

COMPUTIST

Issue 51

January 1988

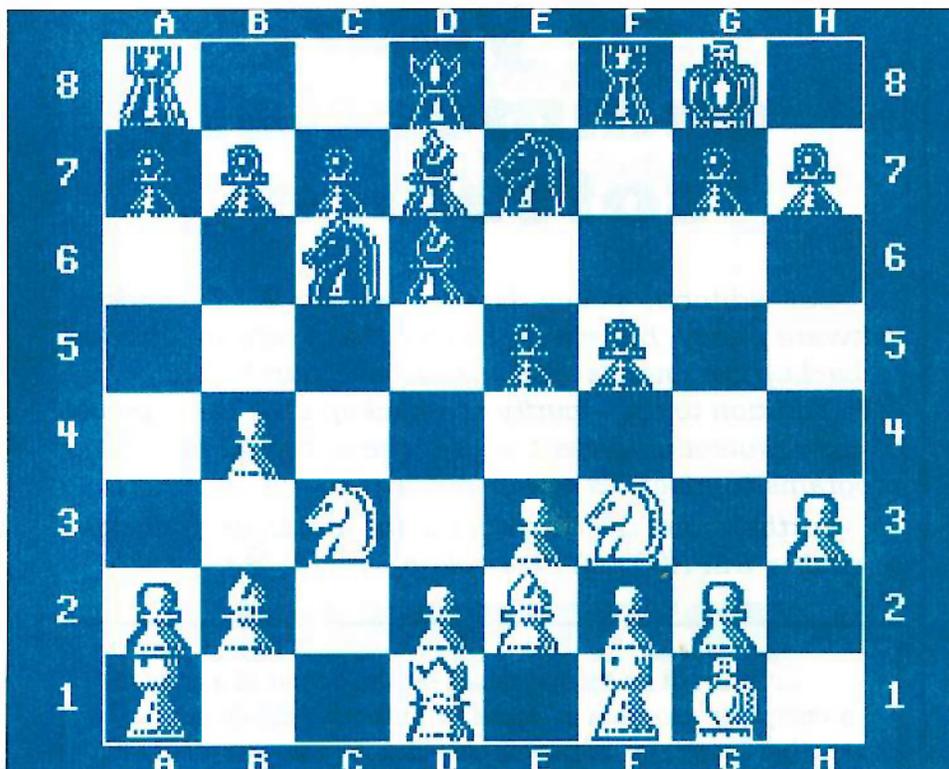
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Features:

- Kevin Lepard's
Cryptarithmic Helper
- Paul Johnson's
**A.P.T. for Bard's Tale.
Dungeon Mapper Revisited**
- Matt Ownby's
A.P.T. for Ultima IV
- Carole Fox's
A.P.T. for Might & Magic
- Ralph Augenfeld's
RAMfactor mod for Laser 128
- John Weigley's
**Getting Better Sound by...
Using the cassette jacks**
- Making A Fast Boot Disk**



Softkeys:

2400 AD ◊ Aliens ◊ Alphabet Zoo ◊ Amnesia ◊ Bag Of Tricks ◊ Bard's Tale I ◊ Bard's Tale II ◊ Battle Cruiser ◊ Beach-head II ◊ Below The Root ◊ Black Magic ◊ Body Awareness ◊ Bridge 4.0 ◊ Carriers At War ◊ Catalyst 3.0 ◊ Centipede ◊ Championship Boxing ◊ Championship Wrestling ◊ Chessmaster 2000 ◊ Combining The Elements ◊ Commando ◊ Creative Contraptions ◊ Einstein Compiler ◊ Fat City ◊ Fight Night ◊ Flight Simulator v2.0 ◊ Fun with Direction ◊ GBA 2-On-2 Championship Basketball ◊ GraphicWriter v1.1RA ◊ Growing Up Small ◊ House-on-a-disk ◊ Intrigue ◊ Jet ◊ Jungle Hunt ◊ Kindercomp ◊ Knowing Numbers ◊ Kung-fu Master ◊ Law Of The West ◊ Learning Well series ◊ Letters And Words ◊ Little Computer People ◊ Make Your Own Murder Party ◊ Manic Mansion ◊ Master Diagnostics ◊ Movie Maker ◊ Music Construction Set ◊ Pinball Construction Set ◊ Pitstop ◊ Print Shop Graphics Library Holiday ◊ Print Shop IIgs ◊ Rendezvous ◊ Shapes And Patterns ◊ Silent Service ◊ Sorcerer ◊ Spy vs Spy I & II ◊ Stargate ◊ Stellar 7 ◊ Stickybear ABCs ◊ Stickybear Drawing ◊ Stickybear Numbers ◊ Stickybear Printer ◊ Stickybear Printer Library I & II ◊ Stickybear Townbuilder ◊ Super Boulderdash ◊ Temple Of Apshai Trilogy ◊ Tomahawk ◊ Thexder ◊ Walt Disney's Card And Party Shop ◊ Walt Disney's Cartoon Maker ◊ Wings Of Fury ◊ Word Maze ◊ World's Greatest Baseball Game ◊ Zork III ◊ Apple IIgs softkey.

