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All of the Adventures in this ad are in Basic. They are full featured, fully plotted adventures that will take a minimum of thirty hours (in several sittings) to play.

Adventuring requires 16k on Sinclair, TRS-80, and TRS-80 Color. They require 8k on OSI and 13k on VIC-20. Sinclair requires extended BASIC.

TREK ADVENTURE by Bob Retelle — This one takes place aboard a familiar starship and is a must for trekkies. The problem is a familiar one — The ship is in a "decaying orbit" (the Captain never could learn to park!) and the engines are out (You would think that in all those years, they would have learned to build some that didn't die once a week). Your options are to start the engine, save the ship, get off the ship, or die. Good Luck.

Authors note to players — I wrote this one with a concordance in hand. It is very accurate — and a lot of fun. It was nice to wander around the ship instead of watching it on T.V.

CIRCLE WORLD by Bob Anderson — The Alien culture has built a huge world in the shape of a ring circling their sun. They left behind some strange creatures and a lot of advanced technology. Unfortunately, the world is headed for destruction and it is your job to save it before it plunges into the sun!

Editors note to players — In keeping with the large scale of Circle World, the author wrote a very large adventure. It has a lot of rooms and a lot of objects in them. It is a very convoluted, very complex adventure. One of our largest. Not available on OSI.

HAUNTED HOUSE by Bob Anderson — This one is for the kids. The house has ghosts, goblins, vampires and treasures — and problems designed for the 8 to 13 year old. This is a real adventure and does require some thinking and problem solving — but only for kids.

Authors note to players — This one was fun to write. The vocabulary and characters were designed for younger players and lots of things happen when they give the computer commands. This one teaches logical thought, mapping skills, and creativity while keeping their interest.

DERELICT by Rodger Olsen and Bob Anderson — For Wealth and Glory, you have to ransack a thousand year old space ship. You'll have to learn to speak their language and operate the machinery they left behind. The hardest problem of all is to live through it.

Authors note to players — This adventure is the new winner in the "Toughest Adventure at Aardvark Sweepstakes". Our most difficult problem in writing the adventure was to keep it logical and realistic. There are no irrational traps and sudden senseless deaths in Derelict. This ship was designed to be perfectly safe for its' builders. It just happens to be deadly to alien invaders like you.



NUCLEAR SUB by Bob Retelle — You start at the bottom of the ocean in a wrecked Nuclear Sub. There is literally no way to go but up. Save the ship, raise her, or get out of her before she blows or start WWII.

Editors note to players — This was actually plotted by Rodger Olsen, Bob Retelle, and someone you don't know — Three of the nastiest minds in adventure writing. It is devious, wicked, and kills you often. The TRS-80 Color version has nice sound and special effects.

EARTHQUAKE by Bob Anderson and Rodger Olsen — A second kids adventure. You are trapped in a shopping center during an earthquake. There is a way out, but you need help. To save yourself, you have to be a hero and save others first.

Authors note to players — This one feels good. Not only is it designed for the younger set (see note on Haunted House), but it also plays nicely. Instead of killing, you have to save lives to win this one. The player must help others first if he/she is to survive — I like that.

PYRAMID by Rodger Olsen — This is one of our toughest Adventures. Average time through the Pyramid is 50 to 70 hours. The old boys who built this Pyramid did not mean for it to be ransacked by people like you.

Authors note to players — This is a very entertaining and very tough adventure. I left clues everywhere but came up with some ingenious problems. This one has captivated people so much that I get calls daily from as far away as New Zealand and France from bleary eyed people who are stuck in the Pyramid and desperate for more clues.

QUEST by Bob Retelle and Rodger Olsen — THIS IS DIFFERENT FROM ALL THE OTHER GAMES OF ADVENTURE!!!! It is played on a computer generated map of Alesia. You lead a small band of adventurers on a mission to conquer the Citadel of Moorlock. You have to build an army and then arm and feed them by combat, bargaining, exploration of ruins and temples, and outright banditry. The game takes 2 to 5 hours to play and is different each time. The TRS-80 Color version has nice visual effects and sound. Not available on OSI. This is the most popular game we have ever published.

MARS by Rodger Olsen — Your ship crashed on the Red Planet and you have to get home. You will have to explore a Martian city, repair your ship and deal with possibly hostile aliens to get home again.

Authors note to players — This is highly recommended as a first adventure. It is in no way simple—playing time normally runs from 30 to 50 hours — but it is constructed in a more "open" manner to let you try out adventuring and get used to the game before you hit the really tough problems.



ADVENTURE WRITING/DEATHSHIP by Rodger Olsen — This is a data sheet showing how we do it. It is about 14 pages of detailed instructions how to write your own adventures. It contains the entire text of Deathship. Data sheet - \$3.95. NOTE: Owners of OSI, TRS-80, TRS-80 Color, and Vic 20 computers can also get Deathship on tape for an additional \$5.00.

PRICE AND AVAILABILITY:

All adventures are \$14.95 on tape except Earthquake and Haunted House which are \$9.95. Disk versions are available on OSI and TRS-80 Color for \$2.00 additional.

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A Carefully Designed Sound

Locations \$0314 and \$0315 contain the address (hexadecimal, low byte and high byte) of the normal Interrupt Request entry point. These are modified by the program to point at the start of the VIC Ringer.

A great deal of attention was given to the actual bell subroutine. The bell had to be noticeable, but not objectionable. The low voice of the VIC-20 was used (location \$900A), but it is used in its very highest range. To make the bell stand out, it is made to go through a series of tones quite rapidly. The result is a "tweedle-tweedle" sound not unlike the bell in a Commodore CBM-8032.

The bell subroutine has been written so that if the programmer is already using the various voices for something, he won't tamper with their amplitudes. The value in location \$900E which specifies the volume or amplitude of the voices is pushed into the stack and saved. This value is restored when the bell is through ringing. This helps make the VIC Ringer transparent to the computer. Just load it and forget about it!

The program is written as a BASIC loader. This loader automatically compensates for any memory attachments, making the program suitable for VICs with any amount of memory. In addition,

the SYS command in line number 300 initializes the program. So, you can use the quick load feature (shift [RUN] key) to put the VIC Ringer into memory.

The location at which the bell rings can be modified, if desired, by changing the 80 in line 330 to any number between 0 and 88. Most typewriters ring when they're five spaces from the end. If this is desired, change the number to 83.

```

200 PRINT"WAIT A FEW MOMENTS..."
210 T=256*PEEK(56)+PEEK(55):X=T-1
220 GOSUB 310:T(1)=L:T(2)=H%
230 X=T-71
240 GOSUB 310:T(3)=L:T(4)=H%
250 POKE 55,T(3):POKE 56,T(4)
260 FORA=T-84TOT-1
270 READD$:IFLEFT$(D$,1)="T"THENS=VAL(RIGHT$(D$,1)):D=T(S):GOTO290
280 D=VAL(D$)
290 POKEA,D:NEXT
300 SYS(T-84):NEW
310 H%=X/256:L=X-256*H%:RETURN
320 DATA120,169,T3,141,20,3,169,T4,141,21,3,88,96,72,138,72
330 DATA152,72,165,211,208,5,162,248,142,T1,T2,201,80,208,44,173
340 DATAT1,T2,240,39,173,14,144,72,169,15,141,14,144,173,T1,T2
350 DATA41,254,141,10,144,162,16,160,255,136,208,253,202,208,248,238
360 DATAT1,T2,208,233,142,10,144,104,141,14,144,104,168,104,170,104
370 DATA76,191,234,170
  
```

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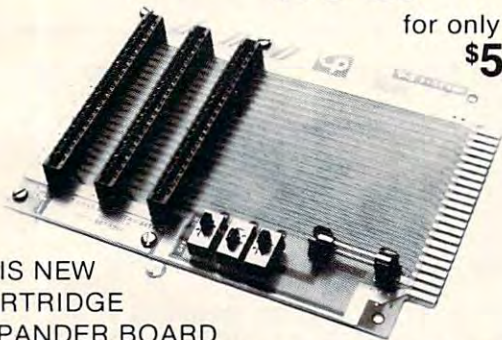
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Mysterious and even disastrous effects can result from improperly CLOSED PET/CBM files. This utility provides a convenient way to avoid these problems.

Is Anyone Open?

Elizabeth Deal
Malvern, PA

It is sometimes important to know which files on the PET have not been closed. The simplest way to find the file status is by asking the PET's machine language monitor, but you have to type error-prone inquiries. I got tired of this and adopted Mike Louder's "dynamic keyboard" routine to do the typing for me. The listing in lines 2000-2070 contains the routine. Users of BASIC 4 equipment must substitute SYS 54386 in lines 2050 and 2070. Line 2070 is important - it does the job.

Enter the code and execute by GOTO2000 or RUN. The program will print the desired inquiries, will "press" RETURN several times, and will display the data on the screen. There is one extra carriage

return stuffed in to re-enable Power. [A BASIC-enhancement program sold by Professional Software.] On Power-less systems the cursor will land one line too low. If this bothers you, change J-loop index M from 5 to 4. The display looks like you are in the monitor, but you are not. When all is done, you land safely back in BASIC. If you choose to modify the monitor display, placing the cursor over the SYS command and hitting RETURN will re-enter the monitor.

The display consists of three parts:

1) On the \$00D1 line the PET recalls the file it worked with most recently. \$D1 contains length of file name, \$D2 contains file number, \$D3 contains the secondary address or, in the case of tapes, the read/write flag, and \$D4 contains the device number. You can also go after the file name in 4, but in Upgrade, PET's PRINT commands obliterate the data.

2) On the \$00AE line we see PET's count of the number of active files. If you typed RUN or CLR; if no files were open; if you modified the program; or if you did anything that makes your PET think you modified a program - this value will be zero, hence useless to us. If it is not a zero, it is meaningful.

(3) Locations \$0251-026F contain the table of files. The first ten values are logical file numbers, the middle ten are device numbers, and

the last ten are coded secondary addresses. If the secondary address is \$FF, disregard it. Otherwise, subtract \$60 (96 dec) to get the secondary address. These values usually remain in the PET. PET considers them irrelevant if \$AE contains zero. (You may change \$AE to re-enable access to the files.) Otherwise, these are our OPEN files. As you CLOSE them, \$AE decreases by one and the display shifts to the left, always leaving a set of data in memory.

A CLOSE Option

For users who prefer not to read the information in hex, BASIC lines 2100-2250 do the same job. Additionally, this routine POKes a count of "possibly" open files into 174, so that you may CLOSE them. Needless to say, if you don't plan to close anything, you make POKE location 174 with zero; otherwise, the PET will not let you open an already active file.

There is circularity built into the routine: even if you just did CLOSE5, 5 will still be displayed. Disregard it. The purpose of the routine is to provide as much information as possible; it is up to you to use it with some thought.

