved interpreter; 49K program; works with or without the 64K expander; includes new commands STDMEM, EXTMEM, MERGE; plus more ...

"Pinball Construction/Hardhat Mac": Best of Electronic Arts; latest version with two demo pinball games; 1 to 4 players with Pinball Construction; one or two players with Hardhat Mac.

"ADAMLink II": Supports uploading and downloading of SmartWriter compatible files; includes U/D instructions; requires the ADAMLink modem.

"Jeopardy": The extremely popular ADAM game; just like the game show; great graphics; hall of fame; one to three players.

"Super SubRoc": 90K arcade-type game; super graphics; hall of fame.

"Troll's Tale": Easy to play graphic/text adventure; supports one player; disk and DDP versions NOT compatible.

"Video Hustler": Graphic billiards game; one or two players; from an unreleased cartridge.

CP/M 2.2 LIBRARY

The volumes in this library require that you boot your own CP/M 2.2 package first.

"CP/Mgames01": 30 games.

"CP/Mgames02": 25 games.

"demo carts": requires 64K expander; music samples, system tester, Coleco software demo cart, Coleco back-up utility, plus more.

Pinball Games LIBRARY

Each volume in this library is self-booting or may be used with the Pinball Construction Set.

"N&B-PBgames01": 10 pinball games.

"N&B-PBgames02": 10 pinball games.

Miscellaneous Collections LIBRARY

"MWplus01": A collection of improvements to MultiWrite by Strategic Software. Requires MultiWrite software. Written by Jim Guenzel.

"N&Bacalc01": several paradigm and other files stored in ADAMcalc format; contributed by Terry Fowler; 148K of files.

"EZpak": a self-booting disk / DDP makes a great medium to store your own files on; contains EZmenu and EZcopy.

"ezFILER": a self-booting disk / DDP containing an address filer utility with advanced print options; graphics screen after reset.

"SHAPEMAKER": a large collection of font shape tables; a very nice hi-res shape design utility; several demonstration programs and instruction files. Written by Guy Cousineau.