NIBBLES & BITS

The Comprehensive Monthly Newsletter for ADAM Users

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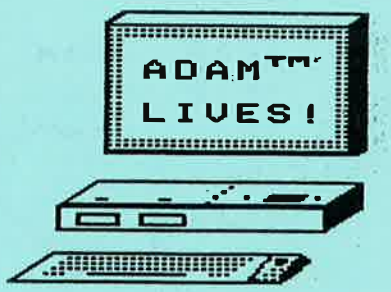

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THE N&B STAFF 2
PUBLIC NOTICE 2
DISCLAIMER. 2
EDITOR'S NOTE 3
N&B NEWS. 3
ADAM NEWS 4
EXPANDING YOUR SYSTEM 5
ADAM USERS FORUM. 6
BIT BY BIT
The NEW Command. 7
BYTE-SIZED BASIC
POKEs to Play With (part 7). 8
SmartBASIC 2.0 Features (part 3) 9
State Capital Quiz Notes 14
Trigonometric Graphics (part 2). 14
HACKER'S DELIGHT
Previous Program Notes 15
More Patches 15
Coming Next Month. 16
Graphics Fonts 16
EZkeys 16
GETTING INTO CP/M 2.2
The CONFIG Command 22
ADAM PRODUCT REVIEWS. 23
ADAM ACCESS 25
LOCAL ADAM USERS GROUPS 27
BULLETIN BOARD. 27
PRODUCT LIST. 28
PRODUCT ORDER FORM. 30
PUBLIC DOMAIN SOFTWARE. 31

This issue includes 8 SmartBASIC program LISTs and 4 assembly language lists.

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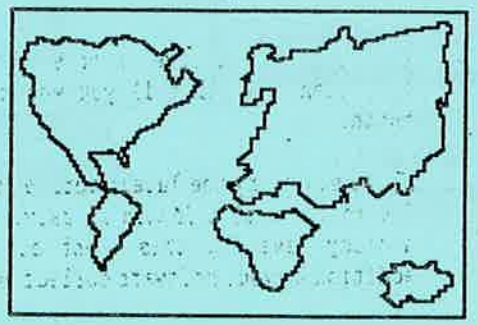

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EDITOR'S NOTE

One aspect of running DIGITAL EXPRESS that amazes me is the sheer bulk of mail that we receive. The vast majority is subscriptions, renewals, and product orders. But a considerable portion consists solely of programming questions and compliments on our newsletter.

For the last couple of months I've tried to answer all the mail personally. You sure keep me busy; but, I enjoy it thoroughly. Although teaching is my profession, I've become quite an addict to computers in general and ADAM specifically over the past couple of years. Your questions and comments often spark an interest that leads me down a new path of exploring ADAM. More than half of each newsletter is the direct result of such explorations.

In short, NIBBLES & BITS is to a large extent a reflection of our readers. You'll note, though, that most of our program LISTs don't include a lot of advanced features. We leave the embellishments to your discretion. Sometimes enhancing a program can be just as much fun (and educational) as writing the first working draft.

We've received a lot of compliments on a few of the programs. These include: BlockPAINT, the PatchWORK series, and the new BASIC 1.Ø bootstrap.

This month we've got two of my personal favorites; both are LISTed in the HACKER'S DELIGHT department. EZkeys patches over a section of ADAM Operating System to enhance BASIC programming. It provides automatic keyclick in immediate or programming mode. And, it makes multi-drive systems more convenient to work with by using the SmartKEYs. You can turn the features on or off by pressing CONTROL + V.

The other goody demonstates how to actually print ADAM's standard characters on the high (HGR) or low (GR) resolution graphics screen. You can even enlarge the characters.

Both of these programs are the result of submitted programming questions. So ... keep those questions coming!!!

Dr. Solomon Swift
EDITOR-IN-CHIEF

N&B NEWS

☐ We have the five winners of our Jeopardy promotion. We'll tell you who they are next month.

☐ We now carry the latest version of SmartBASIC 2.Ø in our public domain library. If you don't already have it, this might be a worthwhile addition to your software collection.

☐ We have well over a thousand individual public domain programs. These include Coleco, BASIC 1.Ø, CP/M 2.2, AdamCalc, and SmartLOGO. The list on page 31 reflects only a small portion of these; we are still sorting and compiling the remainder. A few individuals have made significant contributions to this vast wealth of programs. Below is a list of these generously helpful ADAMites. Thank you very much!!!

David Carmichael
Scotty Carroll
Norman Castro
Terry Fowler
Robert Hopstetter
Walter Wright

☐ We now have printwheel albums in stock. The retail price on these is $9.95. We purchased a large quantity at closeout prices; and, we're passing the discount on to you. While supplies last, you can get one for only $3.95. Each album holds 6 daisy wheels. You have 2 colors to choose from: burgundy or gray.

☐ We are compiling volumes of SmartPAINT high resolution graphics pictures (from ShowOFF I). Our first volume is finished. Each volume includes 13 (a baker's dozen) picture files.

☐ For this month's special, we're offering a discount on back issues of N&B. Until February 28, you can get any issues you've missed for only $2.95 each.

☐ We've also added a new item to the product list. You can now get the first six issues of N&B in a sturdy three-ring binder along with two DDPs or disks containing all the programs (from the issues) for only 24.95. Non-subscribers can get the same package for $29.95.

☐ Don't forget about the ShowOFF I SmartPAINT picture design contest. The contest is for the best judged picture file created with SmartPAINT. There is no limit to the number of picture files that you can enter. All entries must be on a data pack or disk. If you include a return mailer with sufficient postage, we'll send you a SmartPAINT PD volume in exchange. Entries will be judged on creativity and attention to detail; decisions of the judges are final.

We've extended the deadline to 4/1/87. The three winners shall be notified no later than 4/15/87. The first place prize is $100.00 plus a one year subscription extension. The second place prize is $25.00 plus a one year extension. And, third place gets a free one year extension.

All entries will be considered public domain. So ... you'll not only have a chance at the prizes; but, you'll also increase the number of available pictures for all ADAMites who use ShowOFF I.

☐ Due to an oversight, the standard ShowOFF I prints an extra line feed on the Star printers (SG-10, SG-15, NX-10, and the NL-10). When you order from us, be sure to specify the impact dot matrix printer that you're using. If you order from one of our distributors, you'll see a loose sheet inside the manual that gives instructions for getting a free Star update.

☐ We will customize the ShowOFF I print routine for any printer connected to ADAM via the Orphanware or Eve Electronics Centronics parallel interface. Just let us know which printer you're using and we'll give you further instructions.

☐ Please note that DEI now carries the two excellent trivia packages from *Mr. T. Software*.

ADAM™ NEWS

☐ One of the drawbacks of using the public domain volume Pinball Construction Set is the lack of instructions. E & T SOFTWARE now carries the 40 pages of instructions for only $2.00. Their address is:

E & T SOFTWARE
P.O. Box 821242
Dallas, TX 75382-1242

☐ Walters Software has recenctly released two exciting programs. Jeopary Writer allows you to create/edit question packs for the extremely popular Jeopardy public domain program. RAMdisk allows you to access the 64K expander directly from SmartBASIC 1.0. You can SAVE and LOAD programs on the expansion RAM card just as if it were a super fast disk drive. If you have the 64K expander, this program will certainly be a welcome addition to your software library. See this month's BULLETIN BOARD for the address of Walters Software.

☐ Reedy Software has a new package of games underway. They're the developers of the very popular packages Entertainment Pack 1 and MageQuest.

☐ VMC Software, a new ADAM supporter, has developed two new packages for ADAM. Their address is:

VMC Software
P.O. Box 326
Cambria Heights, NY 11411

☐ Norman Castro (founder of the Omaha ADAM Users Club) has sharply duplicated reprints of the instructions for 120 different game cartridges. For more information write to:

Norman R. Castro
809 West 33rd Avenue
Bellevue, NE 68005

☐ L.O.F. Communications offers an interesting service for ADAM users. They will digitize and convert to an RLE file photographs that you send to them (more on RLE files in this month's EXPANDING YOUR SYSTEM department). The cost is only $5.00 for the first photo and $3.00 for each additional photo. Be sure to send $2.00 for return postage and include one DDP or disk for every 10 (or less) photos. Also, be sure to put your name and address on the back of each photo. Make checks payable to: Charles F. Summers, III. The address is:

L.O.F. Communications
P.O. Box 587
York, PA 17405-0587

EXPANDING YOUR SYSTEM

PRINTER ALTERNATIVES

(part 3)

We've gotten a lot of response from our readers to this series of articles. One question is often asked: 'Do I really need a second printer?'