The key reason for this exercise is the fact that files must be closed. If they are not, the final piece of information cannot be written. In the case of tape files, it's inconvenient. In the case of floppy files, it could lead to the disaster of losing other information already on the disk (especially if you plan to use a scratch command). It's easy to have some unclosed files dangling around – a disk error, a program error, or use of the STOP key may not allow the files to be properly closed. In direct mode, of course, an aborted SAVE command leaves an asterisk behind, meaning unfinished writing, an invitation to trouble that should be corrected immediately.

Some kinds of trouble may not show up for some time. A directory can look pretty good (though blocks free may tell you something), but when you attempt to bring a program in, for instance, it may look pretty weird (the same way as when you write a disk with a non-unique ID).

In any case, the usual procedure for handling such problems is to VALIDATE (COLLECT in 4.0 BASIC) the disk. That's a time-consuming nuisance if a disk is pretty full. It must be used in case of unfinished SAVEing. But we can skip VALIDATE by using the data provided by the above routine(s). With such an amount of displayed information, you're bound to be able to recognize which files are really OPEN and which have been closed. It often makes no difference that you know it, since it is all right to CLOSE an already closed file (hence you

can close them in a jiffy in a loop). But if you don't want to touch some device, a selective CLOSE is handy.

```

2000 REM * DYNAMIC MLM FILES DISPLAY
2010 PRINT"{05 DOWN}.M 00D1 00D1"
2020 PRINT"{DOWN}.M 00AE 00AE"
2030 PRINT"{DOWN}.M 0251 026F"
2040 PRINT"{04 DOWN}.X"
2050 PRINT"{15 UP}SYS64785"
2060 M=5:POKE158,M:FORJ=0TOM
2070 POKE623+J,13:NEXT:SYS64785
2090 :
2100 REM * FILE STATUS DISPLAY
2110 F1=174:F2=210:F3=593:F5=PEEK(F2)
2120 F4=PEEK(F1):IFF4=0THENF4=10
2130 PRINT" F# DN SA";:F6=0:F7=0
2140 : FORI=F4-1TO0STEP-1:F5=" "
2150 F4=PEEK(F3+I):REM FILE#
2160 IFF4=F7ORF4=255GOTO2220
2170 F6=F6+1:F7=F4:IFF4=F5THENF5="**"
2180 PRINT:PRINTF5;:GOSUB2240
2190 F4=PEEK(F3+10+I):GOSUB2240:REM DEVICE
2200 F4=PEEK(F3+20+I):REM SEC ADDRESS
2210 IFF4<>255THENF4=F4-96:GOSUB2240
2220 : NEXTI:PRINT
2230 POKEF1,F6:RETURN:ACTIVATE FILES
2240 PRINTRIGHT$(" "+STR$(F4),4);
2250 RETURN

```

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For Apple, PET/CBM, VIC — this ripple sort will sort records using any internal location as its key. For example, R. J. Brown can be alphabetized starting at the "B" in Brown and ignoring "R. J."

SORTING BY FIELDS

Rick Keck
Overland Park, KS

Occasionally computer users need to sort data in a special way. Several sort routines are available, however most do not allow the flexibility of sorting data by fields. The program with this article illustrates a different type of application for a sort routine. The sorting algorithm used in this example is a ripple sort. The code as shown will work on either a Commodore or an Apple computer. Specifically, this program demonstrates a sorting routine which allows sorting of a file of string records by a user-specified field.

Observe the ten data statements at the top of the program noting that each record consists of three fields of data. It is essential that these fields start at a specified column in each of the records so that the file is consistent in its construction. In this case, the following fields start at the stated columns in each record in the file.

Field (1): Name - column 1
Field (2): Number - column 11
Field (3): Code - column 21

With this program the user responds to a computer request by stating which column position the file of records is to be sorted by. The important factors which contribute to the ability to sort the file by a field are as follows: First, each record consists of a large, single string of data. Second, the utilization of the MID\$ function in the sorting section of the program allows comparison of a substring of each record.

This sorting program can be made into a subroutine and inserted into an existing program by doing the following. Delete lines 10 through 230; renumber the code as desired; replace the END statement with a RETURN statement; and call the subroutine with a GOSUB statement. Note

that the variable N must be assigned the value of the number of records in the file to be sorted. The variable C\$ is a variable string array with each element holding a record. This array must be dimensioned to at least size N. The variable B specifies the length of the field which will be sorted. In this code example it is set to the value of six. Since the data consists of a file of character string records, it is suggested that the data be sorted in the form of a sequential data file on external storage devices.

This sorting program can be used in a variety of applications. For example, sorting addresses by zip code, sorting transactions by account number, or sorting records by a date field.

```

90 N=10: REM N IS # OF RECORDS
100 DIM C$(N)
110 DATA "RICHIE      231105    COOL4"
120 DATA "PAT        250421    BASE9"
130 DATA "TRENT      200818    FARM1"
140 DATA "TRIXIE     222222    KITY3"
150 DATA "ERIC       154210    HSIF8"
160 DATA "ANGIE      021356    SYOB3"
170 DATA "DARRON     312540    DIK12"
180 DATA "TINKER     312450    TIGR7"
190 DATA "THEO       110055    CAT28"
200 DATA "JAK        003451    ACCT5"
210 FOR J=1 TO N
220 READ C$(J)
230 NEXT J
240 PRINT:PRINT:PRINT
250 PRINT"1234567890....5...20....5...30"
255 PRINT
260 PRINTC$(1)
270 PRINT:PRINT "ENTER THE COLUMN # OF THE
    FIELD"
280 PRINT:PRINT "THAT THE FILE IS TO BE SO
    RTED BY";
290 INPUT A
295 PRINT:PRINT
300 REM SET THE LENGTH OF THE FIELD
310 REM TO THE VALUE OF (6)
320 B=6
330 REM ***** SORT BEGINS *****
340 FOR J=1 TO N-1
350 IF (MID$(C$(J),A,B) < MID$(C$(J+1),A,B)
    ) THEN 420
360 T$=C$(J+1)
370 FOR K=J TO 1 STEP -1
380 IF (MID$(C$(K),A,B) < MID$(T$,A,B)) TH
    EN C$(K+1)=T$:GOTO 420
390 C$(K+1)=C$(K)
400 NEXT K
410 C$(1)=T$
420 NEXT J
430 REM ***** SORT ENDS *****
440 FOR J=1 TO N
450 PRINT C$(J)
460 NEXT J
470 PRINT:PRINT "NORMAL TERMINATION"
480 END

```


A Word-Based Voice Synthesizer For The Apple II

David Barron
Spring Valley, NY

Since I purchased my computer I have been interested in voice synthesis. Its applications in CAI, games, and error handling seemed extensive. I decided to apply my newly learned machine language skills to writing my own voice routines.

My routines would have to meet several requirements:

1. They would have to be word based. This would keep the amount of memory per word constant. It would also provide for block memory organization. As well as this, it would simplify the program itself.
2. The routines would have to be easy to use. They would be activated by a POKE and a call, or by similar means. This would enable beginners to use the programs with ease.
3. To eliminate any excess costs, the routines would be hardware independent. They would make use of the Apple's cassette port and built-in speaker.

Memory Organization

The memory used to store a vocabulary is divided into 2000-byte blocks. Each of these blocks will be used to store eight, distinct words. Each word will be stored in its own bit of the block of memory. In other words, bit 0 stores word 0, bit 1 stores word 1, and so on. I chose to store the words this way rather than sequentially to reduce the complexity of the program. If I chose the latter way, many rotate commands would be required. These tend to get confusing, and, if you are not careful, very sloppy.

Since a single word rarely contains periods of silence, no data compression is necessary. Again, this simplifies the program. In order to store data in the correct bit, a few things must be done:

1. Load in the old byte.
2. Get a bit from the input port.
3. Move the input bit to the right position.
4. Plug this bit into the old byte.
5. Store the old byte.

Exactly how this is done will be explained in further detail later on.

How Speech Enters And Exits

The data enters into the program through the cassette and exits through the Apple on-board speaker. First let's talk about recording. Location \$C060 is the *cassette in*. When a byte is read from this location, the seventh bit is affected according to the audio signal present. After this location has been sampled, the seventh bit is isolated. It is then plugged into the correct position as explained above.

When in the playback mode, your voice is produced by the on-board speaker. Because the case resonates at certain frequencies, I would recommend hooking up an external speaker, as I have. This greatly improves the quality of any sound produced by the computer, especially voice. One note: when wiring up the speaker, use shielded cable. If you do not, a tremendous amount of RF interference will occur.

The speaker is controlled by location \$C030. Every time this memory location is accessed, a click is produced by the speaker. Be careful here. If you use a store instruction to toggle the speaker, it will be toggled twice. This is so because the 6502 does a read before any write. This accesses the location twice, thus producing two clicks.

Getting back to the program — once the correct data byte is loaded, the correct bit is isolated. If this bit is different than the last sample obtained, a change in state has occurred. This will result in the toggling of the speaker, producing a sound. Doing this at the proper rate reproduces the recorded word.

Here's a brief explanation of the machine language "record" and "playback" routines:

Record

The Record routine is probably the most complex part of this program. The entry point is \$9000. Here is how it works:

1. All pointers are set. This includes the calculation of the position of the word and the bit that the word is located in.
2. The Y register is set to zero. This will be

the index of the indirect address of the word.

3. A delay loop is executed. This is the start of the main program loop. The delay determines the sampling rate.

4. The sample byte is taken from the cassette port. The seventh bit is then isolated via an AND instruction.

5. The X register is set to \$FF if the input bit was high, or \$00 if the bit was low.

6. This result is moved to the accumulator. There it is ANDed with the byte that contains the bit that the word is to be stored in high. This provides us with a byte that has the bit we want the word in set according to the cassette input. All other bits in the byte are zero. This value is saved.

7. The accumulator is loaded with the mask byte and then inverted. This forms a byte with all bits set, except for the bit that the word will be stored in.

8. The current byte is loaded and then ANDed with the previously obtained value. This leaves the byte undisturbed except for the bit that the word will be stored in. This is set to zero.

9. This value is logically ORed with the byte that contained the data sample in the proper place.

10. At this point we have successfully plugged the input sample into the current byte.

11. The current byte is now stored. We are almost finished.

12. The Y register is incremented. If it is zero, then a page has been completed. In this case the page is incremented.

13. If the last page has been done, the routine ends. If not, then it jumps back to the delay routine and goes one more time.

Play

The playback routine is far simpler than the recording routine. Its entry point is \$9049.

1. All pointers are set. The positions of the word and of its bit are also calculated.

2. This is the beginning of the main loop. A delay is executed. This determines the sampling rate.

3. The Y register is zeroed. It will be the index to the indirect address.

4. The current data byte is sampled.

5. This value is ANDed with the mask byte. This results in all bits being zero except for the bit containing the word data, which is unaffected.