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Publisher-Editor: Charles R. Haight
Graphics Editor: Ben R. Haight
Circulation: Karen Fitzpatrick
Advertising: (206) 474-5750
Publishing: SoftKey
Printing: Valco Printing

● Address all advertising inquiries to: COMPUTIST; Advertising Department; PO Box 110816; Tacoma, WA 98411

● Mail all RDEX data-letters to:
COMPUTIST RDEX
PO Box 110846-K
Tacoma, WA 98411

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U.S.—\$32 U.S. 1st Class—\$45
Canada/Mex.—\$45 Other Foreign—\$75

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Diary

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And the first thing

I did today was...

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Welcome to 1988

Well it's 1988 and I have some new year resolutions. Of course, like any good busybody, I've made these resolutions for you.

New Year's Resolutions

- I won't send original or copies of original disks.
The originals may be lost and it's illegal for us to have copies.
- I will send all my letters to RDEX, on disk.
You'll get the disk back along with an advance copy of your piece of the issue. And it helps speed up completion of the magazine.
- I will write my letters in the same format as the letters I read in RDEX. Except for drawing the boxes or printing my name in inverse.
- I will always identify the computer I am writing about (IIC, IIE, IIGS, etc.).
- I will always include the publisher's name along with any program name I mention.
- I will always send BASIC programs and Super IOB controllers on disk.
Please!

BUGS:

COMPUTIST #47, page 34. "Improving Locksmith's Fast Backup".

It should read Sector edit track \$09, sector \$07.

COMPUTIST #36, page 27.

The hex dump for LC LOADER is missing the last byte.
The bottom line should read: 2100: 00 21 21 0F 0B F9 F3

Softkeys:

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* Apple IIgs softkey.
† Softkey requires some other issue of COMPUTIST or is incomplete as published.

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RAMfactor mod for Laser 128.17

Ralph Augenfeld's 'how-to' keep your RAMfactor alive with just a few hardware changes.

A.P.T for Ultima IV.....21

Matt Ownby's APT tables plus your sector editor will put you in charge of even the IIgs Ultima.

The Product Monitor.....22

Jeff Hurlburt continues his reviews with *Deluxe Paint II*, *Welcome*, *Create A Calendar*, *Diversi-Cache* and *Accolade's Comics* plus quick notes on *Invisi-Clues*, *Clip Art Gallery 1*, *Destroyer*, *The Spy's Adventures In N. America*, *Homework Helper: Math Word Problems*.

Get Better Sound by using the cassette jacks.....26

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Making A Fast Boot Disk.....26

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APT for Might & Magic.....28

Carole Fox's tables and your sector-editor will help you reach the Inner Sanctum.



Readers Data

For serious users of Apple computers: II, II+, //c, //e, IIGs, etc...

New COMPUTIST readers using Apple IIs are advised to read this page carefully to avoid frustration when attempting to follow a softkey or entering the programs printed in this issue.

What is a softkey, anyway?

Softkey is a term which we coined to describe a procedure that removes, or at least circumvents, any copy-protection on a particular disk. Once a softkey procedure has been performed, the resulting backup copy can usually be copied by the normal copy programs (for example: COPYA, on their DOS 3.3 System Master disk).

