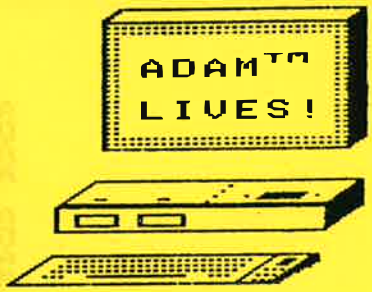
NIBBLES & BITS

the comprehensive monthly newsletter for ADAM users

P.O. Box 37
Oak Hill, WV 25901



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DESIGNED and PRINTED entirely 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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CREATIVE COMPUTING
for the ADAM

EDITOR'S NOTE

The holiday season is upon us again. And, we're about to embark on a new year; 1987 certainly has passed quickly for me. How about you?

This is traditionally a special time of the year for giving thanks, reflecting on the past, and looking to the future. You'll see a column in this issue where I give thanks to the many ADAM owners who've helped to make DIGITAL EXPRESS the success that it is today. The quality of our newsletter, our public domain programs, and our commercial software is certainly a matter of personal opinion. But, there is little room for doubt that we are one of the most prolific companies to support the ADAM computer.

When Coleco first announced they were to discontinue production of the ADAM, the future of the orphaned computer was uncertain. Today there is an abundance of good software, a variety of powerful hardware attachments, and numerous informative newsletters. Along with this commercial support, there are scores of ADAM users' groups and thousands of public domain programs. The impetus behind all this growth is the many, many thousands of active ADAM owners.

What does the future hold in store for us? We're about to see some new hardware and software developers enter the ADAM market; more on this in upcoming issues. Peripherals and interfaces are generally all of excellent quality; and, software is getting more professional and more diverse in nature. In short, ADAM has a strong future ahead.

In the early part of '88 we'll be releasing our GO-DOS package. My goal is to bring the "desktop metaphor" to ADAM this release. The new operating system will allow the programmer to select icons or SmartKEYs to drive his/her creations. More on this later in the issue.

One package that we'd hoped to release this year was SmartTUNES. With the time factors involved, we've decided (somewhat reluctantly) to drop the project. However, the good news is that we've donated a version of the primary "tune driver" into the public domain. You'll find it in this issue. Along with this, you'll find three Christmas carols in SmartTUNES format. I believe that even the more discriminating music lovers will admit that these songs bring out the best in ADAM's sound chip. In fact, with music appreciation rekindled at the holiday season, a rather significant portion of this issue is devoted to ADAM's music abilities.

Happy Holidays,

Solomon Swift
EDITOR

N&B NEWS

□□□ We've now got our 14th public domain volume of SmartPAINT (from ShowOFF I) pictures. You now have 188 pictures to choose from.

□□□ We are starting a PD library of assorted graphics files. Each volume will contain various font sets stored in FontPOWER format, sprite sets stored in SpritePOWER format, clip art files stored in CLIPPER format, and songs stored in SmartTUNES format. We've gotten started on the first volume, but we need more. Since these files, by nature, are small (2K or less), we ask that you contribute three of them in order to get another PD volume in exchange (free).

□□□ We've added Mr. T. Software's latest release, AUTOWRITER, to our product list. Also, see our review in this issue.

□□□ We've added Orphanware's MX-64 memory expander (64K) to our product list. The price is just $25.

□□□ We've recently updated all of our SmartBASIC PD volumes. Each volume is booted simply by pulling the computer reset. Thereafter, selections are made from a ramdisk central menu program (using standard RAM). If you have the older volumes, you can update for $1.00 each plus shipping (return the original disk or data packs). If you purchased the older version after September 1st, we'll update it free of charge. Be sure to include return shipping or request the updates with an order.

□□□ All of our issue programs are printed directly from BASIC using the LIST command; thus, each one should work correctly. On a couple of occasions, however, we've neglected to reset the POKE limit within the program (our interpreter is already patched for this). One such example is "MoreKEYS", LISTed in the AUGust issue (page 13). To get the program to work correctly, simply change line number 100 to the following:

```
100 LOMEM:28000: POKE 16149,255: POKE 16150,255
```

□□□ The VCR CONNECTION™. We just purchased a dealer's closeout inventory on a VHS package that you may find quite useful whether you've just purchased your VCR or have had it for a while. The kit includes (1) a library case for 12 VHS tapes, (2) a two-way coax cable splitter, (3) two 3 ft. coax cables, (4) one 6 ft. coax cable, (5) VCR dust cover (6) A/B input signal switch, (7) one VHS T-120 tape, (8) one VHS wet head cleaning system, and (9) detailed instruction manual. This unique, all-in-one package is especially useful for those who have cable with a converter box. This complete set retailed for $59.95; but while supplies last, we are offering this full accessory kit for just $15.95 to N&B subscribers. Get yours today.

ADAM NEWS

□□□ ORPHANWARE has had its new BBS in operation for a few weeks now. The system hours are: 9pm - 8am, Monday thru Friday and 7pm Saturday thru 8am Monday. The number is (216) 882 - 4720. Use 8 data bits, one stop bit, and no parity. The system features a message base for general communication and a few dozen files for downloading (XMODEM protocol only).

□□□ Walter's Software is offering an upgrade option for purchasers of their ramdisk utility for SmartBASIC 1.0 and 2.0. Just return your original data pack or disk along with $7.50 for the update. See our BULLETIN BOARD this month for their address.

□□□ A former Coleco electrical lab employee, Philip Kosowsky, is offering a repair service for most standard ADAM components (will not repair disk drives or mechanical parts). He will do this for a flat $50.00 which includes return shipment (he prefers a money order). You may call him after 5pm weekdays or on weekends at (717) 854 - 4647. His address is:

52 Carlisle Avenue
York, PA 17404

□□□ You may have noted that we've listed a few companies in recent issues that are offering the excellent Panasonic 1080i/2 dot matrix printer for around $150. There are three primary reasons for these incredibly low prices for such a versatile printer: (1) approaching Christmas season, (2) lower prices of lazer printers, and (3) the growing popularity of 24 - pin printers. The chances are, though, that the prices may rise again. A few ADAM suppliers offer it with a parallel interface at a bargain price, as well. Some companies still sell this model for over $200. Here is another company offering a very good price on the 1080i/2 ($159 plus actual freight charges):

DIGITAL FRONTIERS
Ms. Christine Kurtz
5410 Newport Drive, Suite 40
Rolling Meadows, IL 60008
in IL: (312) 392 - 1515
toll free: (800) 442 - 4212

□□□ Mr. T. SOFTWARE has just finished another fine programmer's helper. AUTOWRITER is reviewed in this issue. We've also added this utility to our product list.

Mr. T. SOFTWARE also has "TriviaPak" and "Kid's TriviaPak" available on disk; we now stock the disk versions, as well. And until 12/31/87, Mr. T. is offering both game "paks" for only $22.00. We will extend this very special price to our subscribers, too.

□□□ D.L. DECKER ENTERPRISES still has ADAM 5.25" disk drives available, complete with Disk Manager, cable, power supply, manual, and a free disk, for $194.95 + $7 shipping. They also have COLECO disk drive power supplies available for $13.95 + $3 shipping. And, they have expanded into the ATARI ST market. For more information or to order, contact D.L. DECKER ENTERPRISES at the address listed in their ad in this issue.

□□□ Most of us ADAM owners have seen a few bogus operations whose sole purpose (it appears) was to *rip off* as many people as possible. Forced to do most of our shopping by mail, many of us have learned the hard way. Given these circumstances, it is, indeed, regrettable to see legitimate, hard - working ADAM supporters suffer. After a hiatus of a few months, both the Inland Empire ADAM User's Group and the Triangle ADAM Users are mailing their newsletters. Those at the helm of any firm or group need feedback in the form of purchases, renewals, and general help. If you belong to ADAM groups be sure to let them know that you appreciate their services and dedication to our investments in ADAM.

□□□ Michael D. Hilker, of I.E.A.U.G., has added several nice enhancements to our public domain program for SmartPAINT picture viewing, "Pix.MGR". These include a slide - show option for a "pix" volume and an enhanced directory menu for selecting any of the 13 files on a "pix" volume.

□□□ "Family & Home Office Computing" (changed the name from "Family Computing" a few months back) has discontinued their program LISTings for the ADAM computer. This is despite the fact that their own surveys indicate that eight to ten percent of their readership uses the ADAM and that nearly 20% of their income from classified advertising comes from ADAM supporting firms. They still offer limited support through the magazine, however, with occasional articles mentioning the ADAM computer. Also, F.H.O.C. sponsors the Computer Club forum (which supports ADAM) on CompuServe.

□□□ The first ADAM newsletter, "Expandable Computer News" (ECN), has announced intentions to discontinue its bi-monthly publication on a regular basis. They have promised to resolve all outstanding subscriptions at the time that the decision to completely cease publishing is reached. Mr. Sage, the editor, reports that these changes are the result of fewer renewals and the increasing workload on his full - time job.

□□□ By the time you read this, E&T SOFTWARE's new monthly newsletter for ADAM users should be on its way. We'll have a review next month.

□□□ ADAMzap Company, a new ADAM supporter, has three packages out. "PAINTINGS!" is a collection of 15 picture files stored in PaintMASTER format. "SIGNS!" contains 28 different signs for use with SignSHOP.

They've also completed "MicroTalk". This package contains songs, poems, and stories which your ADAM will recite using the Eve Electronics' Speech Synthesizer / Clock - Calendar Unit (SS/CC). It includes nice graphics and a library of over 200 allophone words that you can use in your own programs. We'll have a review of this package in an upcoming issue.

ADAMzap is also working on other programs that combine graphics and speech. The products may be purchased through M.W. Ruth Company.

□□□ ORPHANWARE will hold its annual Christmas give away drawing on December 16th. Two winners will be selected from those who purchased any ORPHANWARE product (direct or from an authorized dealer) between October 1st and December 15th 1987. One winner will receive their 80 column video unit, the other will get an MX - 256 with the parallel interface. The prizes will be shipped on 12/17.

□□□ On December 30th DIGITAL EXPRESS will hold a drawing to select three subscribers as winners of $50.00 purchase credits with DIGITAL EXPRESS. The winners will be notified by mail the following day. The credits may be used at any time during the 1988 calendar year.

THANK YOU

by Solomon Swift

As the year draws to a close, I'm especially reminded of all the ADAM users who have helped to make DIGITAL EXPRESS the success that it is today. Through the past 18 months we've worked hard to try to give our readers what they wanted in articles, newsletter programs, and commercial software. We are, moreover, a reflection of our readers (those who write to me with questions, comments, suggestions, and the like). I'd like to thank all of you who write to me; and when I'm not able to reply immediately, rest assured that I appreciate your magnanimous patience. Also, special thanks go out to all of YOU who have purchased our products (you've made some of our software titles quite popular among ADAM owners) and to all of you for subscribing to N&B and for renewing your subs.

On a typical day, I reply to more than a dozen letters. Many of your letters contain compliments on our organization (many superlative). To those who have sent these uplifting, laudatory missives, I also give thanks.