6. This is compared to the last data bit obtained.

7. If the value is the same, then nothing happens.

8. If there is a difference, the speaker is toggled.

9. The Y register is incremented, and the program checks whether a page has been completed.

10. If a page has been completed, the current page is incremented.

11. If the last page was done, the program ends.

12. Otherwise the program loops back until done.

Entering The Program Into Memory

Type in the BASIC Loader (Program 1) and RUN it to put the machine language program into memory. Then type CALL-151 to enter the monitor. Once this has been done, SAVE the program by typing: BSAVE VOC 1:1OBJ0, A\$9000, L\$C3.

The next step is to generate the table used by the mask subroutine. To do this, type the following:

```
*310:01 02 04 08 10 20 40 80
```

To save it, type:

```
BSAVE TABLE,a$310,L$10
```

Using The Program

To use the program requires only three simple steps:

1. POKE 0 with the word number.
2. POKE 772 with the speed.
3. Call the appropriate routine.

A sample program would look something like this:

```
10 POKE 0,1: REM WORD
20 POKE 772,10: REM SPEED
30 CALL 9*4096+64+9: REM PLAY
40 END: REM DONE
```

I have included three sample programs:

Program 2: This is a simple routine that speaks any number put in. You must enter the vocabulary from Table 1 before using it.

Program 3: This is a CAI demo. It is an addition quiz that uses Program 1 as a subroutine. This program shares a vocabulary with Program 1.

Program 4: This is a vocabulary builder. It should be used to build the vocabulary in Table 1.

I hope you enjoy using these routines, as I have. They make your programs many times more pleasant and impressive.

Table 1.

WORD NUMBER	WORD	WORD NUMBER	WORD
0	ZERO	27	NINETY
1	ONE	28	HUNDRED
2	TWO	29	THAT
3	THREE	30	IS
4	FOUR	31	CORRECT
5	FIVE	32	WRONG
6	SIX	33	TRY
7	SEVEN	34	AGAIN
8	EIGHT	35	WHAT
9	NINE	36	PLUS
10	TEN	37	MINUS
11	ELEVEN	38	NEGATIVE
12	TWELVE	39	WELCOME
13	THIRTEEN	40	MATH
14	FOURTEEN	41	QUIZ
15	FIFTEEN	42	PROBLEM
16	SIXTEEN	43	NUMBER
17	SEVENTEEN	44	YOU
18	EIGHTEEN	45	GOT
19	NINETEEN	46	OUT
20	TWENTY	47	OF
21	THIRTY	48	PROBLEMS
22	FORTY	49	OR
23	FIFTY	50	PERCENT
24	SIXTY	51	HOW
25	SEVENTY	52	MANY
26	EIGHTY		

Program 1.

```

10 FOR ADRES=36864TO37055:READ DATTA:POKE ADRES,
  DATTA:NEXT ADRES
36864 DATA 32, 153, 144, 32, 121, 144
36870 DATA 160, 0, 32, 136, 144, 173
36876 DATA 96, 192, 41, 128, 141, 5
36882 DATA 3, 162, 0, 201, 0, 240
36888 DATA 2, 162, 255, 138, 45, 0
36894 DATA 3, 141, 6, 3, 173, 0
36900 DATA 3, 73, 255, 141, 5, 3
36906 DATA 177, 1, 45, 5, 3, 13
36912 DATA 6, 3, 145, 1, 200, 192
36918 DATA 0, 208, 207, 32, 148, 144
36924 DATA 205, 2, 3, 240, 5, 160
36930 DATA 0, 76, 8, 144, 76, 191
36936 DATA 144, 32, 153, 144, 32, 121
36942 DATA 144, 160, 0, 32, 136, 144
36948 DATA 177, 1, 45, 0, 3, 205
36954 DATA 3, 3, 240, 6, 141, 3
36960 DATA 3, 174, 48, 192, 141, 3
36966 DATA 3, 200, 192, 0, 208, 229
36972 DATA 32, 148, 144, 205, 2, 3
36978 DATA 240, 75, 160, 0, 76, 81
36984 DATA 144, 169, 0, 133, 1, 173
36990 DATA 1, 3, 133, 2, 105, 8
36996 DATA 141, 2, 3, 96, 173, 4
37002 DATA 3, 141, 5, 3, 206, 5
37008 DATA 3, 208, 251, 96, 230, 2
37014 DATA 165, 2, 96, 165, 0, 41
37020 DATA 7, 170, 189, 16, 3, 141
37026 DATA 0, 3, 165, 0, 41, 24
37032 DATA 42, 105, 80, 141, 1, 3
37038 DATA 165, 0, 41, 32, 201, 0
37044 DATA 240, 8, 173, 1, 3, 105
37050 DATA 8, 141, 1, 3, 96, 96

```

Program 2.

```

10 HIMEM: 8192
15 IF PEEK (768 + 17) = 2 THEN 50
20 PRINT CHR$ (4); "BLOAD TABLE"
30 PRINT CHR$ (4); "BLOAD VOC 1.1.OBJ0"
40 PRINT CHR$ (4); "BLOAD NUMBERS.VOCAB,"
50 HOME
60 INPUT "TYPE IN YOUR NUMBER (<1000) "; N
70 GOSUB 100
80 GOTO 50
100 REM
110 IF N > 1000 OR N < > INT (N) THEN RETURN

130 IF N = 0 THEN RETURN
135 IF N < 21 THEN W = N: GOSUB 500: RETURN
140 IF N > 99 THEN 300
150 A1 = INT (N / 10)
160 W = A1 + 18: GOSUB 500
170 N = N - 10 * A1
180 GOTO 130
300 A1 = INT (N / 100)
310 W = A1: GOSUB 500
315 W = 28: GOSUB 500
320 N = N - A1 * 100
330 GOTO 130
500 POKE 772,17
510 POKE 0,W
520 CALL 9 * 4096 + 4 * 16 + 9: REM $9049
530 RETURN

```

Program 3.

```

10 HIMEM: 8192
15 IF PEEK (768 + 17) = 2 THEN 50
20 PRINT CHR$ (4); "BLOAD TABLE"
30 PRINT CHR$ (4); "BLOAD VOC 1.1.OBJ0"
40 PRINT CHR$ (4); "BLOAD NUMBERS.VOCAB,"
50 HOME
52 NR = 0
55 GOSUB 1000
60 GOTO 600
99 HOME
100 REM
110 IF N > 1000 OR N < > INT (N) THEN 100
130 IF N = 0 THEN RETURN
135 IF N < 21 THEN W = N: GOSUB 500: RETURN
140 IF N > 99 THEN 300
150 A1 = INT (N / 10)
160 W = A1 + 18: GOSUB 500
170 N = N - 10 * A1
180 GOTO 130
300 A1 = INT (N / 100)
310 W = A1: GOSUB 500
315 W = 28: GOSUB 500
320 N = N - A1 * 100
330 GOTO 130
500 POKE 772,17
510 POKE 0,W
520 CALL 9 * 4096 + 4 * 16 + 9: REM $9049
530 RETURN
600 FOR C = 1 TO P
605 A = INT ( RND (1) * 500): B = INT ( RND (1)
  * 500)
610 W = 35: GOSUB 500
615 PRINT "WHAT ";
620 W = 30: GOSUB 500
625 PRINT "IS ";
630 N = A: GOSUB 100
635 PRINT A; " + "; B
637 PRINT
638 FOR D = 1 TO 200: NEXT D
640 W = 36: GOSUB 500
650 N = B: GOSUB 100

```



```

660 INPUT N
662 IF N = A + B THEN NR = NR + 1: GOTO 800
665 Q = Q + 1: IF Q > 2 THEN Q = 0: GOTO 850
680 W = 33: GOSUB 500: W = 34: GOSUB 500
700 GOTO 610
800 W = 29: GOSUB 500
805 PRINT "THAT ";
810 W = 30: GOSUB 500
815 PRINT "IS ";
820 W = 31: GOSUB 500
825 PRINT "CORRECT"
830 FOR R = 1 TO 200: NEXT
850 N = A: GOSUB 100
855 PRINT : PRINT A;
860 W = 36: GOSUB 500
865 PRINT " + ";
870 N = B: GOSUB 100
875 PRINT B;
880 W = 30: GOSUB 500
885 PRINT " IS ";
890 N = A + B: GOSUB 100
895 PRINT A + B
897 FOR R = 1 TO 150: NEXT R
900 NEXT C
910 FOR D = 1 TO 300: NEXT
915 PRINT "YOU "; W = 44: GOSUB 500
917 PRINT "GOT "; W = 45: GOSUB 500
919 PRINT NR; " "; N = NR: GOSUB 100
921 PRINT "OUT "; W = 46: GOSUB 500
923 PRINT "OF "; W = 47: GOSUB 500
925 PRINT P; " "; N = P: GOSUB 100
927 PRINT "CORRECT "; W = 31: GOSUB 500
929 PRINT : PRINT "OR "; W = 49: GOSUB 500
931 PRINT INT ((NR / P) * 100); " "; N = INT ((
NR / P) * 100): GOSUB 100
935 PRINT "PERCENT": W = 50: GOSUB 500
940 END
1000 DATA 39,WELCOME,2,TO,40,MATH,41,QUIZ,1,ONE

1010 DATA 51,HOW,52,MANY,48,PROBLEMS
1020 FOR R = 1 TO 5: READ W,A$
1030 GOSUB 500
1040 PRINT A$; " ";
1045 FOR D = 1 TO 130: NEXT D
1050 NEXT
1055 PRINT : PRINT : FOR D = 1 TO 300: NEXT D
1060 FOR R = 1 TO 3: READ W,A$: GOSUB 500
1065 FOR D = 1 TO 130: NEXT D
1070 PRINT A$; " "; NEXT
1080 INPUT P
1090 N = P: GOSUB 100
1100 RETURN

210 GET T$
215 PRINT
220 PRINT CHR$(4); "CATALOG"
230 INPUT "TYPE YOUR FILENAME AND HIT RETURN "
      (RET FOR NONE) ==>"; N$
240 IF N$ = "" THEN 260
250 PRINT CHR$(4); "BLOAD "; N$; ",A$5000"
252 PRINT CHR$(4); "OPEN"; N$; ".VOC"
253 PRINT CHR$(4); "READ"; N$; ".VOC"
254 FOR R = 0 TO 64
255 INPUT W$(R)
256 NEXT R
257 PRINT CHR$(4); "CLOSE"
260 REM MAIN MENU
270 HOME
280 HTAB 15: PRINT "MAIN MENU"
290 VTAB 7
300 PRINT "1-ENTER A WORD
310 PRINT
320 PRINT "2-PLAY A WORD
330 PRINT
340 PRINT "3-PRINT A VOCABULARY SHEET"
350 PRINT
360 PRINT "4-QUIT"
370 PRINT : PRINT
380 PRINT "ENTER YOUR SELECTION==>";
390 GET C$
400 IF C$ < "1" OR C$ > "4" THEN 390
410 PRINT C$
420 ON VAL (C$) GOTO 1000,2000,3000,430
430 PRINT : PRINT "DO YOU REALLY WANT TO QUIT "
      ";
440 GOSUB 5000
450 IF F = 0 THEN 260
460 FOR R = 1 TO 20: PRINT : NEXT
470 INPUT "ENTER FILENAME TO SAVE AND HIT RETU
      RN (RET FOR NONE)"; N$
480 IF N$ = "" THEN 30000
490 PRINT CHR$(4); "BSAVE"; N$; ",A$5000,L$3FFF"

500 PRINT CHR$(4); "OPEN"; N$; ".VOC"
510 PRINT CHR$(4); "WRITE"; N$; ".VOC"
520 FOR WO = 0 TO 64
530 PRINT W$(WO)
540 NEXT WO
550 GOTO 30000
1000 HOME
1010 PRINT "SINGLE WORD OR SERIES (S OR E)?";
1020 GET T$
1025 PRINT
1030 IF T$ = "S" THEN 1090
1050 PRINT : PRINT "ENTER STARTING WORD NUMBER "
      ";
1060 INPUT ST
1070 INPUT "ENDING WORD NUMBER "; EN
1080 GOTO 1100
1090 INPUT "ENTER WORD NUMBER "; ST: EN = ST
1100 FOR WO = ST TO EN
1110 HOME
1120 PRINT "WORD NUMBER :"; WO
1130 VTAB 5
1140 PRINT "ENTER WORD NAME - DEFAULT="; W$(WO)
1150 INPUT N$
1160 IF N$ = "" THEN N$ = W$(WO)
1170 W$(WO) = N$
1180 VTAB 10
1190 PRINT "ENTER SPEED - DEFAULT="; SP
1200 INPUT N$
1210 IF N$ = "" THEN 1230
1220 SP = VAL (N$)
1230 POKE 772,SP
1240 POKE 0,WO
1250 PRINT : PRINT "HIT ANY KEY TO RECORD"
1260 GET T$
1270 CALL REC