There are four fundamental advantages of impact dot matrix printers over the standard ADAM printer. These printers are much quieter and are considerably faster (generally 1Ø to 2Ø times faster). Also, these alternative printers usually offer a variety of typeface styles and sizes -- a very nice feature for word processor users. Another, very strong, point worth considering is the 'awesome' capability to actually print graphics screens.

This is one particular field that has just recently been tapped into with ADAM. Programs like GraphixPainter (by Wayne Motel of NIAD) and our own ShowOFF I are two of the first graphics printing programs for ADAM (ShowOFF I has a drawing function also). In the months and years to come, there will, no doubt, be a larger variety for you to choose from.

One of the more intriguing areas of computer graphics is RLE files. RLE stands for Run Length Encoded. These files have been around for a few years. But, they have only recently started becoming widespread among ADAM users.

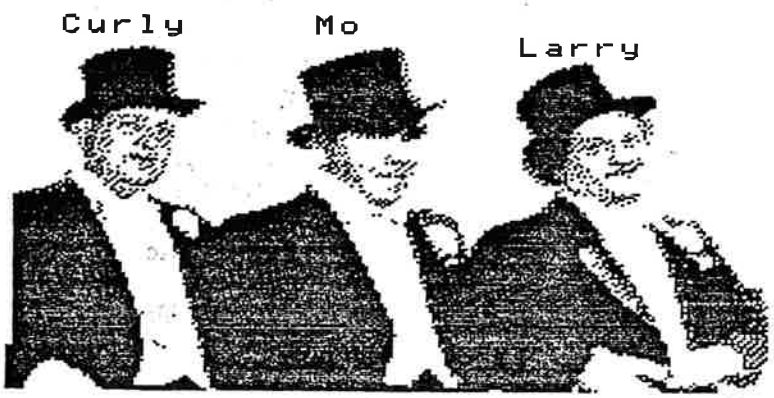
RLE files are generally the result of digitized video camera pictures. These pictures are 'captured' from still photographs, drawings, and real life images.

Digitizing is a process of converting these images to a series of one's and zero's that the computer can understand. The advantage of RLE files is that they are standardized. Thus one computer can use a picture file created by another computer. Most computer telecommunication services include a library of RLE files. Thus many picture files are transferred via modem as RLE's.

Generally, RLE files are designed for computers that have at least a graphics mode of 256 by 192 pixels (such as ADAM's HGR2 mode). Converting an RLE file to a hi-res picture on ADAM involves checking each screen dot location to see if it needs to be HPLOTted. This process can take as long as five minutes. However, once the picture is drawn, you can use techniques we've discussed in previous issues to store the screen as a FAST hi-res ADAM picture file.

Next month we'll LIST a program in the HACKER'S DELIGHT department that will translate RLE files into ADAM graphics. This program will allow you to store the final hi-res screen as one 1ØK file or as four 3K files (for use with SmartPAINT from ShowOFF I).

Some of the files in our SmartPAINT public domain volume(s) are RLE translations. The picture below is an example of an RLE file stored in SmartPAINT format.



ADAM™ USERS FORUM

The following questions and comments have been culled from recently received mail. Generally, both the reader's input and our response are excerpted from the actual correspondence.

BRUN/BLOAD BUG

I've used Intel-LOAD a lot. When I use one program to BRUN another, I find that I can not use the BRUN <filename>, d# command. I always get the 'incorrect OS command' error message. To get around the error, I have the controlling program first ask me for a drive selection and then it POKEs the drive code (8, 24, 4, or 5) into address 16821 and then just BRUN <filename> (without the drive suffix).

Jim Guenzel
Maryland Heights, MO

IN RESPONSE: Indeed, SmartBASIC does have a bug with this command. When you use the BRUN or BLOAD command, the BASIC interpreter expects the file's address to follow the comma (pages B-4 and B-5 of the operating manual). This is patently an unnecessary restriction. Here's a simple POKE trick that will instantly take care of the problem. Now you can BRUN <filename>, d#.

POKE 21Ø19, 11 [RETURN]

Note: I modified my actual reply considerably for the benefit of novice programmers.

USING ADAM WITH THE VIDEO RECORDER

Having recently returned from a vacation in Hawaii, I am presently working on making my video vacation tapes into sort of a travelog with captions and commercial type 'breaks' to make the tape more interesting. I am wondering if any of your readers do the same. I save many instructions and interesting letters on my video for reference. Using your computer makes it a snap.

Walter Wright
490 - 17th Street
West Babylon, LI, NY 11704

A VARIETY OF QUESTIONS

☐ I have an old copy of SmartBASIC 2.Ø. Is there a way to know if it is the most recent (ie, via a PEEK)? If it's not the most recent, how can I obtain one?

☐ How can I obtain software for CP/M? Do you supply any public domain software or know of anyone who does?

☐ What would the POKEs be to make the PRINT key = CNTL+P or CLEAR to be the HOME key?

☐ Could you provide an assembly program to allow all the print output to go to a purchased printer rather than the ADAM printer (as the PR#2 command does in Intel-BEST)?

Robert L. Silvagni
Rocky Hill, NJ

IN RESPONSE: Determining the revision of BASIC 2.Ø with absolute certainty is a little bit tricky. I have heard from several different sources that address 1653 contains the revision number. Unlike BASIC 1.Ø, though, this vastly changed version circulated in the software underground for a couple of years. Occasionally a hacker would change the values at some addresses (default screen colors, etc.) without actually modifying the interpreter and claimed to have just gotten the very latest version. A lot of us were duped, at first, by this tomfoolery. Some of the true early versions had commands that wouldn't even work. Until about a year ago the APPEND and EXTMEM commands had severe bugs.

There are two tests that I use to determine the revision. PRINT PEEK(26Ø) should reveal a 52. Also, try this. Execute EXTMEM (provided you have the 64K expander). Then POKE any nonzero number into address 16782. The early versions used this as a flag address to permit PEEKing expansion RAM; it did NOT permit POKEing into expansion RAM. The latest version also allows you to POKE into the RAM expander. However, there is apparently no simple way to get back to standard RAM PEEKs and POKEs.

- continued on the next page -

A few months ago I patched over the initialization routine (not the bootstrap) so that BASIC automatically executed EXTMEM and a HELLO search when booted. Despite the several hours to develop this patch, I somehow misplaced it. It may even be one of the versions in circulation. Nonetheless, I'll develop a similar patch for an upcoming issue.

Now to the second question, several ADAM users groups have huge libraries of CP/M PD's for ADAM; NIAD probably has the most extensive collection. Elliam Associates and Eve Electronics also stock copyrighted CP/M software and offer a conversion service for some titles. And, we've just begun to list our CP/M volumes. The first two of these are filled with games.

In the BYTE-SIZED BASIC department this month we've listed the two POKEs in question. We had planned to include a PR#2 command in this issue; however, the extensive assembly language lists forced its postponement till next month.

NOTE: My response here was somewhat more elaborate than the written reply for the benefit of novice programmers.

A QUIET PRINTER ENCLOSURE

NOTE: Here's a handy tip for you craftsman. Please don't attempt the following project if you are under age.

I have built a plexiglass enclosure for my ADAM printer and it must have reduced the noise level by a factor of 10. It was easily fabricated using 1/8" plexi and took about one hour to cut out on a table saw and to glue together with methylene chloride. The top is 15" by 16"; the sides are 7" by 14 3/4"; the front and back are 7" by 16" with a cutout in the back of 2 1/2" by 7" for cords and air exchange.

Thomas G. Gray
2236 Epworth Street
Victoria, British Columbia
Canada V8R 5L1

BIT BY BIT

THE NEW COMMAND

The NEW command is used to clear the current BASIC program from memory. You can use it in the immediate mode (without line numbers). For example:

```
NEW   (RETURN)
```

Or, you can include on a program line. For example:

```
10 INPUT "Are you done?"; answer$
20 IF answer$ <> "y" THEN GOTO 10
30 NEW
```

When you RUN this simple program, it will repeat the question until you press the 'y' key. When you do, the program will erase itself from memory. This is essentially an alternative to the END command. But, you should use the NEW command with caution. You could accidentally erase a program that you've been working on for a long time. There is no easy recovery once the program is gone.

In the light of this possibility, it's a good idea to SAVE your program frequently while you're working on it. And, always SAVE a program before RUNning it for the first time.

Generally, you'll get the best results by SAVEing the partially completed program about every 30 minutes of typing. You'll probably find this safeguard easiest to work with if you use version numbers in the filename. For example, the first time you SAVE it you could use the filename test001. Then after about 30 more minutes of typing, you could SAVE the updated program as test002, and so on.