Nearly every subscriber has made a contribution of some degree. But, a handful have most generously offered help, programs, and services to us. To these especially devoted ADAM users I give a very special thanks. In alphabetical sequence these are:

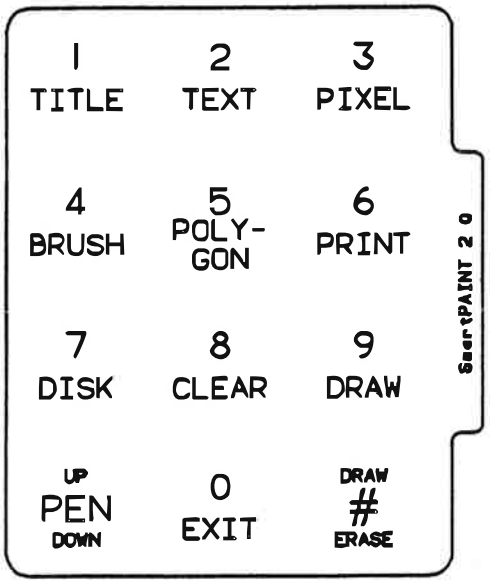
Leonard Adolph
Fernando Alvarez
David G. Carlson
David E. Carmichael
Lewis R. Clancy
Guy Cousineau
D.L. Decker
Doug Glenn
Jim Guenzel
John Fountain
Terry R. Fowler
George Harpster
Pat Herrington
John B. Holder
James M. Killingsworth
Kevin Lindquist
Dave McIntosh
Alan Neeley
Bryan Payton
Jack Reedy
Hector Sanchez
Lee Smith
T.S. Warren
Barry Wilson
Walt Wright
Anthony Yulo

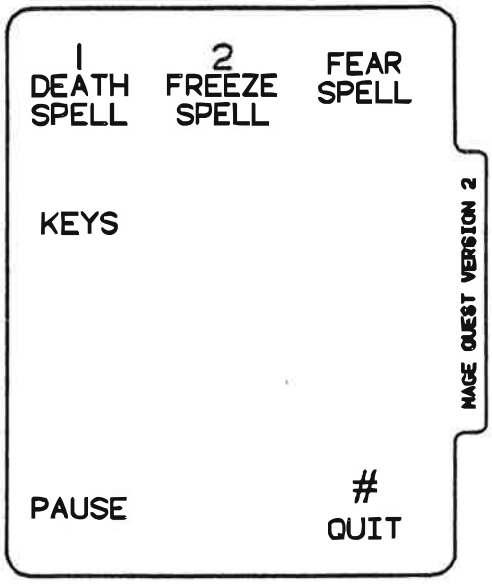
I would also like to thank the dealers who stock our products: D.L. Decker Enterprises, E&T SOFTWARE, MARATHON COMPUTER PRESS, M.W. Ruth Company, Orphanware, and Reedy Software. Also, special thanks go out to our staff, without whom this newsletter would not be possible: Dianne, Tim, Kim, Nancy, Paula, Michael, Chris, and Tony.

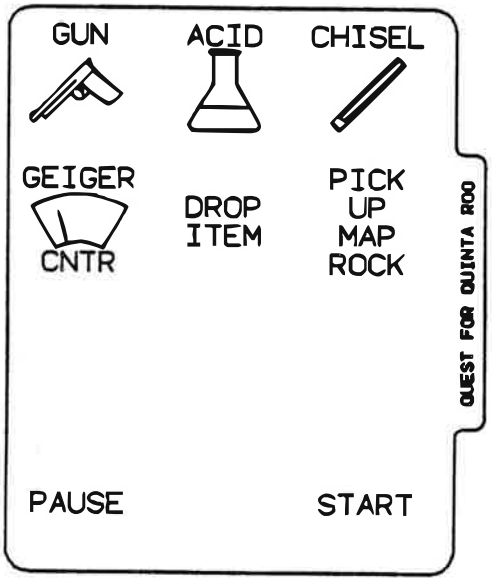
GAME CONTROLLER KEYPAD OVERLAYS

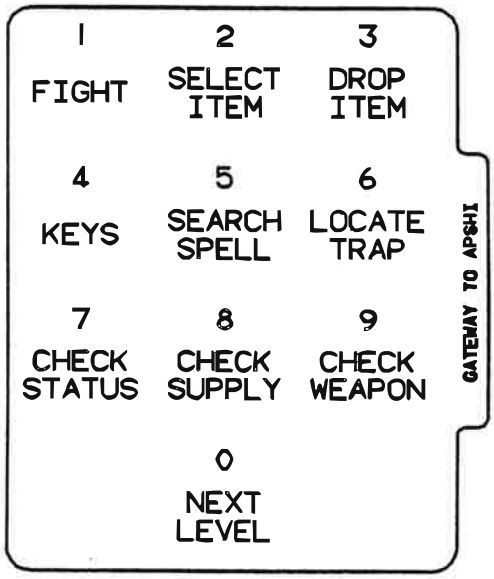
by George Harpster
Cleveland, OH

1. photocopy this page
2. clip overlays from copy
3. place atop the keypad









SHOPPING FOR ADAM

(part 3)

by Patricia J. Herrington

MCP Software has "blankware" tapes which include only one program (of your choice) for a very reasonable price. They also carry the least expensive data packs I've ever seen. I plan to stick with E&T's tapes, however -- I like the look and feel of them, and E&T has a terrific track record. But, MCP offers a lifetime warranty on their tapes, so you may wish to try a few of them for yourself.

Nickelodeon Graphics has been around for quite a while, and they have a good variety of programs for everything from music to speed reading. Some titles are: "ADAM Tips & Tricks", "Typetest", "Graphics Experimenter", "Business Graphics Package". I wish I could tell you more about these programs, but I haven't had the opportunity to check them out.

Reedy Software carries some of my favorites in a new format. I am very fond of the Reedy "Entertainment Pack", which includes "Blockade" (a break - out style game), "Connect - 4" (a strategy game) and "Slide Puzzle" (which is like those plastic sliding puzzles that drove you nuts when your were a kid, trying to get all the numbers in order). All of these games are fun and attractive, making good use of sound and color. They are now available separately (though I'm glad I own the whole set). Reedy also developed "SmartTYPE 2.0", the only word processor for ADAM that allows you to design pages in two - column format and justify each line individually. "Lab Mouse" is an entertaining new game in which you are a mouse trying to find the cheese within a 3 - dimensional maze; its unusual perspective and well done graphics make it addictive (and, if you're looking for a non - aggressive game that will appeal to kids, here it is).

The first text game I ever played was Michigana Jones, from the "Reedy Library" tape. It doesn't have graphics, but I didn't care; I thoroughly enjoyed it ... and so did the various young folks who hang around here. Now you can purchase it separately too; but again, I'm glad I have the complete library, which contains a hi-res text editor and other goodies. Reedy's latest release is a complex and hilarious text adventure by Mike McCauley, entitled "STAGE FRIGHT". Mike is not only a skilled programmer and a creative thinker; but, he's also one of the funniest people I know. This game has everything.

Obviously, I've done a lot of business with Jack Reedy. And, I can promise your that he's a good person to do business with. When I first got my ADAM and needed help in figuring out how to use his software, he was very quick to answer my questions. And, when he updates his software, he offers the new version to his customers for a nominal fee. (And, his prices are now better than ever.)

I'm just beginning to do business with Walters Software; but, I'm already impressed. They are turning out some intriguing stuff. The Walters Brothers have come out with a new RAMdisk program that will work with the 256K memory expander in SmartBASIC, allowing you to use all that super memory as a RAM drive. And, they're working on similar programs for the other large expanders. Walters also has software for creating your own question packs to use with "Family Feud" and "Jeopardy" ... a project that I really want to try ... as well as ready - made question packs for both games. They sell a Double - Disk Formatter and the Media - Aid set of utilities. Also, they recently released LIBRARIAN, which, as I understand it, will read filenames directly from your tapes or disks and put them in a SmartFILER format, allowing you to add your own comments and descriptions (you KNOW that one is on my list!). Walters has other irons in the fire, too; they are working on a new spelling checker, for one thing. And who knows what's next?

If I seem a bit over - awed, I'm not the only one. Computer people just can't believe the amount of third - party support available for Little Orphan ADAM. No other computer seems to be able to grab hold of people's imagination the way ADAM has, or to generate the kind of loyalty you find in ADAMites. The future looks positively sunny!

In fact ... and I meant to mention this in last month's column ... the first ADAM retail store was opened up in Illinois this summer by NIAD, CompuKingdom.

There are, of course, many software retailers I haven't mentioned. I don't have recent catalogs for some of them, and I wanted this information to be as up - to - date as I could manage. I've written some of them and am waiting for replies.

Meanwhile, all the sources listed are currently in business and have good reputations. Most all of them will send you catalogs; but, as I've noted, it can't hurt to send a self - addressed, stamped envelope when you request information. Most of these are fairly small businesses, and are not equipped to handle charge cards. Unless otherwise noted, you can assume that the sources listed will accept checks and money orders. And, naturally, you are likely to receive your order more quickly when you use a money order. Most businesses do not ship COD, although ADAMagic is considering the possibility, especially over the holiday season. As far as I know, all of the businesses listed guarantee their merchandise against defects, and most of them bend over backwards in their effort to be helpful.

OVER THE PHONE LINES

by David E. Carmichael

This month my article is a user's review of one of the many locally operated ADAM support ELECTRONIC BULLETIN BOARD SYSTEMS. This system is ran by the local ADAM users group ADAM-LINK OF UTAH.

Salt Lake City ADAMLINK BBS
(801) 484-5114
C-NET ADAM VERSION 3.1A

OPERATING FROM:
7pm to 7am Mountain time, Monday thru Friday, 24 hours on weekends and on holidays

If you're using the ADAMlink software, your modem PARAMETERS should be at the DEFAULT SETTINGS. If using other modem software, set your modem as follows:

FULL DUPLEX, 7 DATA BITS, 1 STOP BIT,
EVEN PARITY, AUTO-LINE FEED OFF

The following is a list of the system's MAIN commands:

UD,UDx	download subsystem
B,Bx	public message subsystem
M	private mail subsystem
G,Gx	general bulletin files
P,Px	program files (special)
SM	system maintenance subsystem
E	terminal parameters editor
PW	change your PASSWORD
W	the electronic wall
BBS	local BBS listings
ADAM	ADAM BBS listings

Bulletin board command level:

P	post a public bulletin
Rx	read specific message x
S	scan message headers
Kx	kill specific message x
K	kill messages
L	list available boards
M	feedback to SubOp
V	view SubOp
x	change to specfic base x
<,>	forward/back one board

Commands available from any level:

F	feedback to system operator
O	logoff system
+	fast logoff
C	chat with system operator
U	re-read system rules
I	sytem configurations
Q	quit from subsystem
TD	local time/date information
ST	your current call status

The system has a number of message bases where different topics are covered. Even though I have listed most of the OPEN ACCESS areas of this BBS, you will only be given access to one or two of the message bases until you are given higher access.

Sub-Boards:
1. General Area
2. SPORTS
3. Hooter's Place
4. GAMES AND JOKES
5. Hackers Delight
6. ADAM-LINK of Utah

I find it very enjoyable to call this local BBS. The users are willing to help. To top this off, this bulletin board system is FULLY ran on the ADAM in SmartBASIC / EOS!!

But, I find that the program the BBS is running from needs two minor changes / updates. (1) The adding of commands that will let users read only NEW messages left since the last time the user called. (I understand that Alan Neeley, this system's head sysop, is already working on adding this feature.) (2) Adding XMODEM protocol to the file transfer sub-programs.

If you live in the west, be sure to give this ADAM support BBS a call!

Now on to another topic. As I type this (Mid-November), I am watching the FCC / TELECOMMUNICATION HEARINGS on C-SPAN (the CONGRESS SATELLITE SYSTEM) on my local cable system and it does not look good for us users of PACKET SWITCHING DATA COMMUNICATION BASES, *eg*, CIS, PLink, TELENET, ect. systems. It looks like the rates will be going up! I will try my best to keep my fellow ADAM TELECOMMUNICATION users posted as to what is going on.