Commands and control keys

In any article appearing in COMPUTIST, commands which a reader is required to perform are set apart by being in boldface and on a separate line. The **RETURN** key must be pressed at the end of every such command unless otherwise specified. Control characters are specially boxed. An example of both is:

6 **Ⓟ**

Press **6**. Next, place one finger on the **Ⓞ** key and then press **P**. Remember to enter this command line by pressing **RETURN**.

Other special combination keypresses include **ⓄRESET** or **ⓄⓄRESET**. In the former, press and hold down **Ⓞ** then press **RESET**. In the latter, press and hold down both **Ⓞ** and **Ⓞ** then press **RESET**.

Special requirements

Special prerequisites for COMPUTIST articles, programs and softkeys are usually listed at the start under "■ Requirements:".

Software recommendations

- ✓ Applesoft program editor such as *Global Program Line Editor (GPLE)*.
- ✓ Sector-editor such as *DiskEdit* (in the *COMPUTIST Starter Kit*) or *ZAP* from *Bag of Tricks*.
- ✓ Disk-search utility such as *The Inspector*, the *CIA* or the *Core Disk Searcher* (in the *COMPUTIST Starter Kit*).
- ✓ Assembler such as the *S-C Assembler* from S-C software or *Merlin/Big Mac*.
- ✓ Bit-copy program such as *Copy II Plus*, *Locksmith* or *Essential Data Duplicator (EDD)*.
- ✓ Text-editor (that produces normal

sequential text files) such as *Applewriter II*, *Magic Window II* or *Screenwriter II*.

✓ *COPYA*, *FID* and *MUFFIN* from the *DOS 3.3 System Master* disk are also useful.

Super IOB and Controllers

This powerful deprotection utility (in the *COMPUTIST Starter Kit*) and its various Controllers are used in many softkeys. (It is also on each *Super IOB Collection* disk.)

Reset into the Monitor

Softkeys occasionally require the user to stop the execution of a copy-protected program and directly enter the Apple's system monitor. Check the following list to see what hardware you will need to obtain this ability.

Apple II+, //e, compatibles: 1) Place an Integer BASIC ROM card in one of the Apple slots. 2) Use a non-maskable interrupt (NMI) card such as *Replay* or *Wildcard*.

Apple II+, compatibles: 1) Install an F8 ROM with a modified reset-vector on the computer's motherboard as detailed in the *Modified ROM's* article (*COMPUTIST #6* or *Book Of Softkeys III*) or the *Dual ROM's* article (*COMPUTIST #19*).

Apple //e, //c: Install a modified CD ROM on the computer's motherboard. Cutting Edge Ent. (Box 43234 Ren Cen Station-HC; Detroit, MI 48243) sells a hardware device that will give you this important ability but it will void an Apple //c warranty.

Recommended literature:

- ✓ *Apple II Reference Manual*
- ✓ *DOS 3.3 manual*
- ✓ *Beneath Apple DOS*, by Don Worth and Pieter Lechner, from Quality Software
- ✓ *Assembly Language For The Applesoft Programmer*, by Roy Meyers and C.W. Finley, from Addison Wesley

Keying in Applesoft programs:

BASIC programs are printed in a format that is designed to minimize errors for readers who key in these programs. If you type:

10HOME:REMCLEAR SCREEN

The LIST will look like:

10 HOME : REM CLEAR SCREEN

...because Applesoft inserts spaces into a program listing before and after every command word or mathematical operator. These spaces

usually don't pose a problem except in line numbers which contain REM or DATA commands. There are two types of spaces: those that have to be keyed and those that don't. Spaces that must be typed appear in COMPUTIST as delta characters (^). All other spaces are there for easier reading. NOTE: If you want your checksums (See **Computing checksums**) to match up, you must key ONLY the ^ spaces after DATA statements.

Keying In Hexdumps

Machine language programs are printed in COMPUTIST as hexdumps, sometimes also as source code. Hexdumps are the shortest and easiest format to type in. You must first enter the monitor:

CALL -151

Key in the hexdump exactly as it appears in the magazine, ignoring the four-digit checksum (\$ and four digits) at the end of each line. A beep means you have typed something that the monitor didn't understand and must, therefore, retype that line.