```

Program 4.

```

5 SP = 10
7 DIM W$(65)
100 TEXT : HOME
110 HIMEM: (5 * 4096) - 1: REM $4FFF
112 REC = 9 * 4096: REM $9000
113 PLAY = 9 * 4096 + 4 * 16 + 9: REM $9049
115 IF PEEK (REC) = 32 THEN 140
120 PRINT CHR$(4); "BLOAD TABLE,A$310"
130 PRINT CHR$(4); "BLOAD VOC 1.1.OBJ0,A$9000"

140 HTAB 10
150 PRINT "VOCABULARY BUILDER"
160 POKE 34,1
170 VTAB 5
180 PRINT "HAVE YOU ALREADY MADE A VOCABULARY "
      "?";
185 GOSUB 5000
190 IF F = 0 THEN 260
200 PRINT : PRINT : PRINT "HIT A KEY";

```



```

1280 PRINT : PRINT "HIT ANY KEY FOR PLAYBACK"
1290 GET T$
1300 CALL PLAY
1310 PRINT "WAS THAT OK ?";: GOSUB 5000
1320 IF F = 0 THEN 1110
1330 NEXT WO: GOTO 260
2000 HOME
2010 PRINT "SINGLE WORD OR SERIES (S OR E)?"
2020 GET T$
2030 PRINT
2040 IF T$ = "S" THEN 2090
2050 PRINT : PRINT "ENTER STARTING WORD NUMBER ~
";
2060 INPUT ST
2070 INPUT "ENDING WORD NUMBER ";EN
2080 GOTO 2100
2090 INPUT "ENTER WORD NUMBER ";ST:EN = ST
2100 FOR WO = ST TO EN
2110 HOME
2120 PRINT "WORD NUMBER :";WO
2130 VTAB 5
2140 PRINT "ENTER WORD NAME - DEFAULT=";W$(WO)
2150 INPUT N$
2160 IF N$ = "" THEN N$ = W$(WO)
2170 W$(WO) = N$
2180 VTAB 10
2190 PRINT "ENTER SPEED - DEFAULT=";SP
2200 INPUT N$
2210 IF N$ = "" THEN 2230

```

```

2220 SP = VAL (N$)
2230 POKE 772,SP
2240 POKE 0,WO
2280 PRINT : PRINT "HIT ANY KEY FOR PLAYBACK"
2290 GET T$
2300 CALL PLAY
2330 NEXT WO: GOTO 260
2670 CALL REC
3000 HOME
3005 HTAB 5
3010 PRINT "HIT ANY KEY TO START PRINTOUT"
3020 PRINT CHR$(4);"PR#1"
3030 PRINT "WORD NUMBER"; TAB(20);"WORD"
3040 FOR X = 1 TO 40: PRINT "-";: NEXT X
3045 PRINT
3050 FOR WO = 0 TO 63
3060 PRINT WO; TAB(20);W$(WO)
3070 NEXT WO
3075 PRINT CHR$(4);"PR#0"
3080 GOTO 260
4999 END
5000 GET T$
5010 IF T$ < > "Y" AND T$ < > "N" THEN 5000
5020 F = 0
5030 IF T$ = "N" THEN PRINT "NO"
5040 IF T$ = "Y" THEN F = 1: PRINT "YES"
5050 RETURN
30000 END

```

©

Function VAL (X) In UCSD PASCAL For Apple II

Michael Erperstorfer
Vienna, Austria

Function VAL (X) is similar to BASIC's VAL-function:

X must be a string of an integer number;

VAL returns a true integer number;

If X is no integer number VAL returns 0;

String X may have leading or trailing spaces.

```

PROGRAM VALTEST;
VAR INPUT : STRING;
FUNCTION VAL (S : STRING) : INTEGER;
VAR START,I,LEN,O,V : INTEGER;
    NEG : BOOLEAN;
BEGIN
  V:=0;
  NEG:=FALSE;
  WHILE COPY (S,1,1) = ' ' DO S:=COPY (S,2,
    LENGTH (S)-1);
  (* remove blanks from left *)
  WHILE COPY (S,LENGTH (S),1)=' ' DO S:=COPY
    (S,1,LENGTH (S)-1);
  (* remove blanks from right *)

```

```

START:=1;
IF COPY (S,1,1) = '-' THEN
  BEGIN

```

```

    START:=2;
    NEG:=TRUE
  END;

```

```

  (* if first char = '-' *)
  (* number is negative *)
  (* increment start value *)
  (* to skip '-' sign *)
  (* set neg-flag *)

```

```

LEN:=LENGTH (S);
FOR I:=START TO LEN DO
  BEGIN

```

```

    O:=ORD (S[I]);
    IF (O>47) AND (O<58) THEN
      (*check if char is number *)
      V:=V + TRUNC (PWROFTEN (LEN-I)) * (O-48)
      (* calculate value *)
    ELSE

```

```

      BEGIN
        (* if char is not number *)
        VAL:=0;
        (* set value to 0 *)
        EXIT (VAL)
        (* and exit function *)
      END
    END;

```

```

  IF NEG THEN VAL:=-V ELSE VAL:=V
END;

```

```

BEGIN
  REPEAT
    WRITE ('STRING: ');
    READLN (INPUT);
    WRITELN ('= ',VAL (INPUT))
  UNTIL INPUT=' '
END.

```

©

To check a tape using this program, rewind the tape after a SAVE (while the program is still also in the computer's memory), type CALL 768, and do not hit return until after you have started your tape.

Verify Your Applesoft Tapes

Keith Falkner
Venice, FL

Imagine this – you've written a dandy program in Applesoft, tested it, debugged it, perfected it, and of course SAVED it.

But is the program *really* saved? Can you load the tape? If the tape recorder has developed a problem, you may lose this program forever as soon as you type NEW or turn off your Apple.

Here is how to know for sure. Below is a machine language program which verifies the accuracy of a SAVED Applesoft program on tape. To make use of this program:

1. Type in Program 1 and RUN it.
2. From the machine language monitor, SAVE it to tape via 300.393W or to disk via BSAVE VERIFY,A\$300,L\$94.
3. When you need it, BLOAD VERIFY from disk or enter the monitor with CALL -151 and reload it from tape via 300.393R (this does *not* affect an Applesoft program in memory).
4. SAVE the Applesoft program as normal.
5. Operate the tape recorder just as you would to LOAD an Applesoft program, but type CALL 768 instead of LOAD. The tape will be read and compared to the Applesoft program.
6. If the comparison is successful, there will be no error message, just the two BEEPs which accompany LOAD.
7. If, alas, the tape is not a readable copy of the program, the message ERR will appear, with the address of the error and the values of the byte on tape and the byte in memory.

An error message is never good news, but it is far better to know of a problem before the program is lost than to rely on a tape which later proves unreadable.

An Applesoft program on tape is really two data records: the first record is four bytes long and indicates the size of the Applesoft program. If this header is read accurately, the computer beeps, but prints nothing. The second data record on tape is as long as the header indicates, and contains an image of the program. When this is successfully read, whether by LOAD or by the verify program below, the computer beeps again.

Load naturally shoves the incoming data into memory, but Program 1 harmlessly compares what is read with what is in memory. If those bytes differ, an error message appears: ERR 08EB-88 (8C) for example, which means that at location \$8EB, the byte in memory is \$88 (the token for GR), but the tape contains \$8C (the token for CALL). As soon as it reports such an error, the VERIFY routine quits. At this point, nothing in memory has been altered, so the SAVE can be retried, perhaps with a different tape or a different volume level.

Take the time to type this routine into your Apple and save it. Sooner or later you will want assurance that a saved Applesoft tape is the accurate program you hope it is.

Type in the Applesoft program and it will build this machine language verify routine starting at address 768 when you type RUN.

```

100 FOR I=768 TO 915:READ X:POKE I,
    X:NEXT
768 DATA 162, 0, 32, 117, 253, 160, 2,
    138, 145, 105
778 DATA 200, 169, 0, 145, 105, 200, 169,
    2, 145, 105
788 DATA 189, 9, 2, 41, 127, 157, 0,
    2, 202, 224
798 DATA 255, 208, 243, 96, 32, 61, 3,
    165, 103, 133
808 DATA 60, 165, 104, 133, 61, 165, 175,
    133, 62, 165
818 DATA 176, 133, 63, 32, 61, 3, 169,
    141, 76, 237
828 DATA 253, 32, 250, 252, 169, 22, 32,
    201, 252, 133
838 DATA 46, 32, 250, 252, 160, 36, 32,
    253, 252, 176
848 DATA 249, 32, 253, 252, 160, 59, 32,
    236, 252, 240
858 DATA 14, 69, 46, 133, 46, 32, 186,
    252, 160, 52
868 DATA 144, 240, 76, 38, 255, 234, 234,
    234, 193, 60
878 DATA 240, 235, 72, 32, 45, 255, 32,
    146, 253, 177
888 DATA 60, 32, 218, 253, 169, 160, 32,
    237, 253, 169
898 DATA 168, 32, 237, 253, 104, 32, 218,
    , 253, 169, 169
908 DATA 32, 237, 253, 169, 141, 76, 237,
    , 253

```


CAPUTE!:

Modifications Or Corrections To Previous Articles

Machine Language: First Steps

There are two corrections to be made to Jim Butterfield's series of columns "Machine Language: First Steps" (May through July, 1982). In the BASIC program which appeared several times in this series, line 220 should be changed to read:

```
220 J=48:FOR K=1 TO V
```

and in Part III (July 1982, p. 150), line 120 should read:

```
120 DATA 3,144,239,169,13,32,210,255,96
```

VIC Curiosities

The correct POKE to disable the LIST command on the VIC ("VIC Curiosities," August 1982, p. 140) is POKE 775,200.