EXPLORING CP/M 2.2

by Guy Cousineau

The Direct Memory Access (DMA) is used by CP/M to store the record being written to a file or the record being received from it. In addition, it is used by the CCP to store the command tail (the parameters supplied by your input).

When the CCP processes a command, the first "word" is treated as the command, and the second as file number one which it places in FCB1 (at 5CH), and the third word is placed in FCB2 (at 6CH). In addition, the entire command tail (after the first word) is placed in the DMA at 80H preceded by a length byte and a space. For example, if I type:

SAVE 1 a.a

The DMA will contain the following:

```
80 81 82 83 84 85 86 87 adr
06 20 31 20 41 2E 41 00 hex
   sp 1  sp A  .  A     ascii
```

Note that lower case letters have been converted to upper case by the CCP. The first byte tells me that the command tail is six bytes long, and it is always terminated with a null. If you are trying to interpret a filename from the second or third "word", use the FCB's since they will have been parsed for you. If you want to read a command parameter, it is often easier to use the DMA; and it is necessary if that parameter is beyond the third word. You can either employ the length used as a counter, or check for a null which determines the end of the line.

Whatever information is in the DMA, you must extract and use it before issuing a read or write command since it will be overwritten. Alternately, you can change the DMA immediately at the beginning of your program so you can refer back to the command parameters, or use the default DMA for other storage.

Changing the address of the DMA is done with BDOS function 26. Load the DE pair with the address to use, and BDOS does the rest. The new DMA address is maintained until you change it again, do a disk reset, return to the CCP, or do a warm boot.

If you want to move a data file to RAM via open and read, you must reset the DMA before each read operation. Suppose you have reserved all space above 1000H for your data. The following code could be part of your read sequence after the file is opened:

```
LD   DE, 1000H
LD   C,  26      ;"MORE" label
PUSH DE          ;save it
CALL 5           ;do it
CALL READ        ;read one more record
POP  DE          ;old DMA
LD   HL, 80H     ;128 bytes
ADD  HL, DE      ;new DMA in HL
EX   DE, HL      ;new DMA in DE
JR   MORE        ;again
```

It starts by setting the DMA to 1000H, CALLs your read function which reads in one record and presumably checks for errors or end of files, increases the DMA by one record, and continues. Note that once the DMA is set, there is no function to tell you where the DMA is. It the programmer's responsability to remember.

In the next installment, we'll discuss specific procedures to follow when opening and closing files.

Guy Cousineau
1059 Hindley Avenue
Ottawa, CANADA K2B 5L9

CHOOSING ADAM PERIPHERALS

by Solomon Swift

This is a continuation of the article that I started last month.

Do you need a disk drive? There three good reasons for getting a disk drive. One is that disk drives are much faster than the tape drives. Another is that diskettes are considerably less expensive than data packs. The third is that diskettes are generally more reliable than data packs. A possible fourth is that some companies offer a small savings with commercial software on disk.

On the other hand, there are a couple of disadvantages. Disk drives usually cost $200 or more; for a conservative computer budget this could mean putting off a second printer or a 256K expander purchase. Another problem is that disk drives generally require much more care than tape drives. Disk drives typically require repair more frequently than tape drives, as well.

If the $200 is within your computer budget, by all means you should consider upgrading your system with a disk drive. Otherwise, you might be better off to get some of the other interesting peripherals that ADAM owners have access to. American Design Components and D.L. Decker Enterprises both have standard Coleco disk drives in stock. Also, NIAD and ORPHANWARE sometimes have disk drives at very good prices. Additionally, In House Service Reps has manufactured an ADAM compatible disk drive. ORPHANWARE and EVE Electronics offer double - sided upgrades for Coleco disk drives (from 160K to 320K for a little more than $100). In the near future, ORPHANWARE will be offering 3.5", 720K upgrades for about $165.

Last month, I mentioned that a parallel interface should be one of the first additions to your ADAM. The reason is the abundance of supportive software coming out for second printers. Sure, the ADAM SmartWRITER works; but, a dot matrix printer will take you into a new dimension of computing. Printing graphics screens and designing attractive documents can add a *very impressive* touch to your work.

For reasons which I've explained in previous issues, I strongly recommend the Panasonic 1080i/2 impact dot matrix printer. Also, make certain that the parallel interface that you get accesses port 64 ($40) as the EVE Electronics' and ORPHANWARE units do -- this is a standard for ADAM. Of course, other ports may be used; but there is no good reason to create incompatibility with all the existing software (and the projects underway).

UPCOMING DIGITAL EXPRESS SOFTWARE

For quite some time, we've been releasing one new commercial title about every 4 to 6 weeks. This year we introduced our *second generation* of ADAM software. Some of the standard features are: written in machine language, booting with a graphic screen like Coleco's software, using keypress sounds, using SmartKEYs at the bottom of the screen like Coleco software, displaying files on a graphic file folder, and using built - in ramdisks, where applicable.

After officially releasing **PowerPAINT** and **Beyond Trek**, we don't plan to release any new commercial titles for a couple of months; during this interim, we'll be completing **GO-DOS**. This will be a new operating system for ADAM. The set of control routines will reside in the lower end of RAM (about 28K). The user will have the upper 36K for his application programs. We will have routines to use a 64K card as a workspace; this will permit both sophisticated programs and a large workspace. Additionally, the system will check for the size of memory expansion. If more than 64K is found, the excess will automatically be allocated as a ramdisk.

The Operating System will have improved routines for reading from and writing to storage media, using printers, reading the keyboard, etc. It will require at least a 64K card. The majority of the routines are devoted to graphics, and a few to sound.

The sound routines will include a NMI tune option. This will permit music to be played while other activites are in progress. It will also include a version of the SmartTUNES routine.

GO-DOS will permit use of the "desktop metaphor" or SmartKEY labels. With the "desktop metaphor" option, a programmer may use dialog boxes, pull - down menus, icons, etc.

An online clock / calendar will also be included. Here, there will be two installation options: access the EVE SS/CC or employ an NMI driven clock (which will have to be set each time the system is booted). As other clock / calendar peripherals become popular, we'll release patches. The system will even include a graphic calculator.

All in all, the system will present many of the features available on today's 256K+ machines with graphic operating systems. However, this Operating System will be designed exclusively and distinctly for ADAM.

Along with GO-DOS, we'll include a utility program demonstrating the system's features. We will also include technical information for those who are interested in programming in this powerful environment. After you see how easy it will be to program in machine language, you may want to put BASIC aside.

After this initial release, we'll start writing commercial software at the prolific rate that many ADAM owners have come to expect from us. A lareg portion of these programs will be designed specifically for use with GO-DOS -- this will be our *third generation* of software for the ADAM.

BYTE-SIZED BASIC

HI-RES SHAPES

(part 5)

Last month we discussed using the HCOLOR and SCALE commands. You must use each of these commands after every HGR or HGR2 command. For some unknown reason, each of these graphic commands resets those two values. To determine the current HCOLOR value, PEEK (16777). This value will be in standard VDP color code -- not SmartBASIC's unnecessary HCOLOR code. To determine the current SCALE value, PEEK (16765). You can also change these values simply POKEing a new parameter into the corresponding address.

The ROT command is used to rotate the shapes. The acceptable parameter range is "0" thru "63", with increasing values resulting in a clockwise rotation. At small SCALE values, most of the rotation values don't generate any change. Keep in mind the axis of rotation is the first point plotted.

After selecting HCOLOR, SCALE, ROT, setting up the shape table, and POKEing the table pointers (addresses 16766 and 16777), you can put the shapes on the graphics screen. The command for this is DRAW. The syntax is:

DRAW shape# AT horizontal, vertical

The shape number may a value from "0" thru "255". However, the actual parameter range is determined by your shape table. If you only have 10 shapes, for example, you can not draw shape number 11.

The horizontal and vertical coordinate ranges are the same as for HPLOTting. The x-axis may vary from "0" thru "255". And, the y-axis may vary from "0" thru "191".

The XDRAW command has the same syntax as DRAW; XDRAW erases the specified shape. This is different from the AppleSoft XDRAW command which compliments the existing color rather than erasing the shape. You can create simple animation with a shape by DRAWing it at a position, then XDRAWing it at the same positon, and completing by DRAWing it a new position (a few pixels away).

HACKER'S DELIGHT

SPECIAL NOTE

With this being our holiday issue and a particular concentration on ADAM's music abilities, we've changed our standard format to some degree. Most notably, the HACKER'S DELIGHT department has been shortened this month. Next issue, we'll get back to studying the EOS and Z80 op codes.

QuikDISK TIP

Last month we LISTed two useful utilites for setting up a ramdisk with your favorite programs. PACK saves the entire ramdisk to disk or data pack (as a single file). UNPACK retrieves it. This way, you only have to install one program when you turn your system on.

You can use these programs with our QuikDISK ramdisk for standard RAM, as well. However, there is a much more simple technique. First remember the block size that you selected for your ramdisk, and then multiply that number times 1024 to obtain a byte length value. To store the QuikDISK ramdisk, just enter:

BSAVE filename, A27648, L????

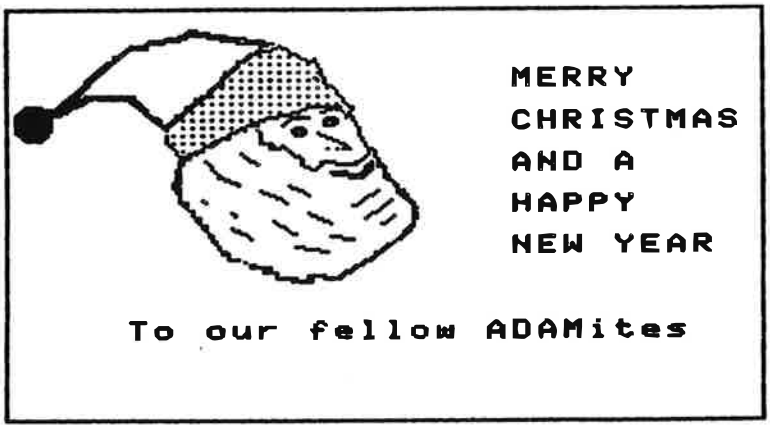
When you want to retrieve it, just enter "BLOAD filename". Be sure that QuikDISK is in effect first, though.

New SmartBASIC 2.0 BOOTSTRAP

In our November 1986 issue we LISTed a new bootstrap routine for SmartBASIC 1.0. The block zero rewrite displayed a TEXT screen while the interpreter loaded into RAM. And, it corrected the default drive to whatever drive BASIC was booted from.