When finished, return to BASIC with:

3D0G

BSAVE the program with the filename, address and length parameters given in the article.

Keying in source code

The source code is printed to help explain a program's operation. To key it in, you will need the *S-C Assembler* or you will have to translate pieces of the source code into something your assembler will understand (see table of *S-C Assembler* directives in *COMPUTIST #17*).

Computing checksums

Checksums are 4-digit hexadecimal numbers which tell if you keyed a program exactly as it appears in COMPUTIST.

There are two types of checksums: one created by the *CHECKBIN* program (for machine language programs) and the other created by the *CHECKSOFT* program (for BASIC programs). Both appeared in *COMPUTIST #1* and *The Best of Hardcore Computing*. An update to *CHECKSOFT* appeared in *COMPUTIST #18*.

If the published checksums accompanying program listings and hexdumps do not match those created by your computer, then you typed the program incorrectly. The line where the first checksum differs has an error.

EXchange



who want all their software backed up and COPYA-able

CHECKSOFT instructions:

LOAD filename
BRUN CHECKSOFT

Get the checksums with: and correct the program line where the checksums differ.

CHECKBIN instructions:

CALL -151
BLOAD filename

Install CHECKBIN at an out of the way place
BRUN CHECKBIN, A\$6000

Get the checksums by typing the Starting address, a period and the Ending address of the file followed by a .

SSS.EEE

Correct the lines at which the checksums differ.

Steve Herrington

More praise for Clay Harrel's Senior Prom v3.0

Although he receives it from just about everyone, I would like to add my praise for Mr. Clay Harrell and his Senior Prom v3.0. He's fixed all the problems with the first versions and it's now a superb piece of hardware all your readers should get.

On top of it all, he provides unmatched service support and technical advice. Although it took him a lot of extra time and reprogramming effort, he even got it working on my IIe clone. I can't praise this kind of support enough.

Scuzzy Port

Interchanging Fonts between

Elite, MultiScribe GS, & Deluxe Paint II

You can interchange fonts between *Writer's Choice Elite*, *MultiScribe GS*, and *Deluxe Paint II* by copying each font file to the /SYSTEM/FONTS/ subdirectory of the selected program disk.

Christopher Dean

† Softkey for...

Flight Simulator v2.0

SubLOGIC

I have *Flight Simulator v2.0* and by following the directions in *COMPUTIST #45*, I was able to make the corrections to the softkey for my copy. The corrections are listed below:

AE28:40
AE40:E8 C0
C0E9
AE22G

Sector Edit:

Trk	Sct	Byte(s)	From	To
\$09	\$0E	\$56-5E	?	all EA's

There is also a typo in the original softkey. The last byte of *LC LOADER* is not present (It is in the source code listing but not the hexdump), it should be an \$F3.

Now, the 48K version will work but the 64K will not. The reason for this is that version 2.0 uses more of the language card data than the softkey accounted for. It uses two extra memory pages (\$FA00-\$FB7B) for data. Fortunately, there are two blank sectors on track \$00 where the data can be kept and loaded in.

First, load the language card data into memory and write memory pages \$6A00 and \$6B00 to track \$00, sectors \$0A, and \$0B in that order.

Then, type the following code into track \$00, sector \$00. That's it.

The following routine checks for the RAM card itself and if there is one, copies ROM into it (so the boot will not crash) and reads sectors \$0A and sectors \$0B into it and continues with the boot.

```

$869- 4C 84 08
$884- 18 8A 6A 6A
$888- 6A 6A 09 C0 8D DC 08 8D
$890- EC 08 AD 83 C0 AD 83 C0
$898- A2 00 8E 00 D0 EC 00 D0
$8A0- D0 4B CA D0 F5 AD 81 C0
$8A8- AD 81 C0 A0 03 A2 00 BD
$8B0- 00 FC 9D 00 FC E8 D0 F7
$8B8- EE B1 08 EE B4 08 88 D0
$8C0- EC AD 83 C0 AD 83 C0 A0
$8C8- 0A B9 6C 08 85 3D A9 00
$8D0- 85 26 85 41 A9 FA 85 27
$8D8- A6 2B 20 5C C6 A9 FB 85
$8E0- 27 A0 0B B9 6C 08 85 3D
$8E8- A6 2B 20 5C C6 A6 2B 4C
$8F0- 00 1D

```

Ray Grim

Softkey for...