Apple Chemistry Lab

There are several typos in the chemistry simulation ("Chemistry Lab," August 1982, p. 75). Line 1220 should include a second parenthesis (X0) and lines 6035, 6050, and 6120 use a colon, not a semicolon. Lines 1041 and 1047 should start with PRINT " and line 7001 should start with DATA.

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COMPUTE!'s Listing Conventions

Many of the programs which are listed in **COMPUTE!** use special keys (cursor control keys, color keys, etc.). To make it easy to tell *exactly* what should be typed in when copying a program into the computer, we have established the following listing conventions.

For The Atari

In order to make special characters, inverse video, and cursor characters easy to type in, **COMPUTE!** magazine's Atari listing conventions are used in all the program listings in this magazine.

Please refer to the following tables and explanations if you come across an unusual symbol in a program listing.

Atari Conventions

Characters in inverse video will appear like: **INVERSE VIDEO**. Enter these characters with the Atari logo key, {A}.

When you see	Type	See
{CLEAR}	ESC SHIFT <	⌘ Clear Screen
{UP}	ESC CTRL -	↑ Cursor Up
{DOWN}	ESC CTRL =	↓ Cursor Down
{LEFT}	ESC CTRL +	← Cursor Left
{RIGHT}	ESC CTRL *	→ Cursor Right
{BACK S}	ESC DELETE	⌫ Backspace
{DELETE}	ESC CTRL DELETE	⌘ Delete character
{INSERT}	ESC CTRL INSERT	⌘ Insert character
{DEL LINE}	ESC SHIFT DELETE	⇧ Delete line
{INS LINE}	ESC SHIFT INSERT	⇧ Insert line
{TAB}	ESC TAB	⌥ TAB key
{CLR TAB}	ESC CTRL TAB	⌘ Clear tab
{SET TAB}	ESC SHIFT TAB	⇧ Set tab stop
{BELL}	ESC CTRL 2	⌘ Ring buzzer
{ESC}	ESC ESC	⌘ ESCape key

Graphics characters, such as CTRL-T, the ball character ● will appear as the "normal" letter enclosed in braces, e.g. {T}.

A series of identical control characters, such as 10 spaces, three cursor-lefts, or 20 CTRL-R's, will appear as {10 SPACES}, {3 LEFT}, {20 R}, etc. If the character in braces is in inverse video, that character or characters should be entered with the Atari logo key. For example, {A} means to enter a reverse-field heart with CTRL-comma, {5 A} means to enter five inverse-video CTRL-U's.

For PET/CBM/VIC

Generally, any PET/CBM/VIC program listings will contain bracketed words which spell out any special characters: {DOWN} would mean to press the cursor-down key; {3DOWN} would mean to press the cursor-down key three times.

To indicate that a key should be *shifted* (hold down the SHIFT key while pressing the other key), the key would be underlined in our listing. For example, S would mean to type the S key while holding the shift key. This would result in the "heart" graphics symbol appearing on your screen.

Sometimes in a program listing, especially within quoted text when a line runs over into the next line, it is difficult to tell where the first line ends. How many times should you type the SPACE bar? In our convention, when a line breaks in this way, the ~ symbol shows exactly where it broke. For example:

```
100 PRINT "TO START THE GAME ~
    YOU MAY HIT ANY OF THE KEYS
    ON YOUR KEYBOARD."
```

shows that the program's author intended for you to type two spaces after the word *GAME*.

For The Apple

Programs listed as "Microsoft" are written for the PET/CBM,

Apple, OSI, etc. Although the programs are general in nature, you may need to make a few changes for them to run correctly on your Apple. Microsoft BASIC programs written for the PET/CBM sometimes contain special cursor control characters. The following table shows equivalent Apple words. Notice that these Apple commands are *outside* quotations (and even separate from a PRINT statement). PRINT "[RVS]YOU WON" becomes INVERSE: PRINT "YOU WON":NORMAL

{CLEAR} (Clear Screen) HOME
 {DOWN} (Cursor down)
 Apple II + : Call -922
 POKE 37,PEEK(37)+(PEEK(37)<23)
 {UP} (Cursor up)
 POKE 37,PEEK(37)-(PEEK(37)>0))
 {LEFT} (Cursor left) PRINT CHR\$(8);
 {RIGHT} (Cursor right)
 PRINT CHR\$(21)

{RVS} (Inverse video on. Turns off automatically after a carriage return. To be safe, turn off inverse video after the print statement with NORMAL unless the PRINT statement ends with a semicolon.)

INVERSE

{OFF} (Inverse video off) NORMAL

Shifted characters can represent either graphics characters or uppercase letters. If within text, just use the non-shifted character, otherwise substitute a space. Some "generalized" programs contain a POKE such as POKE 59468,14. Omit these from the program when typing it in. One final note: you will probably want to insert a question mark or colon within an INPUT prompt. PET/CBM and many other BASICs automatically print a question mark:

INPUT "WHAT IS YOUR NAME";N\$

becomes

INPUT "WHAT IS YOUR NAME?";N\$

All Commodore Machines

Clear Screen {CLEAR}	Cursor Left {LEFT}
Home Cursor {HOME}	Insert Character {INST}
Cursor Up {UP}	Delete Character {DEL}
Cursor Down {DOWN}	Reverse Field On {RVS}
Cursor Right {RIGHT}	Reverse Field Off {OFF}

VIC Conventions

Set Color To Black {BLK}	Function Two {F2}
Set Color To White {WHT}	Function Three {F3}
Set Color To Red {RED}	Function Four {F4}
Set Color To Cyan {CYN}	Function Five {F5}
Set Color To Purple {PUR}	Function Six {F6}
Set Color To Green {GRN}	Function Seven {F7}
Set Color To Blue {BLU}	Function Eight {F8}
Set Color To Yellow {YEL}	Any Non-implemented
Function One {F1}	Function {NIM}

8032/Fat 40 Conventions

Set Window Top {SET TOP}	Erase To Beginning {ERASE BEG}
Set Window Bottom {SET BOT}	Erase To End {ERASE END}
Scroll Up {SCR UP}	Toggle Tab {TGL TAB}
Scroll Down {SCR DOWN}	Tab {TAB}
Insert Line {INST LINE}	Escape Key {ESC}
Delete Line {DEL LINE}	

COMPUTE! Back Issues

Here are some of the applications, tutorials, and games from available back issues of **COMPUTE!**. Each issue contains much, much more than there's space here to list, but here are some highlights:

February 1981: Simulating PRINT USING, Using the Atari as a Terminal for Telecommunications, Attach a Printer to the Atari, Double Density Graphing on C1P, Commodore Disk Systems, PET Crash Prevention, A 25¢ Apple II Clock.

May 1981: Named GOSUB/GOTO in Applesoft, Generating Lower Case Text on Apple II, Copy Atari Screens to the Printer, Disk Directory Printer for Atari, Realtime Clock on Atari, PET BASIC Delete Utility, PET Calculated Bar Graphs, Running 40 Column Programs on a CBM 8032.

June 1981: Computer Using Educators (CUE) on Software Pricing, Apple II Hires Character Generator, Ever-expanding Apple Power, Color Burst for Atari, Mixing Atari Graphics Modes 0 and 8, Relocating PET BASIC Programs, An Assembler In BASIC for PET, QuadraPET: Multitasking?

July 1981: Home Heating and Cooling, Animating Integer BASIC Loops Graphics, The Apple Hires Shape Writer, Adding a Voice Track to Atari Programs, Machine Language Atari Joystick Driver, Four Screen Utilities for the PET, Saving Machine Language Programs on PET Tape Headers, Commodore ROM Systems, The Voracious Butterfly on OSI.

August 1981: Minimize Code and Maximize Speed, Apple Disk Motor Control, A Cassette Tape Monitor for the Apple, Easy Reading of the Atari Joystick, Blockade Game for the Atari, Atari Sound Utility, The CBM "Fat 40," Keyword for PET, CBM/PET Loading, Chaining, and Overlaying.

October 1981: Automatic DATA Statements for CBM and Atari, VIC News, Undeletable Lines on Apple, PET, VIC, Budgeting on the Apple, Switching Cleanly

from Text to Graphics on Apple, Atari Cassette Boot-tapes, Atari Variable Name Utility, Atari Program Library, Train your PET to Run VIC Programs, Interface a BSR Remote Control System to PET, A General Purpose BCD to Binary Routine, Converting to Fat-40 PET.

December 1981: Saving Fuel \$\$ (Multiple Computers: versions for Apple, PET, and Atari), Unscramble Game (multiple computers), Maze Generator (multiple computers), Animating Applesoft Graphics, A Simple Printer Interface for the Apple II, A Simple Atari Wordprocessor, Adding High Speed Vertical Positioning to Atari P/M Graphics, OSI Supercursor, A Look At SuperPET, Supermon for PET/CBM, PET Mine Maze Game.

January 1982: Invest (multiple computers), Developing a Business Algorithm (multiple computers), Apple Addresses, Lowercase with Unmodified Apple, Cryptogram Game for Atari, Superfont: Design Special Character Sets on Atari, PET Repairs for the Amateur, Micromon for PET, Self-modifying Programs in PET BASIC, Tiny-mon: a VIC Monitor, Vic Color Tips, VIC Memory Map, ZAP: A VIC Game.

February 1982: Insurance Inventory (multiple computers), Musical Transposition (multiple computers), Multitasking Emulator (multiple computers), Disassemble Apple Programs from BASIC, Plotting Polar Graphs on Apple, Atari P/M Graphics Made Easy, Atari PILOT, Put A Rainbow in your Atari, Marquee for PET, PET Disk Disassembler, VIC Paddles and Keyboard, VIC Timekeeping.

March 1982: Word Hunt Game (multiple computers), Infinite Precision Multiply (multiple computers), Atari Concentration Game, VIC Starfight Game, CBM BASIC 4.0 To Upgrade Conversion Kit, Apple Addresses, VIC Maps, EPROM Reliability, Atari Ghost Programming, Atari Machine Language Sort, Random Music Composition on PET, Comment Your Apple II Catalog.