Once you've used this technique a few times, it'll be second nature to you. It not only protects your efforts from an accidental NEW; but, it also guards against significant loss from power outages and system lockup (programs that crash -- usually by dint of keypunch errors).

BYTE-SIZED BASIC

POKES TO PLAY WITH

(part 7)

CONTROL FUNCTIONS (part 2):

In the October issue we revealed the POKEs to change some of BASIC 1.Ø's control functions (CNTL + another key). With this information you can change two-key inputs to a single keypress function. To recap:

To change CNTL+C to [ESCAPE],
POKE 16134, 27

To change CNTL+N to [INSERT],
POKE 12374, 148

To change CNTL+O to [DELETE],
POKE 12375, 151

To change CNTL+S to [WILDCARD],
POKE 16135, 144

This month we've got two more similar conveniences. These are a little more complicated in that more than one address must be POKEd.

To change CNTL+P to [PRINT], you need to POKE two addresses. The default (original) value in each of these is 16.

POKE 17302, 149
POKE 18320, 149

To change CNTL+L to [CLEAR], you need to POKE three addresses. The default value in each of these is 12.

POKE 12300, 150
POKE 18307, 150
POKE 19311, 150

DETERMINING THE GRAPHICS MODE:

The BASIC interpreter uses address 17000 as an indicator of the current graphics mode. You can PEEK (17000) in your programs to make decisions based on this information. Each of the four modes is assigned an arbitrary number. The values are:

Ø for TEXT
1 for GR
2 for HGR
3 for HGR2

DATA POINTERS:

Here's how to determine the current LOMEM value:

```
PRINT PEEK(16095) * 256 + PEEK(16096)
```

Here's how to determine the number of program lines currently in memory:

```
PRINT PEEK(16091) * 256 + PEEK(16092)
```

Here's how to determine the line number for ONERR GOTO:

```
PRINT PEEK(16126) * 256 + PEEK(16127)
```

DATA VALUES:

The following addresses contain the specified value.

16129: current SPEED value
16763: last horizontal HPLOT
16764: last vertical HPLOT
16765: current SCALE value

INCREASING THE POTENTIAL LINE LENGTH:

Address 12105 contains the maximum length of a program line that you can enter. The default value is 128. You can set it as high as 239. This way you can get a lot more commands on each line and therefore save some memory (each BASIC line uses at least five bytes of memory).

SmartBASIC 2.Ø FEATURES

(part 3)

USING THE 64K EXPANDER:

One of the nicest features of SmartBASIC 2.Ø is that it gives you an option to use the 64K expander. To do so, you just execute the EXTMEM command. To go back to normal memory usage, you just execute the STDMEM command. Both commands require that you have the medium that SmartBASIC 2.Ø was booted from in the drive.

In STDMEM, you have 26401 free bytes. In EXTMEM, you have 90656 free bytes. That's certainly a lot of space for a BASIC program.

In BASIC 1.Ø the actual BASIC program consists of several tables. Some expand upward from 27407 and the others expand downward from 53632. In BASIC 2.Ø (in EXTMEM) only the line number table (four bytes for each program line) is in standard RAM; it expands downward from 53632. The rest of the tables start in expansion RAM. If the BASIC program gets too large (63K +++) it carries over back to standard memory.

With this arrangement of tables, you can set LOMEM very high. For instance, you could set LOMEM to 48000. This would give you about 21K for machine code routines, etc. and about 63K for a BASIC program. This combination is quite a luxury for hackers.

COMPATIBILITY:

All of BASIC 1.Ø's commands are compatible with BASIC 2.Ø. Most simple 1.Ø programs will work perfectly well with 2.Ø. There is one important shortcoming though. Nearly all the common POKEs are different with 2.Ø. This means you'll have to edit all your programs that POKE into the interpreter's area of RAM. You'll have to change the screen color POKEs, the POKE limit reset POKEs, etc. And, you'll need to eliminate the 1.Ø POKE to turn the cursor off. BASIC 2.Ø automatically turns the cursor off until an input is expected from the user.

Another point to consider is that binary converted (fast run) BASIC 1.Ø programs can NOT be executed with 2.Ø. This is why we developed Intel-LOAD V2.Ø (the binary converter for SmartBASIC 2.Ø).

WORKING WITH SPRITES:

Over the next couple of months we'll take a look at sprites and SmartBASIC 2.Ø's powerful sprite commands. First let's touch briefly on sprites.

Sprites are graphic patterns which provide for smooth animation on the video screen. They are fairly easy to create. ADAM's video chip supports up to 32 sprites on a single screen. They can be used in TEXT, GR, HGR, and HGR2 modes. Sprites are not available in 40 column TEXT mode.

The sprites are given screen priority by their number. The first sprite has a higher priority than the second one, and so on. The thirty second sprite has the lowest priority. The priorities are important because each sprite occupies a different level in the foreground. All sprites appear to be on top of standard text and high/low resolution graphics. Moreover, higher priority (lower numbered) sprites appear to move atop lower priority sprites. There is one limitation to all these levels of screen depth. No more than four sprites can be seen at any single vertical coordinate (horizontal plane).

Sprites can be positioned at any screen pixel location. Thus, they can have a vertical position of '0' through '191'. And, they can have a horizontal position of '0' through '255'. A sprite can be colored in any of ADAM's 15 standard hues. However, each sprite must be entirely one individual color.

There are two basic sizes of sprites: 8 by 8 pixel sprites have the same dimensions as ADAM's standard characters and, 16 by 16 pixel sprites permit more detailed designs. Each size may be enlarged to double magnification. But, this enlargement option works for all visible sprites; magnification can't be set individually, as with hi-res shapes.

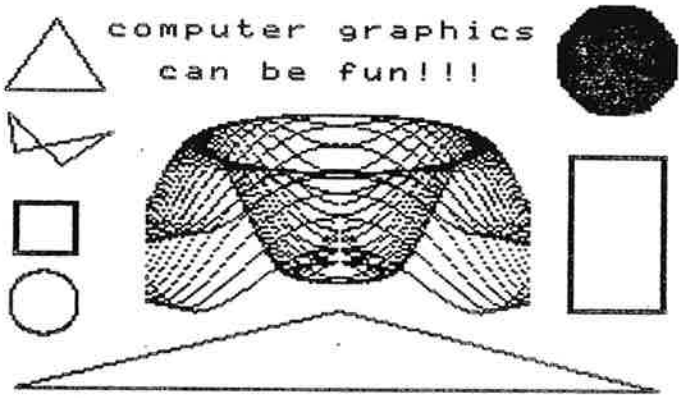
All the Coleco Super Games make use of sprites for animation. And with SmartBASIC 2.Ø you can easily enter a new, exciting area of programming using the built-in sprite commands.