Movie Maker

Electronic Arts

Thanks to John Wiegley (*COMPUTIST #48*) I was able to use my Sector Editor and change the bytes he suggested for *Artic Fox* on my program *Movie Maker* also from Electronic Arts.

Copy *Movie Maker* Program Disk Side A with a sector copier and ignore the errors.

when writing a letter to...



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- Address your letters to:
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- Although *COMPUTIST* can no longer purchase short softkeys and articles, please continue to contribute them but place them in a letter to the editor so that they get published in the RDEX as soon as possible.

—appleRDEXed

2 Make the following sector-edits:

Trk	Sct	Byte(s)	From	To
\$01	\$06	\$08	03	62
\$01	\$0A	\$5A	A9	EA
\$01	\$0A	\$5B	C5	EA

That's it. Now copy side B and disk 2 (Data Disk) with any copier.

Kevin Lepard

SEND + MORE MONEY

Recently in an artificial intelligence (AI) class, I was required to solve several cryptarithmic problems in order to illustrate several of the procedures in AI.

Cryptarithmic is a puzzle in which letters have been substituted for the numbers in a math problem.

The object is to substitute an integer from 0 to 9 for each letter so that the problem works correctly.

Obviously, each integer can be used only once in a problem.

After working my way through two of these problems manually, it was painfully obvious that most of the effort required to solve cryptarithmic problems was in constantly recalculating variables and checking to make sure that an integer had not been used twice.

Being a busy college student who greatly prefers activities other than slaving over cryptarithmic, I quickly decided that my Apple would take on the job of helping me solve cryptarithmic. A short while later the *Cryptarithmic Helper* emerged.

The

Cryptarithmic Helper

The *Cryptarithmic Helper* aids in solving cryptarithmic problems by:

1 Applying heuristics (basically a 'rule of thumb') to the initial problem to aid in the restriction of variables.

2 Calculating possible values for remaining variables from the user input.

3 Preventing multiple variables from possessing the same integer.

4 Detecting errors in either column-sums or column-carries.

5 Aiding in the easy change of values and column-carries, with appropriate recalculation of possible values.

To use *Cryptarithmic Helper*, first type in the Applesoft listing, then save it with the command:

SAVE CRYPTARITHMETIC HELPER

or some shorter file name, if you find that too long.

In the following notes on *Cryptarithmic Helper*, references to rows and columns are as shown in the following problem:

```

5 4 3 2 1 .....Column Number
? ? ? ? 0 .....Carry Values
S E N D .....Row #1
M O R E .....Row #2
M O N E Y .....Row #3
    
```

Column-Carries

Also, the phrase "the carry of column X" (where X is any column) refers to the carry at the top of column X, not the carry generated by column X.

The Commands

- I -display initial variable restrictions
- R -restart program
- S -start over on current problem
- Q -quit program
- / or ? -get the help screen.

When *Cryptarithmic Helper* displays values for variables for which substitutions have not been made, it displays all possible numbers - not just integers - that would make the displayed mathematical statement true.

Cryptarithmic Helper may also display values that are already used in substitutions.

Non-integer values usually indicate that a carry for which there is sufficient information to set is not set, and serve as reminders to set carries, since it functions more effectively when the carries are set.

The display of used integers may be useful when values are not changed by the carries.

Cryptarithmic Helper also displays information such as: 8 = 8 or 9. This, too, indicates that a carry should be set. A version of *Cryptarithmic Helper* that prevented printing these was tested, but it was found that it could too often result in a problem that had substitutions made for all the variables that did not generate errors because carries were not set.

Information such as: 3 = 3 indicates that substitutions agree with the carries and no conflicts exist.

How To Use It

To enter a problem into *Cryptarithmic Helper*, type in the first, second, and third lines as they appear.

Cryptarithmic Helper does not work with cryptarithmic problems of more than 3 lines. In addition, the first and second lines must ADD to the third line.