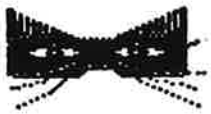
This month (on the next page), we have a similar program contributed by one of our subscribers, ADAM hacker Thomas S. Warren. Mr. Warren has deftly combined our SB 1.0 bootstrap with the default SB 2.0 bootstrap. The result is a TEXT screen with your message displayed as SmartBASIC 2.0 loads into memory. Be sure to use your first draft only on a backup copy of SB 2.0. The program works, but even one typo could lockup the system.

```
  1 REM new bootstrap for SmartBASIC 2.0 (STDMEM)
  2 REM diplays TEXT messages while loading BASIC
  3 REM by Thomas S. Warren
  4 REM Springfield, OH
  5 REM based on "SB1.0boot" by DIGITAL EXPRESS
  6 REM November, 1986 issue of Nibbles & Bits
 100 LOMEM :30000
 110 DATA 62,4,17,0,0,1,0,0,33,0,108,205,246,252,201
 120 FOR x = 27600 TO 27614: READ b: POKE x, b: NEXT
 300 TEXT: PRINT " New BASIC 2 BootStrap!!": PRINT
 305 INPUT "Catalog Name (Max 12): "; w$
 310 x = LEN(w$): IF x > 12 OR x < 1 THEN 305
 312 IF x/2 <> INT(x/2) THEN  w$ = w$+" "
 315 FOR n = 1 TO INT((14-x)/2): w$ = " "+w$+" ": NEXT
 320 PRINT: PRINT " one moment please..."
 500 FOR x = 0 TO 1023: POKE 27648+x, 0: NEXT
4999 REM main program
5000 DATA 49,254,203,120,50,255,255,1,0,0,205,32,253,1,224,1,205,32,253
5030 DATA 33,0,0,62,3,205,41,253,33,0,8,62,2,205,41,253
5050 DATA 205,56,253,17,0,4,33,0,0,1,128,0,205,23,253,33,0,11,62,4,205,41,253
5070 DATA 62,25,17,16,0,33,0,11,205,38,253,62,244,17,16,0,33,16,11,205,38,253
5090 DATA 62,32,17,0,3,33,0,8,205,38,253,1,6,7,205,32,253
5110 DATA 17,40,8,33,0,203,1,14,0,205,26,253
5120 DATA 17,104,8,33,14,203,1,15,0,205,26,253
5130 DATA 17,168,8,33,29,203,1,14,0,205,26,253
5160 DATA 17,38,10,33,43,203,1,20,0,205,26,253
5300 DATA 6,20,62,128,211,224,120,211,224,62,146,211,224
5310 DATA 17,0,10,27,122,179,32,251,5,16,234,62,159,211,224
5500 DATA 58,255,255,79,62,2,211,127,33,102,0,17,0,2,6,8,126,47,119,190,32,13
5510 DATA 47,119,190,32,8,25,16,242,62,255,50,11,201,62,1,211,127,121,6,1
5520 DATA 33,1,201,205,192,252,194,0,202,245,1,39,130,33,0,0,205,210,252,193
5530 DATA 32,13,120,205,195,252,58,11,201,50,150,65,195,0,1,120
5540 DATA 205,195,252,195,0,202,66,65,83,73,67,80,71,77,2,3,255
6000 FOR x = 27648 TO 27915: READ d: POKE x, d: NEXT
10000 REM error routine
10010 DATA 62,226,211,224,62,240,211,224
10020 DATA 17,0,200,27,122,179,32,251
10030 DATA 17,0,200,27,122,179,32,251,62,255,211,224
10040 DATA 62,32,17,0,3,33,0,8,205,38,253
10050 DATA 17,39,8,33,63,203,1,17,0,205,26,253
10070 DATA 17,132,8,33,80,203,1,9,0,205,26,253
10080 DATA 17,196,8,33,89,203,1,17,0,205,26,253
10090 DATA 24,20,62,226,211,224,62,240,211,224
10100 DATA 17,0,100,27,122,179,32,251,62,255,211,224
10110 DATA 205,108,252,48,251
10120 DATA 254,49,32,3,195,48,252,254,50,32,220,195,231,252,201
```



SB2.Øboot LIST continued ...

```
11000 FOR x = 28160 TO 28276: READ d: POKE x, d: NEXT
15000 ps = 28416: &   screen strings
15015 n = 128: GOSUB 22000
15020 w$ = "SmartBASIC V2.0": GOSUB 22000: w$ = "32 Column Text": GOSUB 22000
15070 w$ = "one moment please...": GOSUB 22000
15090 w$ = " FILE LOAD ERROR ": n = 128: GOSUB 22000
15110 w$ = "1. Reboot": GOSUB 22000
15120 w$ = "2. Word Processor": GOSUB 22000
20000 HOME: PRINT: HTAB 2: PRINT "Use ONLY on a BASIC backup!!": PRINT
20030 PRINT " 1 = disk one": PRINT " 2 = tape one"
20040 PRINT: PRINT " any other numeric key to abort.."
20050 GET k: IF k < 1 OR k > 2 THEN  TEXT: END
20060 POKE 27601, k*4
21010 PRINT: PRINT: PRINT " press <RETURN> to alter..."
21020 GET k$: IF k$ <> CHR$(13) THEN  END
21030 PRINT: PRINT " one moment please..": CALL 27600: GOTO 20000
22000 FOR x = 1 TO LEN(w$): POKE ps, ASC(MID$(w$, x))+n
22005 ps = ps+1: NEXT: n = Ø: RETURN
```



```
  10 REM simple EVE Electronics SS/CC speech demonstration
  15 REM by DIGITAL EXPRESS
  20 REM presented in "Nibbles & Bits" November, 1987
  50 REM surprise Christmas greeting
 100 LOMEM :30000
 110 DATA 62,000,245,219,75,254,75,32,2,241,201
 120 DATA 62,129,211,75,219,74,203,71,40,250,241
 130 DATA 211,72,246,128,211,73,175,211,73,201
 140 FOR x = 27600 TO 27631: READ mc: POKE x, mc: NEXT
 200 REM the allophones
 210 DATA 16,12,12,39,1,39,19,3
 220 DATA 42,39,12,55,13,1,16,15,55,4,4,4
 230 DATA 26,11,21,3,20,4
 240 DATA 27,26,9,1,9,19,3
 250 DATA 56,22,3
 260 DATA 49,60,4
 499 DATA -1
 500 READ ap: IF ap = -1 GOTO 520
 510 POKE 27601, ap: CALL 27600: GOTO 500
 520 END
```

ADAM: SIGHT & SOUND

VIDEO REGISTERS

(part 3)

Let's continue our discussion of the 82nd vector in the EOS jump table (64803 or $FD23). The routine requires no setup. The result (previous value of VDP register 8) is placed at address 64867 (in the central EOS workspace). The resulting status check is also returned in the accumulator. More on the VDP registers next month.

The MultiColor Mode

As we've mentioned in previous issues, the video chip is capable of four distinct types of display. These are: <1> 32 column text (referred to as graphics mode one), <2> 40 column text (does not permit sprite usage), <3> graphics mode two (used by HGR, HGR2, GR from BASIC and employed by most Coleco software), and <4> multi - color mode. In multi - color mode the screen consists of 64 blocks across by 48 blocks down. Each block is a perfect square (4 x 4 pixels) unlike Coleco's GR implementation.

We had tried unsuccessfully on several occasions to write a working design program for the multi - color mode. Finally, Leonard Adolph (of Flint, MI who has contributed assorted articles and programs to DIGITAL EXPRESS) came to our rescue. He has submitted three multi-color programs. The one that we have LISTed in this issue (next page) is just a simple demonstration of the graphics mode. It allows you to enter the color value and the horizontal and vertical coordinates to plot a block; there is no color bleeding in this mode.

Next month we'll LIST his more sophisticated program, **MultiPIX**, which uses sprites and allows you to draw, save and load pictures!! You can study his routines in this program to see how the mode works. There is no color bleeding because blocks alternate between what would be the foreground and background colors in graphics mode 2.

THE EVE SS/CC

At the bottom of page 13 we have a simple program LISTed that will speak a *surprise* message via the EVE Electronics Speech Synthesizer / Clock Calendar unit. The message allophones are on line numbers 200 thru 260. Most noteworthy of the program is the simple routine to access the speech synthesizer. This 32 byte routine is contained in line numbers 110 thru 130.

The routine is simple to use. Just POKE the allophone address (0 - 63, decimal) into address 27601 and then CALL 27600. The routine checks for the presence of the unit; if it's not connected the routine will abort. Thus, it can not lockup the system. Another feature is that the routine is NOT address specific; it can be stored anywhere in RAM. Just remember to POKE the allophone address into the second byte of the routine and CALL the first byte to process the data.

MUSIC AND THE SOUND CHIP

ADAM's sound chip, the TI-SN76489A, is not as sophisticated as the Commodore SID chip; but, it can produce some very pleasing music. There are basic four challenges to outputting music. You need to know the chip's port address, you need to know the range of output values, you need to have a fundamental understanding the concepts of musical notation (for transcribing from score sheets), and you need to know how to convert music to values that the chip can use.

This month, we'll barely cover the essentials in text. But, we do have several programs and charts. The next page LISTs a program that will print a formatted hardcopy of sound chip to musical note frequency correspondences. The actual harcopy is on pages 17 and 18. As you'll note ADAM is capable of six octaves ranging from the third to the eighth (many of the notes in the eighth octave are shrilled, however). The most pleasant sound is generated using the third, fourth, and fifth octaves. Our chart lists A, A#, and B before "C" in an octave; in truth, however, these notes in a chromatic scale are played above "C". For example: C, D, E, F, G, A, B, C.

With access to three voices, you can create some very interesting simultaneous sounds. But, you'll generally find music more pleasing by using the second and third voices for harmony. More explicitly, you could use the first voice for the score sheet note, use the second voice for the same note of the next higher octave, and use the third voice for the same note in the next lower octave. This is the technique we used in the three SmartTUNES songs LISTed in this issue. The songs sound as good as some of the ones that those new sophisticated, portable keyboards produce.

Since space is very short this month, we'll keep the explanations brief. You must have the SmartTUNES routine in RAM before using the songs. The songs can be SAVEd as DATA statements (as in our LISTs) or BSAVEd as binary files. And, since we've donated this routine into the public domain, you may use these songs or your own creations for personal use or in commercial software (we would appreciate a mention in the software documentation).

The routine allows you to set the tempo, select an octave offset (raise or lower by an octave), set the volume, exit at any point by pressing the <ESCAPE> key, and it automatically converts alphabetic notes to the values used by ADAM's sound chip.

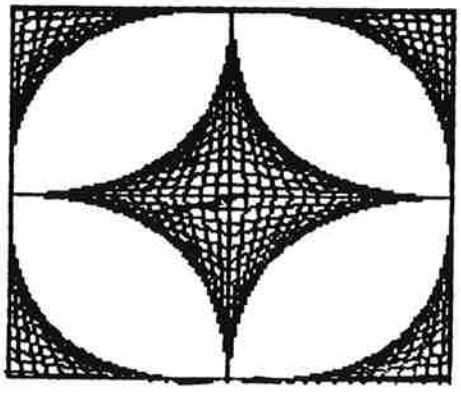
Next month we'll go into a lot more detail on transcribing and composing songs. The format for reading a triple voice note is:

note1 note2 note3 duration

For example, E4E5E34 will play "E" of the 4th octave, "E" of the 5th octave, and "E" of the 3rd octave all at a duration of one - eighth note.

```
  1 REM MultiColor Video Mode demonstration program
  2 REM by Leonard F. Adolph
  3 REM Flint, MI
  5 REM do NOT use with Intel-BEST 3.3 or N&B pr#2/pr#3 patch
  6 REM press <escape> to exit program
  9 REM ml routines are poked into Copywrite message location
 19 REM POKE 1102 , (200 for mc : 192 for gl) : CALL 1100 for mode change
 29 REM POKE 1071 , (col*8): POKE 1072 , (row+32)
 39 REM POKE pattern (8 bytes) into 1056-1063 : CALL 1064 to put to VRAM
 50 POKE 16134, 27
 99 REM clear transfer table space
100 FOR x = 1056 TO 1063: POKE x, 0: NEXT
109 REM transfer table to VRAM pattern table  routine
110 DATA 229,213,197,33,32,4,17,0,0,1,8,0,205,26,253,193,209,225,201
120 FOR x = 1064 TO 1082: READ ml: POKE x, ml: NEXT
129 REM mode change routine
130 DATA 197,1,192,1,205,32,253,193,201
140 FOR x = 1102 TO 1110: READ ml: POKE x, ml: NEXT
149 REM transfer VRAM pattern to table routine
150 DATA 229,213,197,17,0,0,33,32,4,1,8,0,205,29,253,193,209,225,201
160 FOR x = 1083 TO 1101: READ ml: POKE x, ml: NEXT
200 HGR
210 POKE 1104, 192: CALL 1102
300 PRINT " horizont (0-63): ";
310 INPUT c
320 IF c < 0 OR c > 63 GOTO 300
330 PRINT " vertical (0-39): ";
340 INPUT r
350 IF r < 0 OR r > 47 GOTO 330
360 PRINT "    color (0-15): ";
370 INPUT t
380 IF t < 0 OR t > 15 GOTO 360
399 REM convert column & row to VRAM address
400 POKE 1071, INT(c/2)*8
410 POKE 1072, INT(r/2)+32
419 REM convert data for VRAM use
420 IF c/2 = INT(c/2) THEN  t = t*16
430 o = r-(INT(r/8)*8)
479 REM read VRAM to table
480 POKE 1087, INT(c/2)*8
490 POKE 1088, INT(r/2)+32
500 CALL 1083
509 REM peek into table & add new color & block
510 m = PEEK(1056+o)
520 IF c/2 = INT(c/2) THEN 540
530 m = INT(m/16)*16: GOTO 550
540 m = m-INT(m/16)*16
550 t = t+m
560 POKE 1056+o, t
599 REM look at MC screen
600 POKE 1104, 200: CALL 1102
610 CALL 1064
620 GET a$
639 REM reset and get more
640 o = 0
730 GOTO 210
```

```
 10 REM musical note chart for ADAM
110 DIM nt$(12)
200 DATA A,A#,B,C,C#,D,D#,E,F,F#,G,G#
210 FOR x = 1 TO 12: READ nt$(x): NEXT
220 ff = 110: sf = 1.05946309: mh = 3597545
230 FOR x = 1 TO 6: sp$ = sp$+CHR$(32): NEXT
300 DATA 245,219,64,203,71,40,250,241,211,64,201
310 DATA 205,11,47,205,78,4,254,13,192,62,10,24,2,62,0,195,78,4
320 FOR x = 0 TO 28: READ mc: POKE x+1102, mc: NEXT
330 POKE 16217, 89: POKE 16218, 4: POKE 16219, 92: POKE 16220, 4
400 TEXT: INVERSE: PRINT " MUSICAL NOTE CHART ": NORMAL
410 PRINT: PRINT " 1 = print chart": PRINT " 2 = exit program"
420 GET k$: ON k$ = "1" GOTO 500
430 TEXT: PRINT " end of program.": END
500 HOME: PRINT " 1 = ADAM printer": PRINT " 2 = dot matrix"
510 GET k$: k% = VAL(k$): IF k% < 1 OR k% > 2 GOTO 430
600 PR #k%: q$ = "MUSICAL NOTE CHART FOR ADAM"
610 PRINT: PRINT SPC(40-LEN(q$)/2); q$;
612 FOR x = 1 TO LEN(q$): PRINT CHR$(8); : NEXT
614 FOR x = 1 TO LEN(q$): PRINT CHR$(95); : NEXT: PRINT: PRINT: PRINT
620 q2$ = "OCTAVE  NOTE  FREQUENCY  10bit#  BYTE#1  BYTE#2  "
625 q2$ = q2$+"V1/B1  V2/B1  V3/B1"
630 PRINT sp$; q2$: PRINT
700 FOR oc = 0 TO 3: FOR nt = 1 TO 12
710 GOSUB 900: NEXT: PRINT: NEXT: PR #0
720 HOME: PRINT " insert 2nd page,"
730 PRINT " press <return> to print..."
740 GET k$: ON k$ <> CHR$(13) GOTO 430: PR #k%
750 q3$ = "- page 2 -": PRINT SPC(40-LEN(q3$)/2); q3$: PRINT
755 PRINT: PRINT sp$; q2$: PRINT
760 FOR oc = 4 TO 5: FOR nt = 1 TO 12: GOSUB 900: NEXT: PRINT
770 NEXT: PR #0: GOTO 430
900 PRINT sp$; SPC(2); oc+3; SPC(6); nt$(nt); SPC(6-LEN(nt$(nt)));
910 IF nt = 1 THEN  fq = (2^oc)*110: GOTO 930
920 fq = fq*sf: fq = (fq*1000+.5)/1000
930 fq$ = STR$(fq): IF fq < 1000 THEN  fq$ = " "+fq$
935 IF LEN(fq$) > 7 THEN  fq$ = LEFT$(fq$, 7)
936 IF RIGHT$(fq$, 2) = "00" THEN  fq$ = LEFT$(fq$, 4)
940 PRINT fq$; SPC(11-LEN(fq$));
950 tb = mh/(32*fq): sb% = tb/16: fb% = tb-16*sb%
960 fb$ = STR$(fb%): IF fb% < 10 THEN  fb$ = " "+fb$
970 sb$ = STR$(sb%): IF sb% < 10 THEN  sb$ = " "+sb$
975 tb$ = STR$(INT(tb)): IF tb < 1000 THEN  tb$ = " "+tb$
976 IF tb < 100 THEN  tb$ = " "+tb$
977 IF tb < 10 THEN  tb$ = " "+tb$
980 PRINT tb$; SPC(5); fb$; SPC(6); sb$; SPC(5);
990 PRINT fb%+128; SPC(4); fb%+160; SPC(4); fb%+192: RETURN
```



MUSICAL NOTE CHART FOR ADAM

OCTAVE	NOTE	FREQUENCY	10bit#	BYTE#1	BYTE#2	V1/B1	V2/B1	V3/B1
3	A	110	1022	14	63	142	174	206
3	A#	116.54	964	4	60	132	164	196
3	B	123.47	910	14	56	142	174	206
3	C	130.81	859	11	53	139	171	203
3	C#	138.59	811	11	50	139	171	203
3	D	146.83	765	13	47	141	173	205
3	D#	155.56	722	2	45	130	162	194
3	E	164.81	682	10	42	138	170	202
3	F	174.61	643	3	40	131	163	195
3	F#	185	607	15	37	143	175	207
3	G	196	573	13	35	141	173	205
3	G#	207.65	541	13	33	141	173	205
4	A	220	511	15	31	143	175	207
4	A#	233.08	482	2	30	130	162	194
4	B	246.94	455	7	28	135	167	199
4	C	261.62	429	13	26	141	173	205
4	C#	277.18	405	5	25	133	165	197
4	D	293.66	382	14	23	142	174	206
4	D#	311.13	361	9	22	137	169	201
4	E	329.63	341	5	21	133	165	197
4	F	349.23	321	1	20	129	161	193
4	F#	370	303	15	18	143	175	207
4	G	392	286	14	17	142	174	206
4	G#	415.31	270	14	16	142	174	206
5	A	440	255	15	15	143	175	207
5	A#	466.16	241	1	15	129	161	193
5	B	493.88	227	3	14	131	163	195
5	C	523.25	214	6	13	134	166	198
5	C#	554.36	202	10	12	138	170	202
5	D	587.33	191	15	11	143	175	207
5	D#	622.25	180	4	11	132	164	196
5	E	659.25	170	10	10	138	170	202
5	F	698.46	160	0	10	128	160	192
5	F#	739.99	151	7	9	135	167	199
5	G	783.99	143	15	8	143	175	207
5	G#	830.61	135	7	8	135	167	199
6	A	880	127	15	7	143	175	207
6	A#	932.32	120	8	7	136	168	200
6	B	987.76	113	1	7	129	161	193
6	C	1046.50	107	11	6	139	171	203
6	C#	1108.73	101	5	6	133	165	197
6	D	1174.66	95	15	5	143	175	207
6	D#	1244.51	90	10	5	138	170	202
6	E	1318.51	85	5	5	133	165	197
6	F	1396.91	80	0	5	128	160	192
6	F#	1479.98	75	11	4	139	171	203
6	G	1567.98	71	7	4	135	167	199
6	G#	1661.22	67	3	4	131	163	195

OCTAVE	NOTE	FREQUENCY	10bit#	BYTE#1	BYTE#2	V1/B1	V2/B1	V3/B1
7	A	1760	63	15	3	143	175	207
7	A#	1864.65	60	12	3	140	172	204
7	B	1975.53	56	8	3	136	168	200
7	C	2093	53	5	3	133	165	197
7	C#	2217.46	50	2	3	130	162	194
7	D	2349.32	47	15	2	143	175	207
7	D#	2489.01	45	13	2	141	173	205
7	E	2637.02	42	10	2	138	170	202
7	F	2793.83	40	8	2	136	168	200
7	F#	2959.96	37	5	2	133	165	197
7	G	3135.96	35	3	2	131	163	195
7	G#	3322.44	33	1	2	129	161	193
8	A	3520	31	15	1	143	175	207
8	A#	3729.31	30	14	1	142	174	206
8	B	3951.06	28	12	1	140	172	204
8	C	4186.01	26	10	1	138	170	202
8	C#	4434.92	25	9	1	137	169	201
8	D	4698.63	23	7	1	135	167	199
8	D#	4978.03	22	6	1	134	166	198
8	E	5274.04	21	5	1	133	165	197
8	F	5587.65	20	4	1	132	164	196
8	F#	5919.91	18	2	1	130	162	194
8	G	6271.93	17	1	1	129	161	193
8	G#	6644.88	16	0	1	128	160	192

MUSICAL INFO

GENERAL FACTS

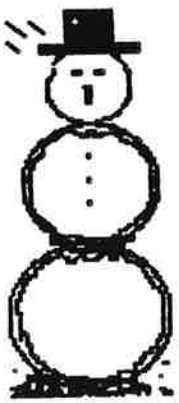
* SOUND CHIP MODEL NUMBER: SN76489A (by Texas Instruments)
* SOUND CHIP FREQUENCY: 3597545 mhertz
* FREQUENCY OF "A" ABOVE MIDDLE "C": 440/sec
* CHROMATIC SCALE FREQUENCY VARIATION (SEMITONE VARIANCE): 2 to the $^{1}/_{12}$ power or 1.05946309
* Z80 ACCESS PORT: 240 (#F0); OUT only; any port 224-255 may be utilized for output
* FREQUENCY CONVERSION: 10 bit value = mhertz / (32 * frequency)
* 2nd BYTE TO SOUND CHIP = 10 bit value / 16
* 1st BYTE TO SOUND CHIP (OFFSET) = 10 bit value - (2nd byte * 16)
* VOLUME: value (0-15) + offset (for particular voice); 0=loud & 15=off

OFFSETS

	FIRST BYTE	VOLUME
voice1	128	144
voice2	160	176
voice3	192	208

RANGES

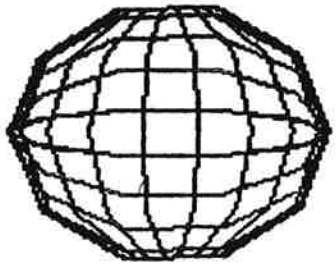
	FIRST BYTE	SECOND BYTE	VOLUME
voice1	128-143	0-63	144-159
voice2	160-175	0-63	176-191
voice3	192-207	0-63	208-223