- continued on page 13 -

```
  10 REM simple US state capitals quiz
  20 REM demonstrates use of RND patch to BASIC 1.0
  30 REM and randomizing data techniques
 100 IF PEEK(259) = 210 GOTO 10000: REM BASIC 2.0 test
 110 POKE 17059,9: POKE 17115,27: POKE 17126,246: POKE 16953,0
 120 TEXT: SPEED  = 255: nb% = 50: DIM st$(nb%),cp$(nb%),du$(nb%)
 130 INVERSE: PRINT " simple state capital quiz ": NORMAL: PRINT
 140 PRINT: PRINT " one moment please ..."
 150 REM RND patch
 160 DATA 229,42,64,63,35,34,64,63,225,201
 170 FOR x = 172 TO 181: READ ml: POKE x,ml: NEXT
 180 POKE 171,0: POKE 11907,201
 190 FOR x = 1 TO nb%: READ st$(x),cp$(x): NEXT
 200 FOR x = 1 TO 6: READ menu$(x): NEXT
 210 FOR x = 0 TO 10: READ rate$(x): NEXT
 500 HOME: PRINT " Which option do you prefer?"
 510 PRINT: FOR x = 1 TO 6: PRINT " ";x;" = ";menu$(x): NEXT
 520 GET key$: key% = VAL(key$)
 530 IF key% < 1 OR key% > 6 THEN  PRINT CHR$(7);: GOTO 520
 540 IF key% = 6 GOTO 10000
 550 lo = 10*key%-9: hi = lo+9: q1 = hi-lo+1
 600 HOME: PRINT " ";: INVERSE: PRINT " easy review page ": NORMAL
 610 PRINT: PRINT: PRINT " ";: INVERSE: PRINT SPC(4);"state";SPC(4);: NORMAL
 620 PRINT SPC(2);: INVERSE: PRINT SPC(2);"capital";SPC(2): NORMAL
 630 PRINT: PRINT: FOR x = lo TO hi
 640 PRINT " ";st$(x);SPC(15-LEN(st$(x)));
 650 PRINT cp$(x): NEXT
 700 VTAB 20: PRINT " [RETURN] = quiz on these"
 710 VTAB 22: PRINT " [ESCAPE] = back to menu"
 720 GET go$: IF go$ = CHR$(27) GOTO 500
 730 IF go$ <> CHR$(13) THEN  PRINT CHR$(7);: GOTO 720
1000 FOR quest = 1 TO 10
1010 q2 = INT(RND(1)*q1)+lo: IF st$(q2) = "used" GOTO 1010
1020 HOME: PRINT: PRINT " #";quest: PRINT: PRINT
1030 PRINT " What is the capital of": PRINT " ";st$(q2);"?"
1040 PRINT: PRINT: FOR x = 1 TO nb%
1050 du$(x) = cp$(x): NEXT: ff = FRE(0)
1060 cr = INT(RND(1)*5)+1: FOR x = 1 TO 5
1070 IF x = cr THEN  pt$ = cp$(q2): GOTO 1200
1080 q3 = INT(RND(1)*q1)+lo: IF q3 = q2 GOTO 1080
1090 IF du$(q3) = "taken" GOTO 1080
1100 pt$ = cp$(q3): du$(q3) = "taken"
1200 PRINT " ";x;"= ";pt$: NEXT x
1300 PRINT: PRINT: PRINT " select with number keys ..."
1310 PRINT: PRINT " ";
1320 GET ans$: ans% = VAL(ans$): IF ans$ = CHR$(27) THEN  RUN
1330 IF ans% < 1 OR ans% > 5 THEN  PRINT CHR$(7);: GOTO 1320
1350 INVERSE: PRINT ans$: NORMAL: PRINT: IF ans% = cr GOTO 1500
1400 PRINT " Sorry ... incorrect!!!": point = 0
1410 PRINT " ";cp$(q2);" is the capital."
1420 FOR x = 63 TO 43 STEP -1
1430 POKE 17954,x: PRINT CHR$(7);: NEXT
1440 POKE 17954,17: GOTO 1600
```

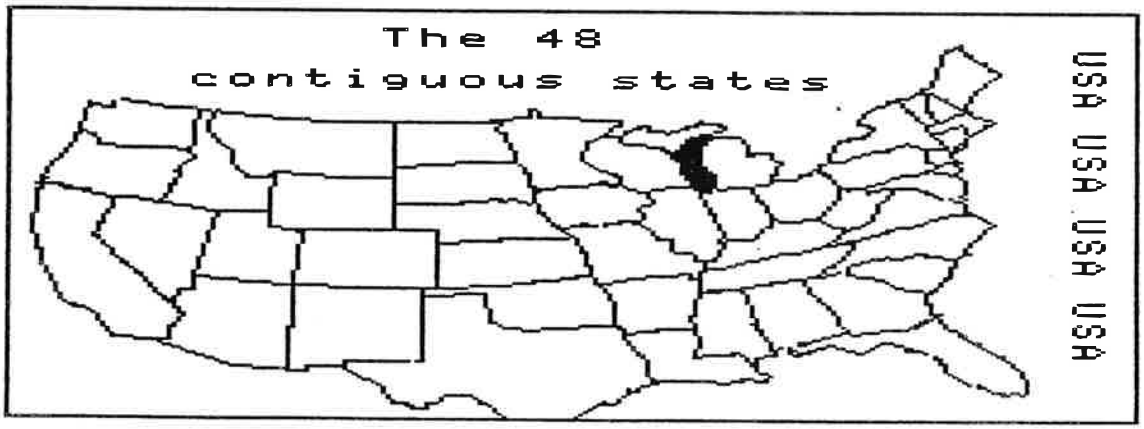
BASIC LIST continued from previous page ...

```
 1500 PRINT " Great!!!  That's right!!!"
 1510 point = 10: GOSUB 10100
 1600 score = score+point: perc = (score/quest)*10
 1610 PRINT: PRINT " ";perc;"% out of ";quest
 1620 PRINT: PRINT " press any key to continue ...";
 1630 st$(q2) = "used": GET go$: IF go$ = CHR$(27) THEN  RUN
 1640 NEXT quest: HOME: PRINT
 2000 INVERSE: PRINT " category: ";: NORMAL
 2010 PRINT " ";menu$(key%): PRINT
 2020 INVERSE: PRINT " correct:  ";: NORMAL
 2030 PRINT " ";score/10: PRINT
 2040 INVERSE: PRINT " missed:   ";: NORMAL
 2050 PRINT " ";10-score/10: PRINT
 2060 INVERSE: PRINT " grade:    ";: NORMAL
 2070 PRINT " ";perc: PRINT: PRINT: PRINT
 2080 INVERSE: PRINT " rating:   ": NORMAL
 2090 PRINT: PRINT " ";rate$(score/10)
 2100 IF perc < 90 GOTO 2200
 2110 FOR y = 1 TO 5: GOSUB 10100: NEXT
 2200 VTAB 22: PRINT " press any key to continue ...";
 2210 GET go$: RUN
 5000 DATA Alabama,Montgomery,Alaska,Juneau,Arizona,Phoenix
 5010 DATA Arkansas,Little Rock,California,Sacremento,Colorado,Denver
 5020 DATA Connecticut,Hartford,Delaware,Dover,Florida,Tallahassee
 5030 DATA Georgia,Atlanta,Hawaii,Honolulu,Idaho,Boise
 5040 DATA Illinois,Springfield,Indiana,Indianapolis,Iowa,Des Moines
 5050 DATA Kansas,Topeka,Kentucky,Frankfort,Louisanna,Baton Rouge
 5060 DATA Maine,Augusta,Maryland,Annapolis,Massachusetts,Boston
 5070 DATA Michigan,Lansing,Minnesota,St. Paul,Mississippi,Jackson
 5080 DATA Missouri,Jefferson City,Montana,Helena,Nebraska,Lincoln
 5090 DATA Nevada,Carson City,New Hampshire,Concord,New Jersey,Trenton
 5100 DATA New Mexico,Santa Fe,New York,Albany,North Carolina,Raleigh
 5110 DATA North Dakota,Bismarck,Ohio,Columbus,Oklahoma,Oklahoma City
 5120 DATA Oregon,Salem,Pennsylvania,Harrisburg,Rhode Island,Providence
 5130 DATA South Carolina,Columbia,South Dakota,Pierre,Tennessee,Nashville
 5140 DATA Texas,Austin,Utah,Salt Lake City,Vermont,Montpelier
 5150 DATA Virginia,Richmond,Washington,Olympia,West Virginia,Charleston
 5160 DATA Wisconsin,Madison,Wyoming,Cheyenne
 5500 DATA AL thru GA,HI thru MD,MA thru NJ
 5510 DATA NM thru SC,SD thru WY,exit the quiz
 5600 DATA you need a lot of practice,try studying the list
 5610 DATA practice!!!,think before you answer
 5620 DATA keep practicing,better luck next time
 5630 DATA practice makes perfect,not too bad
 5640 DATA looking good!!!,a very nice score!!!
 5650 DATA GREAT!!! -- A perfect score!!!
10000 TEXT: PRINT " program terminated.": POKE 16953,95: END
10100 FOR x = 15 TO 1 STEP -1
10110 POKE 17954,x: PRINT CHR$(7);: NEXT
10120 POKE 17954,17: RETURN
```




```
 10 REM draw arc of circle
100 HOME: x1 = 128: y1 = 80
110 pi = ATN(1)*4: radian = pi/180: rds% = 50
120 INPUT " enter begin angle (Ø-359): ";bg%
130 PRINT " enter ending angle (";bg%+1;"-359):";
140 INPUT " ";ed%
200 HGR: HCOLOR  = 7
210 FOR point = bg%*radian TO ed%*radian STEP radian
220 y2 = rds%*COS(point): x2 = rds%*SIN(point)
230 HPLOT x1+x2,y1-y2 TO x1,y1
240 NEXT point
```

```
 10 REM draw complete filled circle
100 HOME: INPUT " enter radius (5 - 57): ";rds%
110 x1 = 128: y1 = 80: REM center of screen
120 pi = 4*ATN(1): raian = pi/180
130 HGR: HCOLOR  = 14
140 FOR z = pi TO Ø STEP -radian
150 HPLOT x1+rds%*SIN(z),y1+rds%*COS(z)
160 HPLOT  TO x1-rds%*SIN(z),y1+rds%*COS(z)
170 NEXT z
```



BASIC 2.0 SPRITE BUGS:

Even though SmartBASIC 2.0 is a quantum leap forward from the interpreter that came with our ADAMs, it still has a small number of minor bugs. Two of these involve the same problem with the sprite commands.