If the problem is given as a subtraction problem, simply reverse it so that it is an addition problem. That is, if the problem appears as:

```

MONEY
-SEND
-----
MORE
    
```

Change it to:

```

SEND
+MORE
-----
MONEY
    
```

Also, when typing in the problem, do not include the operator, i.e. the + or - sign.

For the problem given above, the first line would be entered **SEND**, the second line **MORE**, and the third line **MONEY**.

Cryptarithmic Helper accepts either upper or lower case letters, but all the letters must be the same case, otherwise the substitution routine will not work.

To assign a value to a character, press that character and then the value you wish to assign it. If you try to assign a value to a character that has already been assigned, the program will beep and restart the "Take a guess" routine.

Cryptarithmic Helper will not accept attempts to assign non-numerical symbols to variables.

To assign a value to a carry, press the column number of the carry you wish to assign and then the value you wish it to have, either 0 or 1. You cannot assign numbers other than 0 or 1 to carries, and the program will not accept attempts to do so.

To return a carry or variable to its initial state, press the variable or the column of the carry and then press **RETURN**.

How It Works

The first thing that *Cryptarithmic Helper* does is set a normal height text window (**POKE 34,0**), clear it (**HOME**), display the help screen (**GOSUB 1800**), then reset and reclear the text screen (the second **POKE 34,0:HOME**)

Its second step is to take the input problem, make sure that none of it is simply a carriage return, and check it for internal spaces.

The program does this in lines 150—260. If an internal space is found, or a row is entered as just a **RETURN**, the program asks for the row to be re-entered.

R1\$, R2\$, and R3\$ contain the rows 1, 2, and 3, respectively.

Line 300 sets NC (for number of columns) to the longest row. Obviously the third row has to be as long or longer than the other two rows, so NC is always equal to the LEN(R3\$).

Line 340 makes sure that the problem is not obviously unsolvable by checking to see that the length of row 1 or 2 is not longer than row 3, or that or 3 is not more than 1 letter longer than rows 1 or 2.

Lines 380—510 pad all the strings to the same length, for convenience in applying the initial heuristics. For every letter the string is shorter than NC, a space is added at the beginning. T\$ is a dummy string used to hold the number of spaces to add to the rows. T\$ is set to " " at the start of the routine and set to "" when the routine is exited.

Lines 550—630 do the initial display. Line 560 prints "?" over all the carries except the carry for column 1, which is obviously always 0, and therefore displays a 0 there.

The problem is displayed twice. The problem on the left is the problem in its start state, which is useful for reference. It remains unchanged during the work period. The problem on the right displays the problem in its current state, with appropriate substitutions.

All the letters are **POKE**d directly onto the screen so that *Cryptarithmic Helper* will function properly in either 40 or 80 columns.

Lines 670—770 are responsible for detecting any information in the initial problem that can restrict variables. Line 670 sets the top of the text window to below the problem and clears it with **HOME**. Lines 680 and 770 are responsible for looping through all the columns so that they are all checked for variable restrictions. Line 690 set L - for converted column - to the offset necessary to **PEEK** the values in memory.

Lines 700—760 print any restrictions that are found. This routine checks only unchanging left problem, so that the initial variable restrictions may be redisplayed at any time.

Lines 810—1000 take guesses and *Cryptarithmic Helper* commands. Line 810 sets the text window to near the bottom of the screen so that no information above will be destroyed. Line 820 takes the input, and lines 830—880 check to see if it is a command.

Line 890 checks to see if the user wishes to assign a value to a variable or a carry of an existing column. If it is a carry the program performs a **GOTO 1100**, otherwise it continues.

Lines 900—940 check through the rows to make sure that the variable is in the problem. If the variable is not in the problem, it restarts the "Take a guess" routine. If the variable is

found, it asks for the value - V\$ - with which to replace the letter.

Lines 990—1000 check to make certain that the input value is an integer or a carriage return if it is an integer, the program checks for conflicts. If it is a **RETURN**, the program reinserts the character into the problem with substitutions by performing a **GOTO** to the "Reinsert letters" routine at lines 1190—1270.