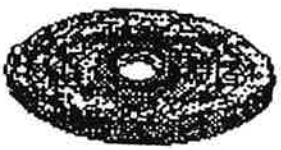


```
 10 REM SmartTUNES player routine
100 LOMEM :32000: TEXT: PRINT " one moment ..."
105 REM set up note table
110 ff = 110: sf = 1.05946309: mh = 3597545: st = 27648
120 FOR oc = 0 TO 5: FOR nt = 1 TO 12
130 IF nt = 1 THEN  fq = (2^oc)*110: GOTO 150
140 fq = fq*sf: fq = (fq*1000+.5)/1000
150 tb = mh/(32*fq): sb% = tb/16: fb% = tb-16*sb%
160 POKE st, fb%: POKE st+1, sb%: st = st+2: NEXT: NEXT
300 DATA 229,213,197,245,42,146,108,126
305 DATA 245,175,50,148,108,241,254,87,32,17
310 DATA 62,159,211,224,198,32,211,224,198,32,211,224
320 DATA 241,193,209,225,201
330 DATA 254,88,32,7,62,159,205,207,109,195,94,109
340 DATA 254,89,32,7,62,191,205,207,109,195,94,109
350 DATA 254,90,32,7,62,223,205,207,109,195,144,109
360 DATA 254,65,32,2,14,0,254,97,32,2,14,1,254,66,32,2,14,2
370 DATA 254,67,32,2,14,3,254,99,32,2,14,4,254,68,32,2,14,5
380 DATA 254,100,32,2,14,6,254,69,32,2,14,7,254,70,32,2,14,8
390 DATA 254,102,32,2,14,9,254,71,32,2,14,10,254,103,32,2,14,11
400 DATA 35,126,214,2,71,229,33,232,107,17,24,0,25,16,253
410 DATA 121,135,95,22,0,25,0,0,0,58,148,108,254,0,32,29
420 DATA 126,6,128,128,211,240,35,126,211,240,58,145,108
430 DATA 71,62,159,144,211,240,33,148,108,52,225,35,126,195,166,108
440 DATA 254,1,32,21
450 DATA 126,6,160,128,211,240,35,126,211,240,58,145,108
460 DATA 71,62,191,144,211,240,24,221
470 DATA 126,6,192,128,211,240,35,126,211,240,58,145,108
480 DATA 71,62,223,144,211,240,225,175,50,148,108,35,126
485 DATA 254,33,48,4,254,0,32,6,34,149,108,195,170,108,71
490 DATA 237,91,143,108,30,0,19,122,179,32,251
492 DATA 245,197,205,168,252,56,12,58,117,253,254,27,32,8
494 DATA 193,241,34,149,108,195,170,108,193,241,16,219
496 DATA 35,126,195,166,108
498 DATA 213,245,58,145,108,71,241,79,121,144,211,240
499 DATA 17,12,0,27,122,179,32,251,16,242,209,201,-1
500 be = 27800: tt = 0
510 READ mc: IF mc = -1 GOTO 530
520 POKE be, mc: be = be+1: tt = tt+mc: GOTO 510
530 IF be = 28135 AND tt = 38506 GOTO 600
540 PRINT: PRINT " data entry error!!": END
600 PRINT: PRINT " SmartTUNES routine in RAM.": PRINT
610 PRINT " Now, just RUN a TUNE module."
```

DURATION FORM OF MUSIC NOTES	
o	= whole note
𝅗𝅥	= half note
♩	= quarter note
♪	= eighth note
𝅘𝅥𝅯	= sixteenth note
𝅘𝅥𝅰	= thirty-second
𝅘𝅥𝅱	= sixty-fourth

```
 100 LOMEM :32000: be = 29000
 110 PRINT " one moment please ...": PRINT
1000 REM "The First Noel"
1010 REM must load SmartTUNES player routine first
1020 DATA E4E5E34,D4D5D34,C4C5C316
1025 DATA D4D5D34,E4E5E34,F4F5F34
1030 DATA G4G5G324,A5A6A44,B5B6B44
1035 DATA C5C6C48,B5B6B44,A5A6A48
1040 DATA G4G5G324,A5A6A46,B5B6B44
1045 DATA C5C6C48,B5B6B48,A5A6A48
1050 DATA G4G5G38,A5A6A48,B5B6B48
1055 DATA C5C6C48,G4G5G38,F4F5F38
1060 DATA E4E5E324,XYZ4,E4E5E34
1065 DATA D4D5D34,C4C5C316,D4D5D34
1070 DATA E4E5E34,F4F5F34,G4G5G324
1075 DATA A5A6A44,B5B6B44,C5C6C48
1080 DATA B5B6B44,A5A6A48,G4G5G324
1085 DATA A5A6A44,B5B6B44,C5C6C48
1090 DATA B5B6B48,A5A6A48,G4G5G38
1095 DATA A5A6A48,B5B6B48,C5C6C48
1100 DATA G4G5G38,F4F5F38,E4E5E324
1105 DATA XYZ4,E4E5E34,D4D5D34
1110 DATA C4C5C316,D4D5D34,E4E5E34
1115 DATA F4F5F34,G4G5G324,C5C6C44
1120 DATA B5B6B44,A5A6A424,XYZ1
1125 DATA A5A6A48,G4G5G332,C5C6C44
1130 DATA B5B6B44,A5A6A424,XYZ1
1135 DATA A5A6A48,G4G5G332,C5C6C48
1140 DATA B5B6B48,A5A6A48,G4G5G38
1145 DATA A5A6A48,B5B6B48,C5C6C48
1150 DATA G4G5G38,F4F5F38,E4E5E332
2599 DATA W
2900 READ nt$: IF nt$ = "W" THEN  GOSUB 3000: GOTO 4000
2910 GOSUB 3000: GOTO 2900
3000 FOR x = 1 TO LEN(nt$): ak = ASC(MID$(nt$, x, 1))
3010 IF ak > 64 THEN  POKE be, ak: GOTO 3100
3015 pk = PEEK(be-1): IF pk = 88 OR pk = 89 OR pk = 90 GOTO 3030
3020 IF PEEK(be-1) > 64 GOTO 3200
3030 IF x = LEN(nt$) GOTO 3200
3040 a1 = VAL(MID$(nt$, x, 1)): a2 = VAL(RIGHT$(nt$, 1))
3050 POKE be, a1*10+a2: x = x+1: GOTO 3100
3100 be = be+1: NEXT x: RETURN
3200 POKE be, VAL(MID$(nt$, x, 1)): GOTO 3100
4000 tempo = 235: volume = 15: pointer = 29000: offset = 2
4010 POKE 27946, offset: REM (39,109)
4020 POKE 27792, tempo: REM (144,108)
4030 POKE 27793, volume: REM (145,108)
4040 POKE 27795, pointer/256: REM (147,108)
4050 POKE 27794, pointer-PEEK(27795)*256: REM (146,108)
4100 IF PEEK(27800) <> 229 GOTO 4200
4110 IF PEEK(28000) <> 195 GOTO 4200
4120 IF PEEK(28110) <> 108 GOTO 4200
4130 GOTO 5000
4200 PRINT: PRINT " ERROR!!!  SmartTUNES"
4210 PRINT " routine not detected.": END
5000 CALL 27800: END
```

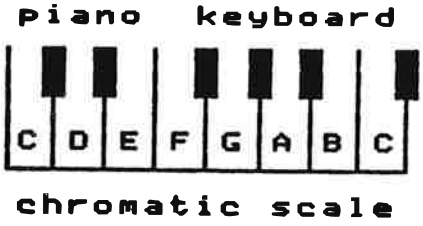


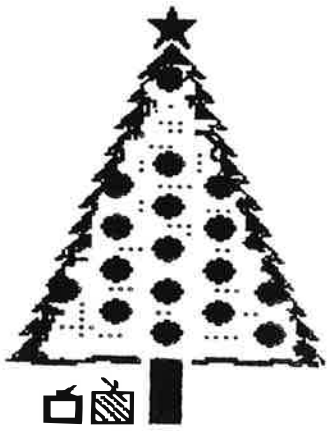


```
 100 LOMEM :32000: be = 29000
 110 PRINT " one moment please ...": PRINT
1000 REM "O' Come All Ye Faithful"
1010 REM must load SmartTUNES player routine first
1020 DATA F5F6F48,XYZ1,F5F6F416
1025 DATA C5C6C48,F5F6F48,G5G6G416
1030 DATA C5C6C416,A6A7A58,G5G6G48
1035 DATA A6A7A58,a6a7a58,A6A7A516
1040 DATA G5G6G48,F5F6F48,XYZ1
1045 DATA F5F6F416,E5E6E48,D5D6D48
1050 DATA E5E6E48,F5F6F48,G5G6G48
1055 DATA A6A7A58,E5E6E416,D5D6D412
1060 DATA C5C6C44,XYZ1,C5C6C424
1065 DATA C6C7C516,a6a7a58,A6A7A58
1070 DATA a6a7a516,A6A7A516,G5G6G48
1075 DATA A6A7A58,F5F6F48,G5G6G48
1080 DATA E5E6E412,D5D6D44,C5C6C48
1085 DATA F5F6F48,XYZ1,F5F6F48
1090 DATA E5E6E48,F5F6F48,G5G6G48
1095 DATA F5F6F416,C5C6C48,A6A7A58,XYZ1
1100 DATA A6A7A58,G5G6G48,A6A7A58
1105 DATA a6a7a58,A6A7A516,G5G6G48
1110 DATA A6A7A58,a6a7a58,A6A7A58
1115 DATA G5G6G48,F5F6F48,E5E6E416
1120 DATA F5F6F48,a6a7a58,A6A7A516
1125 DATA G5G6G412,F5F6F44,XYZ1
1130 DATA F5F6F428
2599 DATA W
2900 READ nt$: IF nt$ = "W" THEN  GOSUB 3000: GOTO 4000
2910 GOSUB 3000: GOTO 2900
3000 FOR x = 1 TO LEN(nt$): ak = ASC(MID$(nt$, x, 1))
3010 IF ak > 64 THEN  POKE be, ak: GOTO 3100
3015 pk = PEEK(be-1): IF pk = 88 OR pk = 89 OR pk = 90 GOTO 3030
3020 IF PEEK(be-1) > 64 GOTO 3200
3030 IF x = LEN(nt$) GOTO 3200
3040 a1 = VAL(MID$(nt$, x, 1)): a2 = VAL(RIGHT$(nt$, 1))
3050 POKE be, a1*10+a2: x = x+1: GOTO 3100
3100 be = be+1: NEXT x: RETURN
3200 POKE be, VAL(MID$(nt$, x, 1)): GOTO 3100
4000 tempo = 235: volume = 15: pointer = 29000: offset = 2
4010 POKE 27946, offset: REM (39,109)
4020 POKE 27792, tempo: REM (144,108)
4030 POKE 27793, volume: REM (145,108)
4040 POKE 27795, pointer/256: REM (147,108)
4050 POKE 27794, pointer-PEEK(27795)*256: REM (146,108)
4100 IF PEEK(27800) <> 229 GOTO 4200
4110 IF PEEK(28000) <> 195 GOTO 4200
4120 IF PEEK(28110) <> 108 GOTO 4200
4130 GOTO 5000
4200 PRINT: PRINT " ERROR!!!  SmartTUNES"
4210 PRINT " routine not detected.": END
5000 CALL 27800: END
```