April 1982: Track Down Those Memory

Bugs (multiple computers), Shooting Stars Game (multiple computers), Intelligent Input Subroutines (multiple computers), Ultracube for Atari, Customizing Apple's Copy Program, Using PET/CBM In The High School Physics Lab, Grading Exams on a Microcomputer (multiple computers), Atari Mailing List, Renumber VIC Programs The Easy Way, Browsing the VIC Chip, Disk Checkout for PET/CBM.

May 1982: VIC Meteor Maze Game, Atari Disk Drive Speed Check, Modifying Apple's Floating Point BASIC, Fast Sort For PET/CBM, Extra Atari Colors Through Artifacts, Life Insurance Estimator (multiple computers), PET Screen Input, Getting The Most Out Of VIC's 5000 Bytes.

Home and Educational COMPUTING! (Fall 1981 and Summer 1981 – count as one back issue): Exploring The Rainbow Machine, VIC As Super Calculator, Custom Characters, Alternate Screens, Automatic Line Numbers, Using The Joystick (Spacewar Game), Fast Tape Locator, Window, VIC Memory Map.

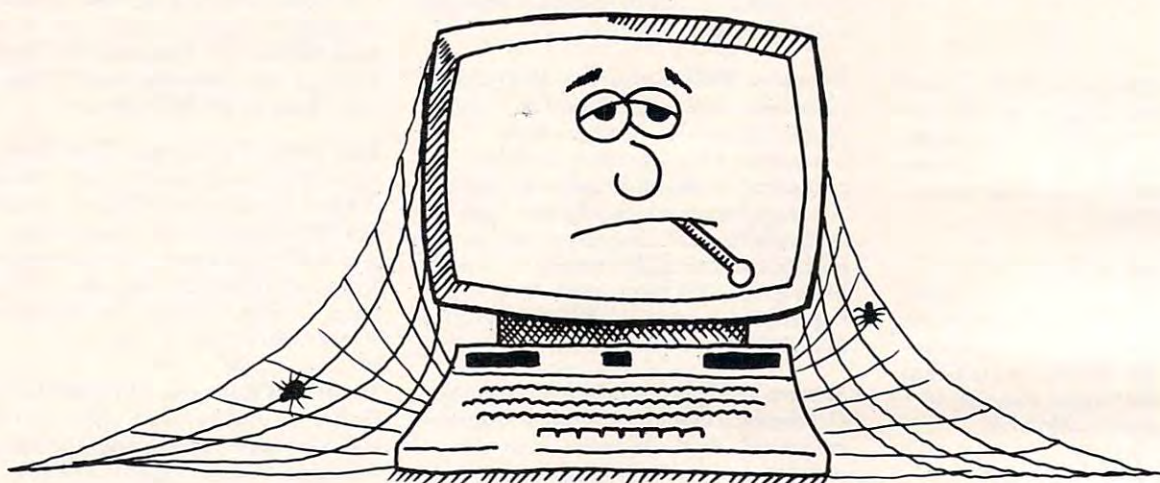
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New Products

Christmas Music For The Atari

B.I.G. Software announces the release of the first three of a scheduled seven volumes of Christmas Music for the Atari 400/800 Computer.

Each volume contains ten Christmas favorites and requires only a BASIC cartridge for operation. Every volume contains a different set of songs such as *Silent Night*, *The First Noel*, and many other favorites. Each song features four-part harmony and smooth, accurate song reproduction.

The program is available in two formats: Version One for 8K to 24K tape drives or 16K to 32K disk drives; and Version Two for 32K tape or 40K disk. Version Two allows the user a wide variety of options for song play. Individual songs can be selected, and each song can be repeated a given number of times or allowed to play continuously. In addition, the user can play all ten songs in the order they are listed in the program, or he can select from the available songs. This sequence can then be repeated indefinitely, and each song within the sequence can also be set for multiple play.

Christmas Music Volumes 4, 5 and 6 are scheduled for release in October, and Volume 7 in early November. Volume 7 will feature the *Hallelujah Chorus* from Handel's *Messiah*, *Ave Maria*, *O Holy Night*, and several other well-known selections. Due to the memory requirements for Volume 7, it will be available only in the Version Two format.

Future releases will include Pop and Show Tunes, Country and Western, as well as a wide selection of Classical music.

Retail prices range from \$12.95 for a one-volume tape version to \$34.95 for the three-volume disk. Words to all songs are available at a small additional cost.

*B.I.G. Software
533 Airport Blvd., Suite 518
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Expansion Chassis For VIC

Arfon Microelectronics, Ltd. has announced a new product – the Arfon Micro VIC-20 Expansion Chassis. The Micro VIC-20 Expansion Chassis enhances the VIC-20 system by fully expanding the VIC-20 memory; plugging in

interfaces for data retrieval; and controlling applications, other computer peripherals, cartridges for expanded BASIC language functions, and programming utilities.

The Arfon Micro VIC-20 Expansion Chassis has the following features: seven expansion slots; all aluminum construction; large power supply with toroidal transformer; five volt supply direct to the VIC-20 for cooler operation; 24 volt supply for the Arfon Micro VIC printer; detachable cover to protect cartridges; housing for VIC and Expansion in one portable unit; holder for RF modulator; and support for all VIC-20 cartridges from Arfon Micro, Commodore, and others.

*Arfon Microelectronics, Ltd.
111 Rena Drive
Lafayette, LA 70503
(318)988-2478*



Arfon Micro VIC-20 Expansion Chassis shown here with cover removed.



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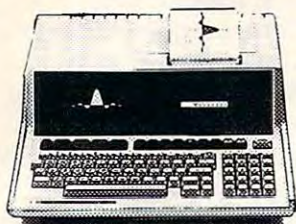
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Data Perfect Apple From LJK

LJK Enterprises, Incorporated announced the release of their new program Data Perfect Apple, for the Apple II and II+ computer. Written in machine language, Data Perfect requires no disk swapping and is fully interactive with LJK Word Processor, Letter Perfect. This user-friendly program allows the operator to design his own screen mask, in either 40 or 80 column. The single-load program, which is menu driven, has an incorporated utilities section, as well as a report generator and a mailing label generator. Multiple searches and sorts are allowed. Complete formula operations, as well as mathematical operations, may be performed on and between fields. The program supports one or two disk drives and requires a minimum of 32K memory. Use with any printer is allowed. The introductory cost for the program is \$99.95.

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Computer Conference

The Mid-South Association for Educational Data Systems is calling for proposals for its 10th Annual Conference to be held February 24-26, 1983 in Jackson, MS. The theme will be "The Computer As A Universal Machine."

Papers, workshops, demonstrations, and ideas for discussion sessions are being solicited on ways computers are and can be used as universal machines in educational settings. Areas of special interest include the computer's use as a tool for administrators, for teachers, and for students — especially in inter-

disciplinary approaches.

For information on how to submit abstracts, contact Linda Wyrick Winkle, Department of Curriculum and Instruction, School of Education, University of Mississippi, University, MS 38677 (601-232-5906). Abstracts should be submitted by November 1.

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Educators may obtain a free copy by writing to K-12 MicroMedia.

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Designed to be used while students are working at the microcomputer, *Getting Down to BASIC* clearly and concisely explains and illustrates key BASIC commands, statements, and elementary programming techniques, including loops, flowcharting, and graphics commands. Differences among Apple, PET, and TRS-80 are noted throughout. Eight labs conveniently segment the material into manageable lessons. A glossary explains over 50 common computer terms.

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TRS-80 Color Computer Program

Micro School Programs has announced a new program, *Colortext*, for use on TRS-80, 32K Color Computers, with one disk drive. Colortext is an easy-to-use high-resolution text driver which displays a variety of character fonts and graphics on the screen simultaneously, including the use of all features of Extended BASIC. It permits the intermixing of upper and lowercase text and graphics in various sizes and colors.

Other features include non-destructive overwrite for animation, variable screen scrolling speed, a BREAK key lock-up option, and ADDCHR – a program for creating and editing all characters (including graphics, alphanumeric, etc.). ADDCHR can be used to create character

sets of up to 200 characters. The defined character sets may be used for foreign languages such as Greek, Hebrew, Russian, or for various other print types.

The TRS-80 Model III graphics character set is included in Colortext. This permits the user to enter and use programs written for Models I and III very quickly, using the same graphics character set numbers used in the other programs. This character set may be changed by the user if desired.

This program is intended for use by curriculum authors, teachers, game designers, or by anyone who wishes to prepare programs which involve the simultaneous use of text, graphics, and color. User programs (up to 16K) will run with Colortext on 32K machines.

The more than 50-page user's manual provides complete instructions on the use of the

program. Users are led through a practice program which introduces them to the various features of Colortext. A demonstration program is also included on the disk to illustrate character sets, colors, display techniques, and animation. Two reference sections are also included, one for Colortext and one for the ADDCHR program.

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Complete documentation for use and installation is provided with each board. The Graphics + Plus is available from your local dealer (or direct from Lazer Microsystems) for only \$159.95. For those who do not own a Lower Case

+ Plus or a Lower Case + Plus III, Lazer offers a special package price consisting of a Lower Case + Plus III and Graphics + Plus for only \$199.95.

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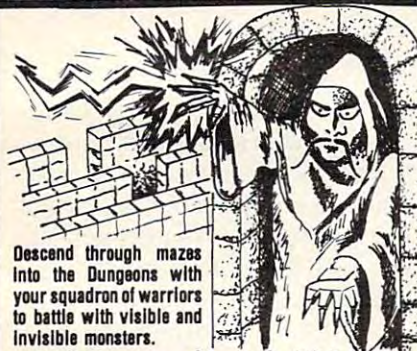
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The Paper, one of the oldest independent publications supporting Commodore computers, is merging with the *Midnite Software Gazette*, beginning with the October 1982 issue.

To celebrate the merger, a contest is underway to rename the merged magazines. The person suggesting the best name will receive a free VIC computer, courtesy of Computer Country

of Springfield, Illinois. Judging will be by the editors, and in case of ties, by the readers of the combined magazine. Entries must be received by November 1 at the address below.

Midnite specializes in brief independent reviews of products for Commodore computers. Its current issue is a 300+ page \$10 book.

The Paper has traditionally been a source of articles and tutorials for users of Commodore computers, with series on such topics as first steps in machine language, as well as extended reviews of important products.

Subscriptions to the combined magazine are \$20 U.S. or \$25 CDN. in North America for six bi-monthly issues. Overseas subscriptions are \$45 U.S.