Lines 1040—1080 check for conflicts before substituting the variable on-screen by **PEEK**ing the screen locations, converting that value to an ASCII code, and checking to see if its value equals V\$ and that the character for which the value has replaced is the same as that for which V\$ is to replace. That is CHR(PEEK(X + 20) - 128) = V$$ sees if what is on the screen in the problem with the substitutions equals V\$ and $PEEK(X) - 128 <> ASC(LT$)$ sees if the character in the problem without the substitutions is the same as LT\$. If these conditions are true, then that variable value is used, and the "Take a guess" routine restarts. Otherwise the program does a **GOTO** to the "Insert letters and carries" routine at lines 1310—1380.

Lines 1110—1150 take carry substitutions. If the value is not a legitimate carry value (i.e., 0 or 1) the program asks for a different value. If the value is legitimate, it does a **GOTO** to "Insert letters and carries" at 1310—1380.

The "Insert letters and carries routine," lines 1310—1380, finds the character in LT\$ by **PEEK**ing the screen locations on the problem without substitutions and **POKE**ing V\$ into the same place on the problem with substitutions. The program then enters the "Calculate Possible Values" routine.

Lines 1420—1790 calculate possible values for variables that have not had a substitution made, and checks for conflicts in the information for which substitutions have already been made. Line 1420 sets the text window below the displayed problem and clears it with **HOME**.

In this routine, A\$, B\$, X\$, Y\$, and Z\$ contain the characters found in the carry of the next column, the carry of the column, the first row, the second row, and the third row, respectively. A, B, X, Y, Z contain ASCII values of A\$, B\$, X\$, Y\$, and Z\$, respectively. Lines 1540—1580 assign actual numerical values to A, B, X, Y, and Z if they represent values and not characters. If A, B, X, Y, and Z all are numbers, then line 1590 checks to make sure they add properly. If they do, then the program performs a **NEXT C** to start checking the next column. Lines 1600—1660 check for errors in the previously substituted data, and lines 1670—1780 offer suggestions on possible values for variables for which no substitutions have been made if possible. Lines 1590—1780 work by checking preconditions and then calculating possible values based upon

those conditions. A check such as $X = VAL(X$)$ is true if X and X\$ are the same integer with X in integer form and X\$ in string form.

Lines 1830—1900 print the help screen.

The Variables

- A —carry from the next column.
- A\$ —character in carry from the next column.
- B —carry from the column.
- B\$ —character in carry from the next column.
- C —miscellaneous counter.
- L —converted column containing screen offset.
- LT\$ —the letter or column that is to have a value assigned it.
- NC —number of columns.
- R1\$ —row 1.
- R2\$ —row 2.
- R3\$ —row 3.
- V\$ —value to assign what is contained in LT\$.
- X —general counter, or value from first row of problem.
- X\$ —character from first row of problem.
- Y —value from second row of problem.
- Y\$ —character from second row of problem.
- Z —value from third row of problem.
- Z\$ —character from third row of problem.

Start With These Problems

SEND +MORE	DONALD +GERALD	CROSS +ROADS
MONEY	ROBERT	DANGER

If you really want to convince yourself that the *Cryptarithmic Helper* does help, try solving one by hand first.

If anyone discovers more initial heuristics or makes any interesting modifications to this program, I would be interested in knowing what they are.