In addition to the standard 192 possible vertical positions, ADAM's sprites can be located at two special vertical coordinates. A vertical position of 200 turns a sprite off. A vertical position of 208 turns that sprite off plus all the higher numbered (lower priority) sprites.

For instance, suppose you have all 32 sprites displayed on the screen. If you set the vertical coordinate of the second sprite to 208, all the sprites from the second to the thirty second will instantly disappear.

For some unknown reason 2.0 sets the default vertical position of all sprites to 208. This means that you have to make the sprites appear on the screen in numerical order; you can't simply turn on the twelfth sprite, for example. Here's how to correct the problem so that you can make the sprites appear in any sequence that you deem fit.

```
POKE 17229, 200: TEXT
```

Also, 2.0 won't let you set the vertical coordinate of a sprite to either of the two special positions. This makes it near impossible to remove a sprite once it's drawn. Here's how to correct this designer oversight.

```
POKE 11943, 200   (in STDMEM)
POKE 12454, 200   (in EXTMEM)
```

BASIC 2.0 SPRITE CONTROL:

SmartBASIC 2.0 cleverly uses the DRAW command to position sprites. Address 16788 is used as a flag byte. When its value is zero, the DRAW command can be used for normal hi-res shapes. When its value is NOT zero, the DRAW command is designated for sprite animation.

BASIC 2.0 comes with two default sprites: a sailboat and a Star Trek Enterprise. Each sprite design uses 32 bytes starting at address 192.

You can set your own sprite designs at any unused area of RAM. Addresses 16786 and 16787 are the low and high order byte pointers to the start of the sprite designs (or definitions). The default sprite table only has enough room for the two default sprites. If you want more sprites, you'll have to change the pointers. We'll go into more detail on sprite design next month.

The routine that controls the sprites uses addresses 25929 through 25996. You may find the sprites a little easier to work with if you use the HCOLOR correction (for SmartBASIC 2.0) mentioned last month.

That's enough of the fundamentals for now; let's get a sprite on the screen.

Be sure to correct the two sprite bugs first. You only have to do this once.

```
POKE 16788, 1   [RETURN]
(set DRAW flag byte)

HCOLOR = 7   [RETURN]
(set sprite color)

DRAW 1 AT 20,20   [RETURN]
(put #1 sprite on the screen)

DRAW 2 AT 100,100   [RETURN]
(put #2 sprite on the screen)

DRAW 1 at 20,200   [RETURN]
(remove #1 sprite from screen)

DRAW 1 at 20,40   [RETURN]
(put #1 back on screen)

DRAW 1 at 40,208   [RETURN]
(remove all sprites from screen)
```

This is a simple trick for instantly making all the sprites disappear. You should note though that you can't DRAW <u>any</u> sprites until you change that special vertical coordinate. Here's how to bring all the sprites back except the first one,

```
DRAW 1 at 40,200   [RETURN]
(put all back but #1)

DRAW 1 at 40,40   [RETURN]
(put #1 back on screen)
```

CHANGING SPRITE SIZE:

SmartBASIC 2.Ø includes a special algorithm at the end of the TEXT command routine that allows you to change the sprite magnification. Now that the two default sprites are on the screen, try this,

POKE 17339, 227: CALL 17330 [RETURN]
(instant sprite enlargement)

POKE 17339, 226: CALL 17330 [RETURN]
(return to standard sprite size)

You can use this trick in any graphics mode: TEXT, GR, HGR, and HGR2. You can preset the magnification, if you prefer. As you've seen, address 17339 is the default for the TEXT command.

Address 24902, contains the default value for the other graphics mode commands. For instance, you could POKE 24902, 227 to automatically get double magnification sprites when you execute an HGR command. However, the CALL at 17330 is the ONLY way to change the magnification once the sprites are on the screen (unless you write your own machine code routine).

You can set address 17339 to any of four values for sprite control. This algorithm simply sets the graphics selection for video register number one (as described in the August issue, page 14). The four values are:

POKE 17339, 224: CALL 17330
(small sprites, NO magnification)

POKE 17339, 225: CALL 17330
(small sprites, double magnification)

POKE 17339, 226: CALL 17330
(large sprites, NO magnification)

POKE 17339, 227: CALL 17330
(large sprites, double magnification)

Small sprites are designed in the same manner as ADAM's fonts are. Each small sprite requires eight bytes for the design. Large sprites, as we've discussed, must use 32 bytes for the shape definition. Here's how to change the sprite routine for selecting small or large sprites:

POKE 25992, 8 [RETURN]
(sets up for SMALL sprites)

POKE 25992, 32 [RETURN]
(sets up for LARGE sprites)

STATE CAPITAL QUIZ NOTES

The program on pages 1Ø and 11 presents an interesting application of TRUE randomization. It is a parallel of the Presidential Sequence Quiz in the October 1986 issue (page 11). You select the correct answer from the numbered multiple choices. It also features an automatic review screen for each of the five alphabetic groups of states.

It asks you to determine the correct capital for each state in a set of ten. There is no repetition of states. And TRUE randomization is employed (from the PatchWORK article in the October issue, page 24). As it stands, the program can only be used with SmartBASIC 1.Ø.

TRIGONOMETRIC GRAPHICS

(part 2)

In our premier issue we LISTed three programs that HPLOTted trig functions. The two programs on page 12 are a continuation of the concept.

The program at the top of the page draws the arc that you specify and draws a wedge to the center of the circle. This algoritm could be used in a program to create a pie chart of accounting figures.

The second program on page 12 draws a filled circle. One of the programs in the July issue did this also; but that program HPLOTted individual dots. The result was that gaps were left in the finished circle. This routine HPLOTs lines for a much more appealing result.

HACKER'S DELIGHT

PREVIOUS PROGRAM NOTES

In the October issue (page 24) we described a patch to the page zero interrupt routine. With this modification BASIC generates true randomization by continuously updating the RND pointer. This fix only works when the interrupt is enabled. That is, it updates the RND command only in the TEXT mode. The GR, HGR, and HGR2 modes disable the interrupt. This, however, is only a minor limitation.

The DATA/REM extra space patch from the November issue (page 12) has one minor limitation. As with SmartBASIC 2.Ø, the DATA statement MUST be the last command on a program line.

The new BASIC 1.Ø bootstrap routine from the November issue (page 13) works as is, but you may want to make a few changes. On line #5Ø2Ø of the program the second DATA element is a 224. This presents no problem as long as BASIC is booted immediately after SmartWriter. However, if you boot BASIC after some machine code programs, you'll have to pull the reset switch twice. To correct this, you can change that 224 to a 192.

On line #5Ø7Ø the second DATA element (the 25) sets the NORMAL screen color. You can change it to your preference.

On line #5Ø8Ø the second DATA element (the 244) sets the INVERE screen color. You can change it to your preference.

On line #51Ø0 the second DATA element (the 6) sets the BACKGROUND screen color. You can change it to your preference also.

Last month we revealed a patch that lets you switch between 4Ø column and 32 column TEXT modes. In normal 32 column TEXT mode you can use the standard three screen color POKE addresses. However, 4Ø column mode only supports two different colors, for the background and the fonts. Before executing the 4Ø column command you must ascertain that address 17Ø59 contains both a background AND a font color. Here's how:

```
POKE 17Ø59, ft*16 + bk
```

where 'ft' is the font color and 'bk' is the background color.

MORE PATCHES

This month we have two more patches to the interpreter (not for SmartBASIC 2.Ø). They are LISTed on page 17.

The one at the top of the page works for both SmartBASIC 1.Ø and Intel-BEST 3.3. It adds a powerful feature to the GOTO and GOSUB commands. It allows you to use a formula as the parameter or the standard absolute value.

It is similar to Ben Hinkle's fix. However, instead of changing the parameter routine, we just changed the pointer to the parameter routine. Now it uses the same parameter check that HTAB and VTAB do. Here's an example of how to use it.

```
1Ø xx = 1Ø
2Ø GOTO xx*5
3Ø PRINT "IT FAILED!!!"
5Ø TEXT: LIST: END
```

The other patch allows you to use the same principle with a relative RESTORE command. This way, you can set the DATA pointer to any line you choose. That alone is a powerful feature, but with the possibility of formula substitution also, you can have nonpareil control over your DATA.