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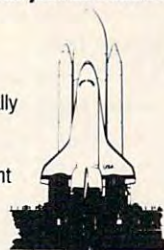
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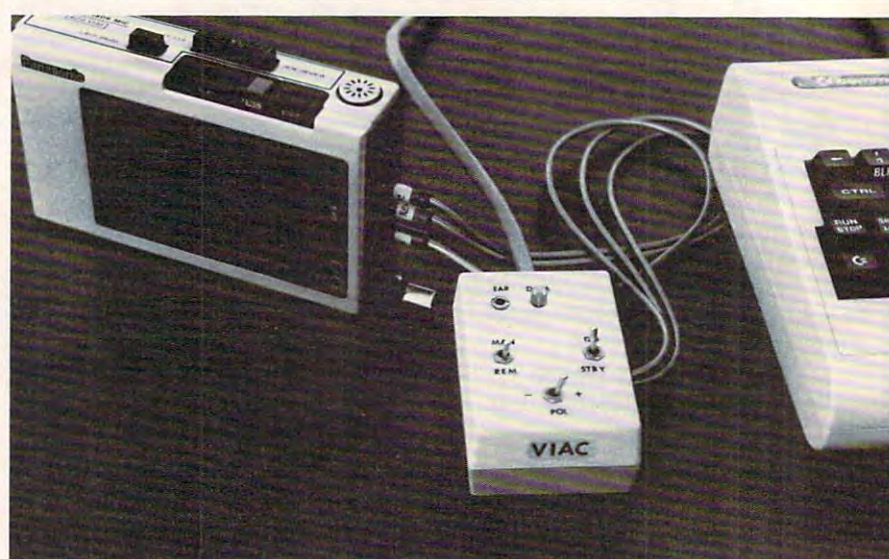
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3. The POLARITY +/- Switch allows various types of cassettes with different outputs to be interfaced with the computer. A simple procedure establishes the output polarity of the cassette. Once set, this switch need not be changed unless a different cassette is interfaced with the computer.

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Some added features available when using an audio cassette:

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— Makes program locating and editing on tape much easier.

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— Can make audio tape to tape duplications with another cassette.

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Seminars On Microcomputers In Education

Queue, Inc., has planned several hands-on workshops on microcomputers in education for this fall and winter. All will be held in the Greater New York and Connecticut area.

The first symposium and exhibit will be on *Microcomputers in the Language Arts Curriculum*. The two day program (Friday and Saturday, November 5-6) will include hands-on exhibitions of leading software products in reading, vocabulary, spelling, language, and social studies.

The second seminar, *Microcomputers in Mathematics, Science, and Computer Education Curriculum* (Friday and Saturday, November 12-13), will include hands-on exhibitions of a wide variety of

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A third seminar on *Administrative and Classroom Management Applications of Microcomputers* (January 21-22) will exhibit a wide variety of software for teacher authoring systems, classroom management, and school administration.

Prices for the seminars will be \$45 for one day, \$75 for the entire session. A school system may enroll for both sessions for \$135, and may designate different personnel to attend each session, or even each day.

For further information, contact:

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Apple And Atari Programs From Synergistic Software

Synergistic Software has released the Inventory Manager, an inventory control software package for the Apple II computer.

The Inventory Manager can deal with 2700 different inventory items on a two disk system and with 1200 inventory items on a one disk system. It can break the inventory items down to 13 different categories of stock and can list 99 vendors who supply those inventory items.

The Inventory Manager issues reports which summarize profit margins, calculate wholesale to retail mark-ups, list back order status, recommend reorder points, print purchase

orders, and more. The program can list the 75 top selling items with their profit margins or can list the profit margins of the 13 different categories.

Owners of small to medium-sized retail businesses can use the Inventory Manager to check what they have ordered, what they have received, and what is on back order. This program is fast, menu-driven, and user-friendly. Cost is \$149.95.

* * * * *

Synergistic Software also announces the release of Probe One, a new action adventure game for the Atari 400/800.

Probe One combines high-resolution color graphics, sound effects, arcade-like action, and adventure strategy. The Terran Confederation is fighting the domineering Drelgan Hegemony for possession of a newly de-

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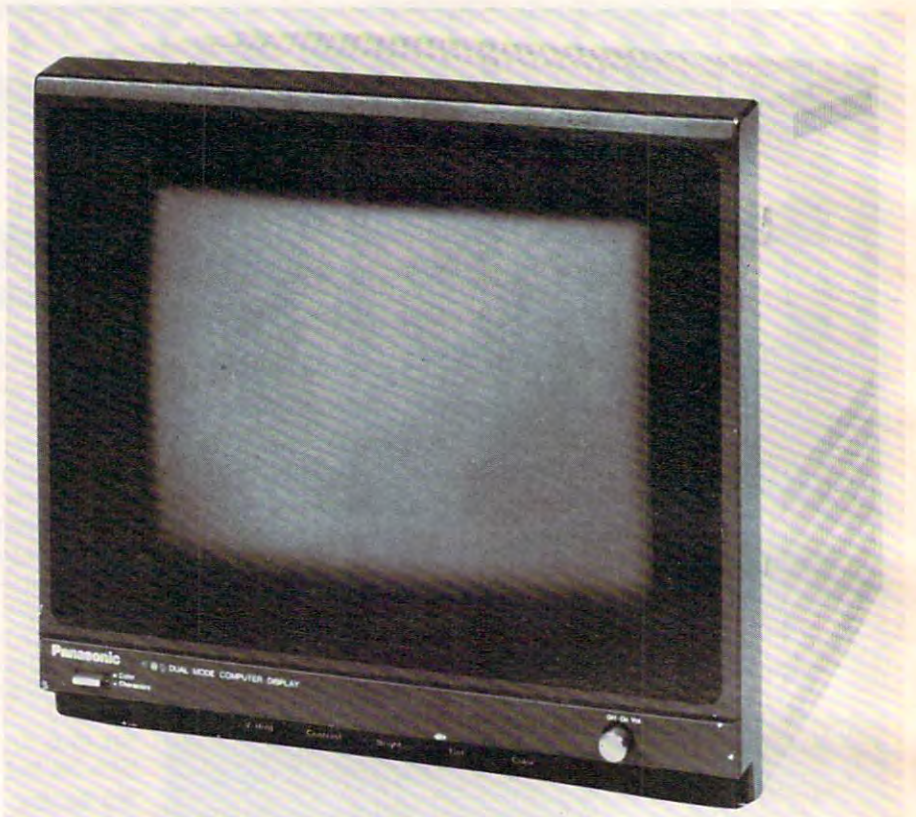
veloped matter transmission device. The player must battle the guard droids through a labyrinth of rooms in a remote space colony before capturing the matter transmitter. Each time the game is played, the obstacles are different.

Probe One requires a 40K Atari 400/800, BASIC cartridge, and paddles or joystick. It sells for \$34.95.

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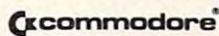


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A table is included to reference interests and computers to their owners.

For a free, permanent listing in the directory, send your name, address, computer type, interests, and state whether you are willing to trade information with other personal computer owners. To receive the current issue and the next issue with your listing, send \$9.95 and the above information to:

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Commodore Announces Bilingual Keyboard For Microcomputers

Commodore Business Machines Limited, Scarborough, Ontario, and Creargie Inc., Montreal, have announced their bilingual keyboard and French word pro-

cessing software.

Jacques Brun of Creargie has designed a new character generator, and modified the keyboard of the Commodore 8000 series personal computers to be compatible with recent federal regulations and with the approval of Professional Software Inc., Mississauga, Ontario.

The name of the new program is "WordPro 4-Plus ML".

The word processing software, WordPro 4-Plus, has been translated and modified so that in using it, along with certain redesignated keys, the French characters appear on the screen – including capital letters with accents – and can be printed out on any letter quality printer. The WordPro manual has been rewritten to reflect the changes and is translated into French.

The keyboard, however, is not only bilingual but multilingual. In addition to French, character generator sets for German, Spanish and Italian have been created, all available with the same program and with the proper accents and marks for each of these languages. The plan is to market the four versions



Commodore bilingual keyboard for word processing



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Recreational Computing was the first and only personal computing magazine when it started in 1972 (it was called the *PCC Newspaper* back then). Bob Albrecht, David Thornburg, Isaac Asimov, Don Inman, Ramon Zamora, Robert Jastrow, Mac Oglesby, Adam Osborne – the list of authors reads like a Who's Who of microcomputing. These and many other authors contributed some of the finest articles about computers and now-classic games to the pages of *Recreational Computing*.

Last fall, *Recreational Computing* was merged into **COMPUTE!** and we are now offering available back issues. Whatever your interest, you'll find something here – from Spanish BASIC to Computers in Sports Medicine, from Future Fantasy Games to Robot Pets.

September 1974 A Practical, Low-cost Home/School Microprocessor System, The Computer Illiteracy Problem, Eight Games in BASIC

March 1975 Build Your Own BASIC, The Computer In Art, Biorhythms

March/April 1976 A TTY Game, Games With The Pocket Calculator, Dodgem, Square, Tiny BASIC To Go

July 1976 BASIC Music, Tiny Trek For Altair, 16 Bit Computer Kit, Musical Numbers Guessing Game, Programmer's Toolbox

September/October 1976 Computer Games In The Classroom, Planets Game, Dungeons And Dragons, Hats Game, Pythagoras And Rational Music

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January/February 1978 Pascal Vs. BASIC, COMAL: Structured BASIC, Video Disks, Magic Lamps for Educators?, A Computer Revolution?, Pounce, The Mechanics of Robots, TRS-80: A Status Report

March/April 1978 Epic Computer Games, Micros for the Handicapped, Buckets Game, Prayer Wheel Program, Computer Contagion, Measuring Time, Frog Race, The IBM 370 Model 69

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January/February 1979 A Jules Verne Fantasy, Artificial Intelligence, The Apple Corps is With Us, TRS-80 Personal Software, Vending Machine Gets "Brain", Apple II I/O, The Memory Game, REINO: Spanish Kingdom

March/April 1979 Calculator Comics, "Lord of the Rings," Chess Reconsidered, Database, Beastly, Color Your Own Graphics, Universe, Easy POKing with Applesoft BASIC, Air Raid, TRS-80 3-D Plots, Slot, Apple Rose

May/June 1979 PILOT for Apple II, The Game of Life, Gold Handcapping, Hunt, BASIC vs. Pascal, Inspector Clew-so, Flash for SOL, Faster Jumble, Concept Sans Computer, A Beginner's Guide To FRP

July/August 1979 Summer Fun, Fooling Around With Your PET, Cryptarithms, Baseball, Newell Axl's Goat, Zork: A Computerized Fantasy Simulation Game, What Light on Yonder Panel Flashes, The Dedicated Word Processor, The FORTE Music Programming Language

September/October 1979 TRS-80: Outside Connection, The Architecture of Multi-Player Games, The Sounds of Texas Instruments, Dynamic Color Graphics on the New Atari, An Apple PILOT, Gandalf, Spanish BASIC, Designing Animal Games, APL Mastermind

November/December 1979 SHOGI: Games For You To Program, Atari Sounds, Texas Instrument Graphics and Animation, Interrupt, Match Me, Calendar, Making Music on the PET, Tower of Hanoi, Bingo, Animal Games

January/February 1980 Computing and Holistic Health, TI Graphics and Animation Part 2, Games To Program, New Directions in Numerical Computing, An Extended BASIC "IF" Facility, Beating Computer Anxiety, Capture for PET, 8080 Tic Tac Toe, Chainwalk, Programming Problems

March/April 1980 Special Games Issue: Recreation Apple II Hi-res Graphics, Delicious Functions, Galaxy II, Fairy Chess, Raging Robots, Program Instruction Builder, Data Retrieval: An Introduction

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Articles appearing in journals, trade publications and magazines are categorized, grouped and described for easy retrieval. A one-line bold-face statement gives the thrust of the article. This is followed by its title, some highlights, the number of illustrations, and the number of pages.