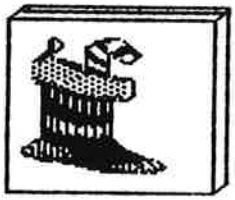
NOEL

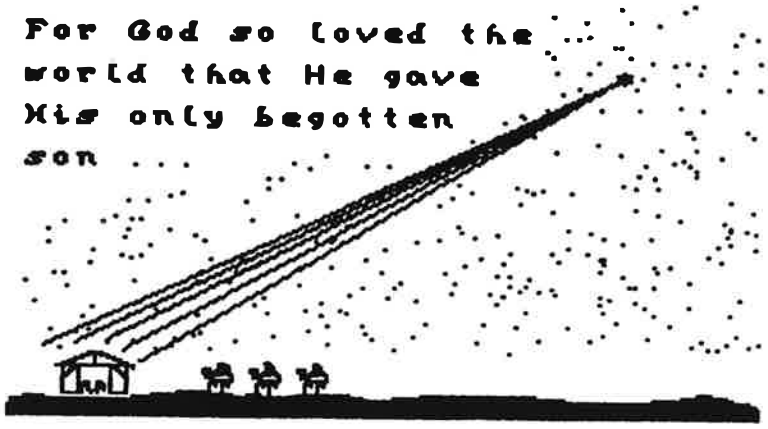
```
 100 LOMEM :32000: be = 29000
 110 PRINT " one moment please ...": PRINT
1000 REM "Hark! The Herald Angels Sing"
1010 REM must load SmartTUNES player routine first
1020 DATA D4D5D38,G4G5G38,XYZ1
1025 DATA G4G5G312,f4f5f34,G4G5G38
1030 DATA B5B6B48,XYZ1,B5B6B48
1035 DATA A5A6A48,D5D6D48,XYZ1
1040 DATA D5D6D48,XYZ1,D5D6D412
1045 DATA C5C6C44,B5B6B48,A5A6A48
1050 DATA B5B6B416,D4D5D38,G4G5G38,XYZ1
1055 DATA G4G5G312,f4f5f34,G4G5G38
1060 DATA B5B6B48,XYZ1,B5B6B48
1065 DATA A5A6A48,D5D6D48,A5A6A48,XYZ1
1070 DATA A5A6A412,f4f5f34,XYZ1
1075 DATA f4f5f38,E4E5E38,D4D5D316
1080 DATA D5D6D48,XYZ1,D5D6D48,XYZ1
1085 DATA D5D6D48,G4G5G38,C5C6C48
1090 DATA B5B6B48,XYZ1,B5B6B48
1095 DATA A5A6A48,D5D6D48,XYZ1
1100 DATA D5D6D48,XYZ1,D5D6D48
1105 DATA G4G5G38,C5C6C48,B5B6B48,XYZ1
1110 DATA B5B6B48,A5A6A48,E5E6E412,XYZ1
1115 DATA E5E6E44,XYZ1,E5E6E48
1120 DATA D5D6D48,C5C6C48,B5B6B48
1125 DATA C5C6C416,A5A6A48,B5B6B44
1130 DATA C5C6C44,D5D6D412,G4G5G34
1135 DATA G4G5G38,A5A6A48,B5B6B416
1140 DATA E5E6E412,XYZ1,E5E6E44,XYZ1
1145 DATA E5E6E48,D5D6D48,C5C6C48
1150 DATA B5B6B48,C5C6C416,A5A6A48
1155 DATA B5B6B44,C5C6C44,D5D6D412
1160 DATA G4G5G34,XYZ1,G4G5G38
1165 DATA A5A6A48,G4G5G320
2599 DATA W
2900 READ nt$: IF nt$ = "W" THEN  GOSUB 3000: GOTO 4000
2910 GOSUB 3000: GOTO 2900
3000 FOR x = 1 TO LEN(nt$): ak = ASC(MID$(nt$, x, 1))
3010 IF ak > 64 THEN  POKE be, ak: GOTO 3100
3015 pk = PEEK(be-1): IF pk = 88 OR pk = 89 OR pk = 90 GOTO 3030
3020 IF PEEK(be-1) > 64 GOTO 3200
3030 IF x = LEN(nt$) GOTO 3200
3040 a1 = VAL(MID$(nt$, x, 1)): a2 = VAL(RIGHT$(nt$, 1))
3050 POKE be, a1*10+a2: x = x+1: GOTO 3100
3100 be = be+1: NEXT x: RETURN
3200 POKE be, VAL(MID$(nt$, x, 1)): GOTO 3100
4000 tempo = 235: volume = 15: pointer = 29000: offset = 2
4010 POKE 27946, offset: REM (39,109)
4020 POKE 27792, tempo: REM (144,108)
4030 POKE 27793, volume: REM (145,108)
4040 POKE 27795, pointer/256: REM (147,108)
4050 POKE 27794, pointer-PEEK(27795)*256: REM (146,108)
4100 IF PEEK(27800) <> 229 GOTO 4200
4110 IF PEEK(28000) <> 195 GOTO 4200
4120 IF PEEK(28110) <> 108 GOTO 4200
4130 GOTO 5000
4200 PRINT: PRINT " ERROR!!!  SmartTUNES"
4210 PRINT " routine not detected.": END
5000 CALL 27800: END
```





```
  5 REM player keyboard
 10 REM must load SmartTUNES player routine first
100 LOMEM :32000
4000 tempo = 235: volume = 15: pointer = 29000: offset = 2
4010 POKE 27946, offset: REM (39,109)
4020 POKE 27792, tempo: REM (144,108)
4030 POKE 27793, volume: REM (145,108)
4040 POKE 27795, pointer/256: REM (147,108)
4050 POKE 27794, pointer-PEEK(27795)*256: REM (146,108)
4100 IF PEEK(27800) <> 229 GOTO 4200
4110 IF PEEK(28000) <> 195 GOTO 4200
4120 IF PEEK(28110) <> 108 GOTO 4200
4130 GOTO 5000
4200 PRINT: PRINT " ERROR!!!  SmartTUNES"
4210 PRINT " routine not detected.": END
5000 HOME: PRINT " SIMPLE ORGAN"
5010 VTAB 4: PRINT " qwer  uio"
5020 PRINT " asdf  jkl"
5030 VTAB 8: PRINT " <ESCAPE> = END"
5040 GET k$: IF k$ <> CHR$(27) GOTO 6000
5050 HOME: PRINT " end of program.": END
6000 IF k$ = "q" THEN  nt$ = "A": oc = 5: GOSUB 7000: GOTO 5040
6010 IF k$ = "w" THEN  nt$ = "B": oc = 5: GOSUB 7000: GOTO 5040
6020 IF k$ = "e" THEN  nt$ = "C": oc = 5: GOSUB 7000: GOTO 5040
6030 IF k$ = "r" THEN  nt$ = "D": oc = 5: GOSUB 7000: GOTO 5040
6040 IF k$ = "u" THEN  nt$ = "E": oc = 5: GOSUB 7000: GOTO 5040
6050 IF k$ = "i" THEN  nt$ = "F": oc = 5: GOSUB 7000: GOTO 5040
6060 IF k$ = "o" THEN  nt$ = "G": oc = 5: GOSUB 7000: GOTO 5040
6100 IF k$ = "a" THEN  nt$ = "A": oc = 4: GOSUB 7000: GOTO 5040
6110 IF k$ = "s" THEN  nt$ = "B": oc = 4: GOSUB 7000: GOTO 5040
6120 IF k$ = "d" THEN  nt$ = "C": oc = 4: GOSUB 7000: GOTO 5040
6130 IF k$ = "f" THEN  nt$ = "D": oc = 4: GOSUB 7000: GOTO 5040
6140 IF k$ = "j" THEN  nt$ = "E": oc = 4: GOSUB 7000: GOTO 5040
6150 IF k$ = "k" THEN  nt$ = "F": oc = 4: GOSUB 7000: GOTO 5040
6160 IF k$ = "l" THEN  nt$ = "G": oc = 4: GOSUB 7000: GOTO 5040
6500 GOTO 5040
7000 nt = ASC(nt$): POKE 29000, nt: POKE 29002, nt: POKE 29004, nt
7010 POKE 29001, oc: POKE 29003, oc+1: POKE 29005, oc-1
7020 POKE 29006, 4: POKE 29007, 87: CALL 27800: RETURN
```





PRODUCT:	AUTOWRITER
MANUFACTURER:	Mr. T. Software
MEDIA TYPE:	DDP/disk
GRAPHICS/SOUND/DESIGN:	93;93;96
INSTRUCTIONS:	94
USEFULNESS vs. PRICE:	94
RECOMMENDATION:	highly recommended
PRICE:	$15.00
RATED BY:	N&B staff

AUTOWRITER is a rather unique BASIC programming aide; it allows you to create programs containing routines that you select. The resulting program can then be merged with existing software or used as a starter for new programs to make use of the nice features of the routines. Unlike other BASIC enhancements, you decide which machine language routines (and BASIC subroutines) that you want for the module.

You simply insert the medium in the drive and pull *computer reset*. In a few seconds, Mr. T's logo screen will appear while the remainder of the program loads into RAM. Then you'll have the option to set the program's NMI clock. The AUTOWRITER program is done on a 40 column screen enhanced with inverse fonts and SmartKEY labels at the bottom of the screen. Six primary options are presented: (I) machine code routines, (II) BASIC routines, (III) POKES and CALLS, (IV) save lines in memory, (V) print options, and (VI) quit. The first two options let you select the routines that you want for your module. The third option will list the routines or allow you to search through them by entering a keyword. The fourth option stores the module to tape or disk. The fifth option will print the routines on paper.

Many of the routines are derived from ones we've printed in N&B, for example, instant underscored fonts, instant text color changes, and text on hi-res screens. You could hunt through back issues for some of these, adjust the addresses so that they are compatible, and type them in. This alone could become a major project. AUTOWRITER frees you from this keypress drudgery allowing you to spend you programming time on the body of your programs rather than on the enhancements which make them appealing and user - friendly.

Yes, AUTOWRITER automatically adjusts the addresses of the included machine language routines so that you may combine them in any sequence!! This alone is quite a creative feat. Moreover, the programming time that this innovative utility will save you and the professional features of the program make it a very good value.

PRODUCT:	Sprite Power
MANUFACTURER:	Digital Express
MEDIA TYPE:	DDP/disk
GRAPHICS/SOUND/DESIGN:	90;80;95
INSTRUCTIONS:	80
USEFULNESS vs. PRICE:	99
RECOMMENDATION:	highly recommended
PRICE:	$14.95
RATED BY:	Bob Zimmerman, PSAN

One of the most frequent questions that beginning programmers ask is "How do I use sprites in games?". That question was difficult to answer since SmartBASIC was not designed with sprites or sprite animation in mind. Now, however, we have Sprite Power. This program not only answers the question; but, is also a versatile tool in manipulating sprites, designing sprites, saving sprite data, and answering questions that most of us haven't even thought to ask!

The program is totally machine code; operation is FAST. And, like other Digital Express software, Sprite Power is menu-driven and user selections are made via SmartKEYs. A nice feature about the program is that there are 3 pre - defined sprite files included: alphabet letters, geometric figures, and miscellaneous objects. My favorite are the objects. You can load the sprites and then choose the "Animate Sprites" function. By switching back and forth between several sprites, it's easy to see a jumping cowboy or a talking starboy. Designing sprites is easy. The required program controls are shown on-screen so that you can sit down and start designing sprites immediately. The sprite design is created by filling in squares on a 16 x 16 grid, which is 8 times larger than a normal sized sprite. You have the ability to reverse the design grid, invert it, and flip the design.

When done designing your sprites, you save your creations by using the "store file" option. Your sprites can be saved to tape or disk in 3 different forms: ASCII DATA, BASIC BINARY, or Z80 BINARY. Another feature of the program is the ability to capture portions of hi-res graphic pictures as sprites. PUPP is included as a hands-on example of how sprites can be used in an arcade quality game! This game alone makes the program worth the $14.95. Sprite Power, with its 25-page manual, is the programmer's answer to sprite design and control -- another winner from DIGITAL EXPRESS.