This patch does have one drawback with SmartBASIC 1.Ø. It changes the RESTORE command. If you try to use RESTORE without a parameter, you'll get an error message.

Intel-BEST 3.3 already has a relative restore command (LINE). The patch at the bottom of page 17 just changes the first part of the LINE command to allow for formula substitution.

Here's how to use either command:

```
RESTORE INT(RND(1)*5)+15
or,
RESTORE 1ØØØ
(for SmartBASIC V1.Ø)

LINE x/1Ø+15
(for Intel-BEST 3.3)
```

COMING NEXT MONTH

Due to last minute editing we were forced to postpone the disassembly of the EOS system reset command till next month. We apologize for this inconvenience.

Also, this spacing problem disrupted the series on machine code data transfers. We WILL resume these two series of articles next month. Thank you for your patience.

GRAPHICS FONTS

The program on page 18 (plus nine lines on the top of page 19) shows you how to use ADAM's standard characters inside the high and low resolution graphics windows. No longer do you have to struggle with hi-res shape tables of fonts. This simple trick can add an entirely new dimension to your programs.

Each of ADAM's fonts uses eight bytes to construct the particular designs. Our program just transfers that 8-byte pattern definition from the table of fonts designs to the HGR or GR graphics window.

In HGR and GR modes the table of 96 fonts occupies addresses 13568 through 14336. To get a particular font's pattern address, just subtract 32 from its ASCII value and multiply that result times eight. Then add 13568 to that result. Then, convert that figure to high and low order bytes and use them with the EOS Read Table From VRAM routine. Line numbers 2030 through 2050 accomplish this.

Then, you just transfer that eight byte pattern back to the graphics area of VRAM. This process would be more simple if there were an EOS command for transferring data within VRAM. As it stands though, the bytes must be read from one area of VRAM into RAM. Then those bytes from RAM are POKEd back into a different area of VRAM.

The program also includes a nice feature that lets you stretch the length of a font to five times its standard size. This simply involves duplicating pattern bytes. You can stretch the fonts in width too, but this is a lot more complicated. It involves shifting the individual bits of every byte.

EZkeys

EZkeys makes an interesting change to the Elementary Operating System (EOS). It adds keyclick. There are four different tones plus a musical response for the [return] key.

It also adds a nice convenience for multi-drive users. You can change the current drive simply by pressing a SmartKEY. And, you can catalog a device by pressing SmartKEY 'V' (Roman numeral five).

Because you may want to use the SmartKEYS in your own programs, the routine includes an on/off toggle switch for the features. Here are the various functions:

CNTL+V: toggles features on/off

```
I   = POKE 16821, 8  (d1)
II  = POKE 16821,24  (d2)
III = POKE 16821, 4  (d5)
IV  = POKE 16821, 5  (d6)

V   = CATALOG
```

Address 64878 is used as a flag byte. When it is a 'one' the features are active. When it is a 'zero' the features are deactivated. The CNTL+V function just changes the value at 64878.

The BASIC program uses two self-tests to insure that you don't enter data incorrectly. Nonetheless, BE SURE TO STORE THE PROGRAM BEFORE RUNNING IT FOR THE FIRST TIME. If anything is incorrect the keyboard will lockup and you'll have to reboot BASIC. This EOS patch can add a very appealing touch to your programs -- it works in both immediate and programming modes.

The assembly language lists on pages 20 and 21 detail most of the patch. Please note that all numbers are in decimal this month.

```
 996 REM *** PatchWORK *** (1.Ø and 3.3)
 997 REM works with SmartBASIC V1.Ø and Intel-BEST 3.3
 998 REM *** formula branching enhancement
 999 REM for GOTO and GOSUB
1000 DATA Ø,Ø,Ø,205,3,39,77,68
1010 FOR x = 8342 TO 8349: READ mc: POKE x,mc
1020 POKE x+95,mc: NEXT
1030 POKE 277,231: POKE 286,231
```

```
   1 LOMEM :28000
  50 REM *** for SmartBASIC V1.Ø ONLY !!! ***
 100 REM *** PatchWORK ***
 110 REM >>> simple BASIC enhancements and fixes
1999 REM *** relative RESTORE with formula substitution
2000 DATA 205,3,39,77,68
2010 FOR x = Ø TO 4: READ mc: POKE x+1056,mc: NEXT
2020 DATA 237,67,79,63,205,240,48,210,184
2025 FOR x = Ø TO 8: READ mc: POKE x+1061,mc: NEXT
2030 DATA 32,34,245,62,175,50,249,62,201
2040 FOR x = 1070 TO 1078: READ mc: POKE x,mc: NEXT
2050 POKE 533,231
2500 POKE 6421+2*34,32: POKE 6422+2*34,4
```

```
   1 LOMEM :28000
  50 REM *** for Intel-BEST 3.3 ONLY !!! ***
  60 REM >>> execute Intel-BEST first <<<
 100 REM *** PatchWORK 3.3 ***
 110 REM >>> simple BASIC enhancements and fixes
1999 REM formula subtitution for LINE parameter
2000 DATA Ø,Ø,Ø,205,3,39,77,68
2010 FOR x = 1175 TO 1182: READ mc: POKE x,mc: NEXT
```

```
 10 REM HGR/GR graphics TEXT routine demonstration
 20 REM allows you to insert TEXT inside the graphics window
 30 REM this is a simple demo; doesn't include editing
 50 IF PEEK(259) <> 195 GOTO 550
100 LOMEM :28000: POKE 25471,17: ON PEEK(17008) = 2 GOTO 110: HGR
110 POKE 16149,255: POKE 16150,255
120 DATA 17,0,0,33,0,212,1,8,0,205,29,253,201
130 FOR x = 27600 TO 27612: READ m1: POKE x,m1: NEXT
140 p1 = 27600: p2 = p1+1: p3 = p1+2: p4 = p1+4: p5 = p1+7: p6 = p1+10
150 ht% = 1: vt% = 1: fs% = 1: cf = 1: cb = 7
160 FOR x = 0 TO 15: POKE 18765+x,x: POKE 18781+x,x: NEXT
500 HOME: PRINT " 1 = change controls"
510 PRINT " 2 = enter text"
520 PRINT " 3 = exit program"
530 GET m1$: m1% = VAL(m1$): IF m1% < 1 OR m1% > 3 GOTO 530
540 ON m1% GOTO 1000,2000,550
550 HOME: PRINT " program terminated.": END
1000 HOME: PRINT " 1 = change screen postion"
1010 PRINT " 2 = change font size"
1020 PRINT " 3 = change colors"
1030 PRINT " 4 = goto main menu";
1040 GET m2$: m2% = VAL(m2$): IF m2% < 1 OR m2% > 4 GOTO 1040
1050 HOME: ON m2% GOTO 1200,1400,1600,500
1200 INPUT " enter HTAB: ";ht%
1210 IF ht% < 1 OR ht% > 31 GOTO 1200
1220 INPUT " enter VTAB: ";vt%
1230 IF vt% < 1 OR vt% > 20 GOTO 1220
1240 GOTO 1000
1400 PRINT " enter font length factor"
1410 INPUT " (1 - 5): ";fs%
1420 IF fs% < 1 OR fs% > 5 GOTO 1410
1430 GOTO 1000
1600 INPUT " foreground color? ";cf
1610 IF cf < 1 OR cf > 15 GOTO 1600
1620 INPUT " background color? ";cb
1630 IF cb < 1 OR cb > 15 GOTO 1620
1640 GOTO 1000
2000 HOME: INPUT " enter your text: ";tx$
2005 tx% = LEN(tx$)
2010 FOR x = 1 TO tx%: ta = ASC(MID$(tx$,x,1))
2020 IF ta < 32 OR ta > 127 THEN  ta = 32
2030 ta = ta-32: tb = ta*8+13568: za% = tb/256: zb% = tb-256*za%
2040 REM read the bit mapped font
2050 POKE p2,zb%: POKE p3,za%: POKE p5,8: POKE p6,29: CALL p1
2100 IF fs% = 1 GOTO 2150
2110 FOR y = 7 TO 0 STEP -1: pk = PEEK(y+54272)
2120 FOR z = fs%-1 TO 0 STEP -1
2130 POKE y*fs%+54272+z,pk: NEXT z: NEXT y
2150 POKE p2,ht%*8: POKE p3,(vt%-1)+32: POKE p6,26: CALL p1
2160 POKE p3,PEEK(p3)-32: FOR w = 54272 TO 54279
2170 POKE w,cf*16+cb: NEXT
2180 CALL p1: POKE p3,PEEK(p3)+32
```

```
2200 ht% = ht%+1: IF ht% > 31 THEN  ht% = 1: vt% = vt%+1*fs%
2205 IF fs% = 3 AND vt% > 18 THEN  vt% = 1
2210 IF vt% > 20 THEN  vt% = 1: IF fs% = 3 AND vt% > 6 THEN  vt% = 1
2220 IF fs% = 1 GOTO 2300
2230 FOR z = 2 TO fs%: POKE p3,PEEK(p3)+1
2240 POKE p4,(z-1)*8: CALL p1
2250 POKE p3,PEEK(p3)-32: POKE p4,0: CALL p1
2260 POKE p3,PEEK(p3)+32: NEXT z
2300 NEXT x: GOTO 500
```

```
8000 REM EZkeys (EOS input mod)
8010 REM can be merged with PatchWORK 1.0 or 3.3
8020 REM ie, it works with SmartBASIC 1.0 and Intel-BEST 3.3
8030 REM CNTL+V = toggle keyclick/functions
8040 REM I   = POKE 16821,8
8050 REM II  = POKE 16821,24
8060 REM III = POKE 16821,4
8070 REM IV  = POKE 16821,5
8080 REM V   = CATALOG (current device)
8100 POKE 16149,255: POKE 16150,255: POKE 64878,1
8110 DATA 205,134,251,245,58,117,253,254,22,32,24
8120 DATA 58,110,253,254,1,40,4,62,1,24,1,175,50,110,253
8130 DATA 241,209,193,241,175,50,117,253,201
8140 DATA 58,110,253,254,1,40,4,241,209,193,201
8150 DATA 58,117,253,254,160,48,245,254,13,40,118
8160 DATA 254,32,56,237,6,8,254,64,56,2,6,16
8170 DATA 254,96,56,2,6,24,254,128,56,2,6,32
8180 DATA 62,192,211,224,120,211,224,62,210,211,224
8190 DATA 17,0,7,27,122,179,32,251,62,223,211,224
8200 DATA 58,117,253,254,129,32,4,62,8,24,22
8210 DATA 254,130,32,4,62,24,24,14,254,131,32,4,62,4,24,6
8220 DATA 254,132,32,7,62,5,50,181,65,24,24
8230 DATA 254,133,32,21,241,209,193,241,175,50,117,253
8240 DATA 205,96,47,205,152,82,205,162,82,195,166,62
8260 DATA 241,241,209,193,175,50,117,253,201
8270 DATA 62,201,50,154,248,6,20,205,131,248,5,16,250
8280 DATA 62,58,50,154,248,24,228
8290 DATA -1
8300 start = 63538: tot = 0
8310 READ mc: IF mc = -1 GOTO 8330
8320 POKE start,mc: tot = tot+mc: start = start+1: GOTO 8310
8330 IF start = 63733 AND tot = 23546 GOTO 8500
8400 PRINT: PRINT: PRINT " data entry error!!!"
8410 PRINT " please check your data.": END
8500 DATA 62,195,50,218,244,33,50,248,34,219,244,201
8510 FOR x = 54272 TO 54283: READ mc: POKE x,mc: NEXT
8520 IF PEEK(54283) <> 201 THEN  PRINT " data error on line 8500!": END
8530 CALL 54272
```