Survey consists of three sections. The section on personal computers is mainly for the non-engineering personal computer user. It includes program listings and reviews of disks.

The second section is mainly for the engineering reader. It indexes articles on chips, circuits, design, construction, etc.

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Advertisers Index

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AB Computers	111,148,149	Micro World Electronix Inc.	157
Abacus Software	158	Micro-Ed. Inc.	103
Academy Software	157	Micrograms Incorporated	99
Advanced Computing Enterprises	179	MicroSpec Ltd.	177
Adventure International	19	Micro-Systems	43
Albany Typewriter & Computer	83	Mideastern Software	188
The Alien Group	109	Midwest Micro Associates	145
American Peripherals	71	Mooseware Incorporated	224
Amplify, Inc.	140	Mosaic Electronics	41
Anthro Digital Software	192	New England Electronics Company	88,89
Artworx Software Company, Inc.	25	Nudmehi Software	161
Atari Inc.	7	Nufekop	133
BANK, Inc.	211	Olympic Sales Co.	230
B.I.G. Software	83	On Line Computer Centers of OKC	167
Batteries Included	39,105	On Line Software	147
Brøderbund Software	22,23	Optimized Data Systems	59
Business Computer Systems of New England	198	Optimized Systems Software, Inc.	181
C-Mart	229	Optomam Consumer Products	220
CE Software	179	PLON, Inc.	190
CFI	171	P. R. Software	201
Color Computer Concepts	91	P.R.I.C.E.	85
Canadian Micro Distributors Ltd.	61	Pacific Exchanges	34,105,196,226
Comm'Data Systems, Inc.	111	Percom Data Company, Inc.	15
Commodore Business Machines	12,13	Peripherals Unlimited	81
Compu Sense	198,200,235	PractEd Tapes, Inc.	85
ComputAbility	158	Precision Technology, Inc.	201
CompuShack	219	Pretzelland Software	169
The Computer Bus	59	Professional Software	19
Computer House, Division of F.L.C. Inc.	202	The Program Store	52,53
Computer Magic Ltd.	35	The Programmer's Institute	93,95
Computer Mail Order	216,217	Protecto Enterprises	221
Computer Marketing Services Inc.	195	Quality Software	77
Computer Outlet	237	Quantum Data, Inc.	143
Computer Outpost	227	Quicksoft	214
Computer World	69	Rapidwriter	147
COMPUTERforce	129	Reston Software	30
ComputerMat	176	Royal Software	225
Computertime, Inc.	169	SEI	105
Comstar	232	SJB Distributors, Inc.	233
Cosmic Computers Unlimited	229	Sax	201
Cow Boy Computing	111	Skyles Electric Works	137,175,203
Creative Software	73	Small Systems Engineering	64,65
DBM Enterprises	220	Soft Secre	59
Data 20 Corporation	37	Soft Unlimited	218
Dataport	188	SOF-TEC	126
Datasoft	45	The Software Connection	231
Digital Interface Systems Co.	74	Software Galore	218
Don't Ask Computer Software	67,93	Software Street	83
Dynacomp, Inc.	78,79	Solidus International Corp.	165
Dynamic Technologies	129	Solutions	190
Eastern House Software	196,227	Spellmaster Systems Software	172
Educational Software Inc.	57	Spinnaker Software	23
Elcomp Publishing, Inc.	222	Sport 'N' Sound	223
Embassy Computer Products	220	Ström Systems Inc.	235
English Software Company	91	subLOGIC Communications Corp.	33
Falk Baker Associates	221	Sunshine Peripherals	147
First Star Software Inc.	BC	Swiftly Software, Inc.	51
Foxfire Systems, Inc.	140	Syncro Inc.	47
Gebelli Software Inc.	48	T.H.E.S.I.S.	107
Gloucester Computer Bus Co.	147	TIS Inc.	105
GOSUB International, Inc.	146	TOTL Software	157
HW Electronics	55	TSASA, Inc.	234
Harli Software	157	Tara Computer Products	95
Hayden Book Company, Inc.	75	Taylor-made Software	172
Hayes Microcomputer Products, Inc.	11	Telegames	200
High Country Microsystems	77	Tiny Tek, Inc.	169
R. E. Huffman	176	Toronto PET Users Group	196
Human Engineered Software	21	United Microware Industries, Inc.	4
IDSi	31	University Microfilms	203
In Home Software	29	Vervan	179
Intec Peripherals Corp.	160	Victory Software Inc.	123,140
Intelligent Software	157	Voicetek	87
Interesting Software	177	Voyager Software	85,177
International Computer Center	160	Wadsworth Electronic Publishing Company	131
JV Software, Inc.	27	Wunderware	176
Jini Micro Systems, Inc.	192		
Kilo Corporation	163		
Krell Software Corp.	91		
Leading Edge Products, Inc.	18		
Lightning Software	200		
Little Wizard Distributing	239		
Lycor Computer Marketing & Consultants	145		
MIS	177		
ML Software	87,91		
MMG Micro Software	228		
MTG Technical Sales	226		
Macratronics, Inc.	203		
Metron Computer Systems	59		
Micro Computer Service Center			

COMPUTE! Publications

COMPUTE! Back Issues	213
COMPUTE! Customer Service	179
COMPUTE! Magazine	17
COMPUTE!'s Second Book of Atari	183
Every Kid's First Book of Robots and Computers	123
Programming the PET/CBM	197
Recreational Computing Back Issues	238

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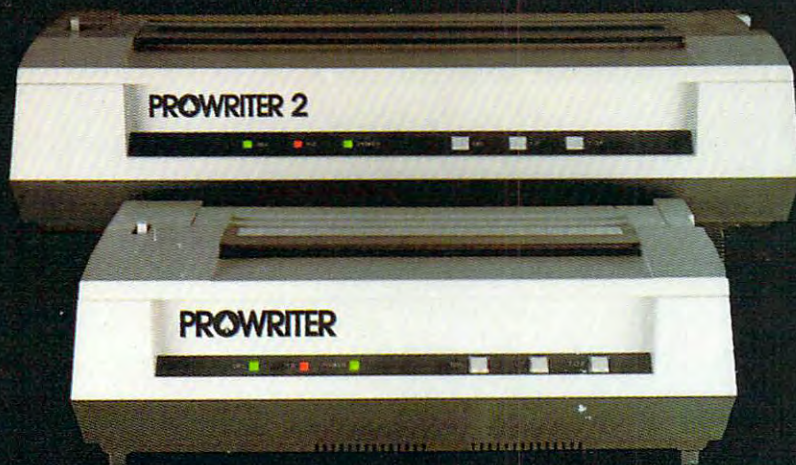
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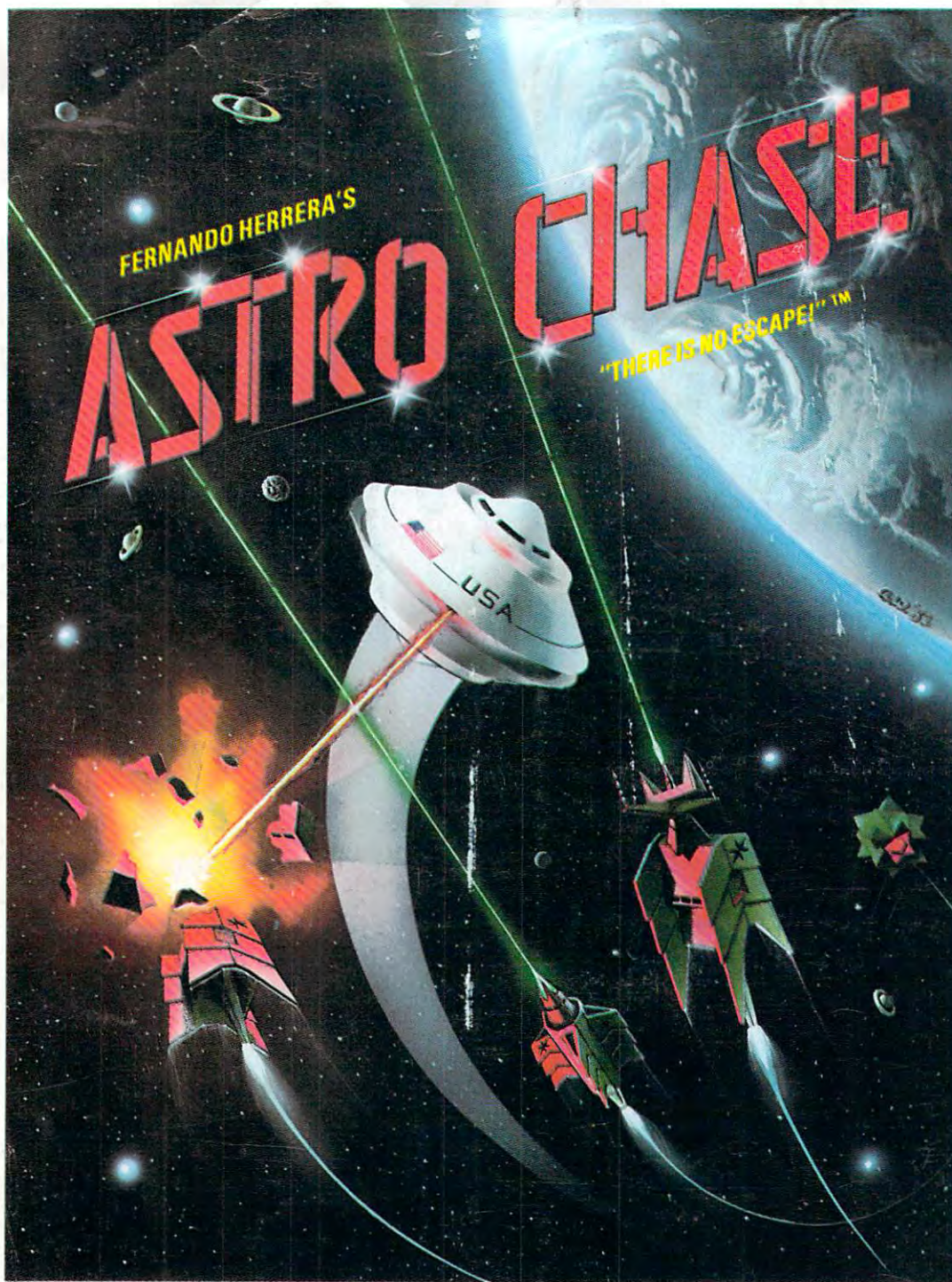


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