ADAM USERS' GROUPS

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BULLETIN BOARD

New newsletter: ADAM'S ALIVE
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Garland, TX 75040

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Bay Shore, NY 11706

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Salt Lake City, UT 84106

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Mike McCauley's

Stage Fright

When programmer Mike McCauley set out to create Stage Fright, he wanted to make an adventure game of almost impossible complexity -- he succeeded. Stage Fright took Mike over two years to create and is without a doubt the best text adventure ever made for ADAM.

In Stage Fright, you become an actor or actress trapped in an abandoned theater. Unlike most adventures which only give the player one goal to reach, Stage Fright integrates three challenging rounds into one game! This means much longer playability.

ROUND ONE leaves you trapped in the empty theater building. You must find the clues and tools to overcome a dozen traps and obstacles to get out. ROUND TWO sends you back in to get rich, overcome another half dozen traps and find a second way out. And finally, in ROUND THREE you get sealed back in again, must perform a rescue, retrieve a special object, and for the final bow, you must come up with the miracle of getting out of this place while all the exits remain sealed.

Stage Fright has all of the features that you would expect from a game of this complexity. You can save your game at anytime (save up to six games). Stage Fright also includes music, text animation, function keys for ease-of-use, puns, and much more!

PROGRAMMING UTILITY SOFTWARE

□□□ 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

□□□ 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

□□□ 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 STDMEM

□□□ 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

□□□ SmartTRIX (by DATA DOCTOR) $29.95 (retail) $14.95 (SDP)
* a set of 10 excellent programming aids; two very nice sprite programs; 60 page manual; disk & DDP versions not compatible

□□□ 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

□□□ 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

□□□ 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

□□□ 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 EXTMEM command

□□□ 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 EZfileXFER; much, much faster than a Coleco disk drive

□□□ 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), EZfileXFER2 (faster than EZfileXFER)

□□□ 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

WORD PROCESSING ENHANCEMENTS

□□□ 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)

□□□ 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 SmartWriter) and SmartBASIC; requires Centronics parallel interface, a Panasonic KXP-1080 or 1080i printer, and at least a 64K expander

□□□ 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 Panasonic line of printers and the Okimate 20; does NOT include line justification commands or internal document margin control

RECREATION/GAMES SOFTWARE

□□□ 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

□□□ 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

□□□ Kid's TriviaPac (by Mr. T. SOFTWARE) $17.95 (retail) $14.95 (SDP)
* 1080 questions; 6 categories; one to four players; graphics and sound; hall of fame; many hours of fun

□□□ Strategy Strain (by DATA DOCTOR) $18.95 (retail) $14.95 (SDP)
* nine intellectually challenging computer classics; graphics and sound; good Star Trek game

□□□ 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

□□□ 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

□□□ 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

GRAPHICS DESIGN SOFTWARE

□□□ 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 FX / IBM 5152 printer codes); printing graphics requires Centronics parallel interface for printer

□□□ 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)

□□□ 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

□□□ SpritePOWER (by DIGITAL EXPRESS) $19.95 (retail) $14.95 (SDP)
* 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 PUFF; includes 11K ramdisk (does not require 64K expander); totally Z80 program

□□□ PowerPAINT (by DIGITAL EXPRESS) $44.95 (retail) $35.95 (SDP)
* the most extensive graphics design program available for the ADAM; machine code program using Coleco-like graphics; a variety of file storage and retrieval options; quick global color changes; move, copy, and erase options; many hardcopy print options; enlarge and scroll options; four screen pictures; uses FontPOWER font sets (three size options) and CLIPPER clip art; requires at least a 64K memory expander; requires a Centronics parallel interfaced Epson FX or IBM 5152 compatible dot martrix printer for hardcopies

EDUCATIONAL SOFTWARE

□□□ Spanish Vocabularian (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

□□□ QuikFax Quest (by DATA DOCTOR) $18.95 (retail) $14.95 (SDP)
* three academic quizzes; includes study mode (on - screen and hardcopy); US capitals, world capitals, and Chemistry elements

COLECO COPYRIGHTED SOFTWARE

□□□ SmartLOGO (data pack only) $23.95 (retail) $19.45 (SDP)
* Coleco's version of the popular structured language; good for graphics and sound control; 350+ page manual

□□□ SmartFILER (data pack only) $17.95 (retail) $13.45 (SDP)
* Coleco's general purpose database program; easy electronic filing system; search features; 38 page manual

□□□ ADAMcalc (data pack only) $25.95 (retail) $19.95 (SDP)
* advanced electronic spreadsheet; comes with sample templates; 154 page manual

□□□ CP/M 2.2 (data pack only) $34.95 (retail) $29.95 (SDP)
* Coleco's version of the still popular operating system; 1000's of public domain supporting programs; 250+ pages

GUIDES/BOOKS/INSTRUCTIONS

☐☐☐ Hacker's Guide (vol 1) (by Peter & Ben Hinkle) $12.95 (retail) $10.95 (SDP)
* The Hinkle's in - depth guide to the technical aspects of exploring ADAM; 60 pages; 18 programs

☐☐☐ Hacker's Guide (vol 2) (by Peter & Ben Hinkle) $12.95 (retail) $10.95 (SDP)
* The Hinkle's detailed guide to SmartBASIC V1.0; 110 pages; HELLO program includes several BASIC fixes and enhancements

☐☐☐ Hacker Software (by Peter & Ben Hinkle) $5.95 (retail) $4.95 (SDP)
* all the programs from volumes one and two (above)

☐☐☐ 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

☐☐☐ 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

☐☐☐ ez ref 103 (by DIGITAL EXPRESS) $2.45 (retail) $1.95 (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

☐☐☐ Pinball/HardHat Guide $2.45 (retail) $1.95 (SDP)
* 40 pages of instructions for the popular public domain package; holes drilled for easy binder insertion; includes Pinball reference chart

"NIBBLES & BITS" SOFTWARE

☐☐☐ N&B binder01 (by DIGITAL EXPRESS) $32.95 (retail) $27.95 (SDP)
* all six issues from 07/86 thru 12/86; sturdy 3-ring binder; includes two DDPs or two disks containing all the programs

☐☐☐ N&B binder02 (by DIGITAL EXPRESS) $32.95 (retail) $27.95 (SDP)
* all six issues from 01/87 thru 06/87; sturdy 3-ring binder; includes two DDPs or two disks containing all the programs

☐☐☐ 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

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DECEMBER SPECIALS

With any order received between 12/1/87 and 1/15/88, we'll include a surprise gift. For any order with a subtotal over $50.00, we'll include two surprise gifts. Some of the gifts include: a blank 5.25" disk, a blank Sony DDP, 100 vinyl coated paper clips in various colors, a Bic roller pen (black ink), and a Bic mechanical pen. Order today ... Christmas is just around the corner!!!

☐☐☐☐☐☐☐☐☐☐☐

MISCELLANEOUS SUPPLIES

☐☐☐ Coleco/LORAN digital data packs	$33.95 (retail--for 10) $29.95 (SDP--for 10)	$4.95 (retail--each) $3.95 (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)

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☐☐☐ plain lable 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) $14.75 (SDP--for 3)	$5.75 (retail--each) $5.25 (SDP--each)

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☐☐☐ 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

☐☐☐☐☐ "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).

☐☐☐☐☐ The product prices listed herein may be subject to change after January 15, 1988.

Public Domain Software Info

Public domain software is offered as a quick, inexpensive means for your 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 the quality regarding these packages. If, however, the storage medium itself proves defective within 90 days of purchase, we will replace it free of charge.

You may get any of the volumes described below on digital data pack for $5.95 or on disk for $4.95. Subscribers also have an option to get a volume FREE (limit three per calendar month); this option does not apply to volumes in the "Coleco PD 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.

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.

SmartPAINT FILES LIBRARY

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

N&Bpix (volumes 001 thru 012): 13 files each.
Art Gallery (volumes 1 & 2, compiled by REEDY SOFTWARE): 13 files each.

Coleco PD LIBRARY

SmartBASIC 2.0: improved interpreter; 49K file; works with or without 64K expander
Pinball/HardHat Mac: latest version with two demo games; 1 to 4 players.
ADAMlink II: supports up and down loading of SW compatible files; includes U/D docs.
Jeopardy: just like the game show; greate graphics; 1 to 3 players.
Super SubRoc: 90K arcade-type games; super graphics; hall of fame.
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 disk drive.
SmartBASIC 1.0: a replacement for the BASIC that came with your ADAM.

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/Mutil: a variety of utility .COM files for CP/M.

PINBALL GAMES LIBRARY

PBgames (volumes 01 thru 04): 10 pinball games each; self-booting.

MISCELLANEOUS COLLECTIONS LIBRARY

MWplus01: a collection of improvements to MultiWrite (required).
N&Bacalc01: several paradigm and other files; 148K.
EZpak: self-booting medium; contains EZmenu & EZcopy.
ezFILER: self-booting medium; contains nic BASIC address filer.
SHAPEMAKER: several font shape tables; nice shape design utility.
N&Blogo01: a variety of SmartLOGO (required)

DEI's latest PD: One Minute FORMATTER self-booting, can be BRUN from SB 1.0, formats 1 or 2 drives (simultaneously), any combo 1 or 2 sided, logon control, independent names, vol & dir sizes, etc.

Volume Title: N&BpixO10
(13 hi-res pictures in SmartPAINT format)

3DP01.HRP (hi-res graphics plotting)
3DP02.HRP (more hi-res graphics plotting)
Sailer.HRP (drawing of a boat sailing in a lake)
Sboat.HRP (enhanced picture of boat in lake)
ROLLS.HRP (drawing of a Rolls Royce Silver Spirit)
Betty.HRP (Betty Boop)
drink.HRP (two beverage glasses)
AC01.HRP (ADAMcalc screen with calculator windowed on IRA analysis)
AC02.HRP (ADAMcalc screen command list)
AC03.HRP (the ADAMcalc screen color selections)
clip02.HRP (manger, donut, "NOEL", and a ginger bread man)
clip03.HRP (money clip, steaming coffee cup, flower, and a swirl)

Volume Title: N&BpixO11
(13 hi-res pictures in SmartPAINT format)

3DP03.HRP (hi-res graphics plotting)
3DP04.HRP (more hi-res graphics plotting)
SpaceV.HRP (drawing of three space vehicles)
Tank.HRP (drawing of a combat tank)
AirBal.HRP (an air balloon to display a short message)
SeaSho.HRP (a seashore scene)
SP01.HRP (SpritePOWER screen with rabbit sprite on grid)
SP02.HRP (same as previous with sprite reversed)
Kate.HRP (Capt. Kestrel of the Gerry Anderson cartoon)
clip04.HRP ("around the corner", "joy", tulip, and cat's head)
castle.HRP (drawing of a castle)
slot.HRP (colorful drawing of a slot machine)
xmas01.HRP (colorful Christmas graphics scene)

Volume Title: N&BpixO12
(13 hi-res pictures in SmartPAINT format)

NOEL.HRP (drawing of a nativity scene and an excerpt from John 3:16))
map.HRP (a drawing of the contiguous USA)
piano.HRP (the chromatic scale depicted on a piano keyboard)
notes.HRP (drawing of the duration form of musical notes)
USA.HRP (another drawing of the contiguous USA)
serp.HRP (serpinski curves)
sphere.HRP (3-D sphere)
spiro.HRP (symetrical shape)
ADAM.HRP (drawing of the ADAM system)
phone.HRP (a standard push-button desk phone)
roldex.HRP (a graphic information card)
DavidC.HRP (a digitized photo of David Carmichael)
Criste.HRP (a digitized photo of actress/model Criste Brinkley)

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NIBBLES & BITS

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