TITLE (asmb#29):

EZkeys
(TURN ON or OFF)

addr	Label:	Decimal value:	Op Code:	Comment:
63538	ReadKB	205, 134, 251,	CALL 64390	; continue keyboard read
63541	CHECK	245,	PUSH AF	; store current keypress
63542		58, 117, 253,	LD A,(64885)	; get last keypress
63545		254, 22,	CP 22	; check for CNTL+V
63547		32, 24,	JR NZ,24	; if not, goto STATUS
63549		58, 110, 253,	LD A,(64878)	; get status byte
63552		254, 1,	CP 1	; check if ON
63554		40, 4,	JP Z,4	; if ON, goto OFF
63556	ON	62, 1,	LD A,1	; load ON value
63558		24, 1,	JPR 1	; skip OFF
63560	OFF	175,	XOR A	; set OFF value
63561	SET	50, 110, 253,	LD (64878),A	; set status byte
63564	DONE1	241,	POP AF	; retrieve keypress
63565		209,	POP DE	; get last DE
63566		193,	POP BC	; get last BC
63567		241,	POP AF	; ignore keypress
63568		175,	XOR A	; reset accumulator
63569		50, 117, 253,	LD (64885),A	; reset input byte
63572		201,	RET	; RETurn from routine

TITLE (asmb#3Ø):

EZkeys
(INCOMING STATUS CHECK)

addr	Label:	Decimal value:	Op Code:	Comment:
63573	STATUS	58, 110, 253,	LD A,(64878)	; get status byte
63576		254, 1,	CP 1	; check status byte
63578		40, 4,	JR Z,4	; if ON, goto SCAN
63580	DONE2	241,	POP AF	; retrieve keypress
63581		209,	POP DE	; get last DE
63582		193,	POP BC	; get last BC
63583		201,	RET	; RETurn from routine

TITLE (asmb#31):

EZkeys
(SCREEN INPUT VALUE)

addr	Label:	Decimal value:	Op Code:	Comment:
63584	SCAN	58, 117, 253,	LD A,(64885)	; get last keypress
63587		254, 160,	CP 160	; check upper range
63589		48, 245,	JR NC,245	; if >=160 then DONE2
63591		254, 13,	CP 13	; check [return] key
63593		40, 118,	JR Z,118	; if 13 then MUSIC
63595		254, 32,	CP 32	; check lower range
63597		56, 237,	JR C,237	; if <32 goto DONE2
63599		6, 8,	LD B,8	; set tone = 8
63601		254, 64,	CP 64	; check range 2
63603		56, 2,	JR C,2	; if <64 skip 2 bytes
63605		6, 16,	LD B,16	; set tone = 16
63607		254, 96,	CP 96	; check range 3
63609		56, 2,	JR C,2	; if <96 skip 2 bytes
63611		6, 24,	LD B,24	; set tone = 24
63613		254, 128,	CP 128	; check range 4
63615		56, 2,	JR C,2	; if <128 skip 2 bytes
63617		6, 32,	LD B,32	; set tone = 32

TITLE (asmb#32):

EZkeys
(EXECUTE CATALOG)

addr	Label:	Decimal value:	Op Code:	Comment:
63680	CATLG	254, 133,	CP 133	; check if 'V'
63682		32, 21,	JR NZ,21	; if not 'V' then DONE4
63684	DONE3	241,	POP AF	; retrieve last keypress
63685		209,	POP DE	; get last DE
63686		193,	POP BC	; get last BC
63687		241,	POP AF	; ignore keypress
63688		175,	XOR A	; set acc= to zero
63689		50, 117, 253,	LD (64885),A	; reset input byte
63692		205, 96, 47,	CALL 12128	; print a [return]
63695		205, 152, 82,	CALL 21144	; reset file byte counter
63698		205, 162, 82,	CALL 21154	; display catalog
63701		195, 166, 62,	JP 16038	; goto BASIC control loop

GETTING INTO CP/M 2.2

THE CONFIG COMMAND

The CP/M disk includes a special transient command called CONFIG. With this feature you can customize (or configure) certain aspects of the CP/M disk. Let's experiment with it.

1. Boot CP/M 2.2
(insert medium and pull reset)
(be SURE to ONLY use a backup)

2. type CONFIG [RETURN]
(this will load the CONFIG command)

Now that CONFIG is in memory, you'll see six numbered options. Let's make some changes.

First, press #2 (Read Tables From Drive). When asked for the drive label, just press the 'A' key and hit [RETURN].

When the drive stops spinning, select option #6 (Edit Tables). Now press option #3 (Smart Key Menu) from the list of Editable Features.

Press #2 (Change Smart Key I). Be EXTREMELY CAREFUL in typing the letters as you enter the Return String. This is the function that will be EXECUTED when SmartKEY I is pressed. Type this:

DIR [RETURN] [CNTL+DELETE]

This will make SmartKEY I automatically insert a RETURN after it prints the DIR command.

Now enter the Text String. This is the information that will be displayed beneath the SmartKEY label. It consists of two lines of text. Type this:

Press the space bar once, then
DIR [CNTL+DELETE]
Now press the space bar ONCE again, then
RET [CNTL+DELETE]

Next, you're asked to select the color (blue or yellow). You only have to enter the first letter. Enter this:

B [RETURN]

Now, you'll be returned to the Smart Key Menu. From here, select option #1 (Return to Edit Menu).

From the list of Editable Features, select #5 (Cursor Changes). Here, select option #2 (Change Color).

Now the 16 possible selections are listed by hexadecimal numbers. Choose '1', black. As soon as you press [RETURN], you'll be sent back to the Cursor Change Menu.

From here, select option #3 (Change Cursor Graphics). This will allow you to change the cursor's design from an underscore to your own creation.

This is accomplished through a technique known as 'bit mapping'. Each character is designed in a matrix of eight dots across by eight dots down. When a dot is turned on, it has a value of one. When it is off, it has a value of zero. In designing your own cursor, you just decide which dots to have on or off by typing one's and zero's on the keyboard.

The easiest cursor to create is a solid box. All you do is type eight one's, eight times. As soon as you enter the last digit, CONFIG returns you to the Cursor Change Menu. From here, select option #1 (Return to Edit Menu).

We'll experiment a little more with CONFIG next month. For now, select option #1 (Return To Main Menu). This is where you started from.

Now, select option #4 (Write Tables to Drive). When asked, just enter 'A' again for the drive and then press [RETURN].

When the customized information is transferred to the CP/M 2.2 backup, you'll see a message. It is, "Tables Written Successfully".

Now, let's take a look at the changes you made. Pull the computer reset switch (to reboot CP/M).

Can you determine the changes? Every time you boot this particular CP/M disk or data pack, your customized features will be in effect.

ADAM PRODUCT REVIEWS

PRODUCT:	SmartTYPE
MANUFACTURER:	REEDY SOFTWARE
MEDIA TYPE:	datapack/disk
GRAPHICS/SOUND/DESIGN:	98
INSTRUCTIONS:	99
USEFULNESS vs PRICE	97
RECOMMENDATION:	highly recommended
PRICE:	$24.95 ddp/$22.95 disk
RATED BY:	Pat Herrington
	Apopka, FL 32709

SmartTYPE may sound like a typing tutor, but actually it is a little gem of a word processor. It is cleverly designed, auto-loading and menu-driven, making full use of the Smart Keys. The instruction manual is clear and thorough.

If you already have two or three perfectly good word processing programs, do you really need SmartTYPE? Well, that depends. If all your work is in letter form, probably not. But if you ever like to work in two-column format, then you can't afford to be without SmartTYPE.

Any word processor will allow you to format in two columns, as long as you don't want to make any major changes. The problems arise when you try to edit. You can't insert or delete lines without garbling the page or leaving blank lines. If you've ever tried this, you know how frustrating it can be. The strength of SmartTYPE is that it works with half a line at a time; you can insert or delete lines from either the left column or the right column without disturbing anything else. While you're at it, you can format individual lines in each column. You can choose to justify left or right, center the line, or use left AND right justify, as the newspaper does. No other program for the ADAM will do this. Other nice features: You can move to any line without scrolling, and you can choose to print only a portion of the text. Unlike some programs, SmartTYPE supports bi-directional printing.

Some caveats: SmartTYPE is designed for short files on "fresh" media. In two-column mode, you work with a page at a time. Editing rows can cause "ghost" characters to appear, changing letters of text. They are easy to spot because they are a different color; simply change them back. The only real drawback is that SmartTYPE will not underscore; you must capitalize or use dashes for emphasis.

REEDY SOFTWARE is very supportive of its customers -- a big plus for the novice or those with special printers. REEDY delivers what it promises.

PRODUCT:	Jeopardy Question Pack
MANUFACTURER:	Walters Software
MEDIA TYPE:	DDP/disk
GRAPHICS/SOUND/DESIGN:	N/A
INSTRUCTIONS:	N/A
USEFULNESS vs PRICE	95
RECOMMENDATION:	highly recommended
PRICE:	$19.95
RATED BY:	N&B staff

This is the ideal package for those who have the public domain volume Jeopary (unreleased Coleco title). After booting Jeopardy, you just select the 'using a question pack' option. Then, insert this medium and select the drive. Jeopardy will access this question pack instead of the default 26 screens.

There are two minor points to consider with this welcome alternative set of questions. This pack is not as lenient with spelling errors as the original questions are. And, the questions tend to slant toward history and sports; although, there are a variety of question categories. If you like playing Jeopardy, this question pack is certainly worth considering as an addition to your software library.

PRODUCT:	KID'S TRIVIAPAK I
MANUFACTURER:	Mr. T. Software
MEDIA TYPE:	DDP/disk
GRAPHICS/SOUND/DESIGN:	98
INSTRUCTIONS:	93
USEFULNESS vs PRICE	95
RECOMMENDATION:	highly recommended
PRICE:	$19.ØØ
RATED BY:	N&B staff

KID'S TRIVIAPAK I is just as fun to play as TRIVIAPAK I. And, the questions are notably easier, though not entirely simple. This software uses color and sound very nicely and controls user input professionally.

This package contains 1ØØØ questions (9 sets of 12Ø questions) in 6 categories. The categories are: SCIENCE & NATURE, SPORTS & GAMES, MUSIC & STAGE, PEOPLE & PLACES, THE MOVIES, and TELEVISION.

One to four players (or groups) are allowed. When you answer a question correctly, ADAM marks that category. When all six categories are marked, you get to choose your WINNING CATEGORY. The first player to answer this final question correctly gets to put his/her name in the HALL OF FAME as the game winner.

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The most comprehensive graphics design software ever written for ADAM™,

The most amazing aspect of ShowOFF I is the power that you control. This is one piece of software that really taps into ADAM's potential.

It includes two primary programs, BlockPAINT 2.3 and SmartPAINT. BlockPAINT 2.3 is a specially enhanced version of the program we LISTed in our September issue. The newer version is fully compatible with files created by version 1.7. And, you can PRINT the low resolution graphics screens on the ADAM printer or your compatible dot matrix printer -- directly from within BlockPAINT.

The prize of this package is SmartPAINT, the high resolution graphics design program. You have 41 paint brushes and 14 colors to choose from. It will automatically draw circles, triangles, quadrangles, and lines for you. It even includes an automatic pen movement option.

SmartPAINT gives you two automatic border selections. You have access to a FAST full screen TEXT editor -- put text right next to your graphics. All 94 standard fonts are included, plus 24 special characters and symbols. You can even rotate any of the characters or paint brushes.

Several powerful color options are included. The monochromatic option instantly converts the entire drawing to your specified color. The inverse monochromatic option instantly changes all foreground colors to black and the background to the color of your choice. Another option will instantly change the background screen to your preference without changing any other colors. Still another option, allows you to instantly change all of one color to the new color of your choice.

Of course, both BlockPAINT and SmartPAINT include SAVE and LOAD picture options. And, both support any Epson FX compatible impact dot matrix printer (like the Panasonic KX series). The printer can be connected to ADAM via either the Orphanware PIA2 or the Eve Electronics SP-1. We'll even modify the graphics printing part of the program for any printer connected to either interface.

Our graphics in this issue were printed with SmartPAINT. With the extensive, easy to follow instruction manual you can begin creating impressive graphics in hardly no time at all!

There are even a few BONUSes. The package includes a patch to PaintMASTER (by STRATEGIC SOFTWARE) which allows you to convert its files to SmartPAINT format. You can even use your own graphics created independent of SmartPAINT. And, you can use SmartPAINT pictures in your own programs.

Don't miss out on this one. It's destined to be a bestseller. The standard non-subscriber price is only $29.95. NIBBLES & BITS subscribers can get it (on DDP or disk) for only $24.95. Get ShowOFF I today ... and show off your ADAM™. ShowOFF I is a DIGITAL EXPRESS product.

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Here's how to get a volume FREE. (1) Contribute an original program for the particular library. (2) Send a signed statement that the program is NOT copyrighted. (3) Send the program on DDP or disk; one DDP or disk for each volume that you want in return. (4) Request the specific volume that you want in exchange. And, (5) include a return mailer with sufficient postage or send $2.5Ø for shipping costs.

SmartBASIC V1.Ø 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&Bgames Ø1: An assortment of text adventures, board games, and animation games -- 13ØK of files.

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SmartBASIC 2.Ø: 49K program.

Pinball Construction/ Hardhat Mac: Best of Electronic Arts.

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Troll's Tale: Disk and DDP version NOT compatible with this adventure.

CP/M 2.2 Library:

CP/M games Ø1: 3Ø games.

CP/M games Ø2: 25 games.

Test/Music: System tester and hodgepodge of music samples (requires 64K expander) -- from an unreleased Coleco cartridge program.

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