CRYPTARITHMETIC HELPER

```

10 REM *****
20 REM *
30 REM *      CRYPTARITHMETIC HELPER      *
40 REM *
50 REM *      BY KEVIN LEPARD              *
60 REM *
70 REM *****
80 REM
90 REM SET NORMAL HEIGHT TEXT WINDOW, SHOW HELP
   SCREEN
100 REM
110 POKE 34,0: HOME: GOSUB 1800: POKE 34,0: HOME
    
```



```

120 REM
130 REM TAKE INPUT PROBLEM
140 REM
150 HOME : INPUT "ENTER^THE^FIRST^LINE^" ;R1$
160 FOR C = 1 TO LEN (R1$) : IF MID$ (R1$,C,1) =
  "" THEN 150
170 NEXT C
180 IF R1$ = "" THEN 150
190 HOME : INPUT "ENTER^THE^SECOND^LINE^" ;R2$
200 FOR C = 1 TO LEN (R2$) : IF MID$ (R2$,C,1) =
  "" THEN 190
210 NEXT C
220 IF R2$ = "" THEN 190
230 HOME : INPUT "ENTER^THE^THIRD^LINE^" ;R3$
240 FOR C = 1 TO LEN (R3$) : IF MID$ (R3$,C,1) =
  "" THEN 230
250 NEXT C
260 IF R3$ = "" THEN 230

270 REM
280 REM SET THE NUMBER OF COLUMNS TO THE LONGEST
  ROW
290 REM
300 NC = LEN (R3$)

310 REM
320 REM MAKE SURE IT ISN'T OBVIOUSLY UNSOLVABLE
330 REM
340 IF NC > LEN (R1$) + 1 OR NC > LEN (R2$) +
  1 OR LEN (R1$) > NC OR LEN (R2$) > NC THEN
  PRINT : PRINT "YOU^HAVE^ENTERED^AN^
  UNSOLVABLE^PROBLEM." : PRINT : PRINT
  "PRESS^ANY^KEY^TO^RESTART" : PRINT : GET
  JK$: GOTO 10

350 REM
360 REM PAD THE STRINGS TO ALL THE SAME LENGTH
370 REM
380 IF NC = 1 THEN 510
390 T$ = ""
400 IF NC - LEN (R1$) <= 0 THEN 460
410 FOR C = 1 TO NC - LEN (R1$)
420 T$ = T$ + ""
430 NEXT C
440 R1$ = T$ + R1$
450 T$ = ""
460 IF NC - LEN (R2$) <= 0 THEN 510
470 FOR C = 1 TO NC - LEN (R2$)
480 T$ = T$ + ""
490 NEXT C
500 R2$ = T$ + R2$
510 T$ = ""

520 REM
530 REM DO THE INITIAL DISPLAY
540 REM
550 POKE 34,0: HOME
560 IF NC > 1 THEN FOR C = 1 TO NC - 1: POKE 1024
  + 20 + C, ASC ( "?" ) + 128: NEXT C: POKE 1024
  + 20 + NC, ASC ( "0" ) + 128
570 IF NC = 1 THEN POKE 1024 + 21, ASC ( "0" ) + 128
580 FOR C = 1 TO NC
590 POKE 1280 + C, ASC ( MID$ (R1$,C,1) ) + 128:
  POKE 1280 + C + 20, ASC ( MID$ (R1$,C,1) ) +
  128

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600 POKE 1408 + C, ASC ( MID$ (R2$,C,1) ) + 128:
  POKE 1408 + C + 20, ASC ( MID$ (R2$,C,1) ) +
  128
610 POKE 1536 + C, ASC ( "-" ) + 128: POKE 1536 +
  C + 20, ASC ( "-" ) + 128
620 POKE 1664 + C, ASC ( MID$ (R3$,C,1) ) + 128:
  POKE 1664 + C + 20, ASC ( MID$ (R3$,C,1) ) +
  128
630 NEXT C

640 REM
650 REM PERFORM INITIAL VARIABLE RESTRICTION
660 REM
670 POKE 34,7: HOME
680 FOR C = 1 TO NC
690 L = ABS (NC - C + 1)
700 IF C = NC AND MID$ (R1$,L,1) = "" AND MID$
  (R2$,L,1) = "" THEN PRINT MID$ (R3$,L,1)
  "=1^&^THE^CARRY^OF^COLUMN^" NC "A^S^1"
710 IF MID$ (R1$,L,1) = MID$ (R2$,L,1) AND MID$
  (R1$,L,1) = MID$ (R3$,L,1) THEN PRINT MID$
  (R1$,L,1) ; "A^S^0^&^CARRY^OF^COLUMNS^" ; C;
  "AND^" ; C + 1; "ARE^0" : GOTO 770
720 IF MID$ (R1$,L,1) = MID$ (R3$,L,1) AND C <
  > 1 THEN PRINT MID$ (R2$,L,1) "=0^&^
  CARRY^OF^COLUMNS^" ; C; "8^" ; C + 1; "ARE
  ^0^OR" : PRINT "9^&^CARRY^OF^ COLUMNS^"
  ; C; "8^" ; C + 1; "ARE^1"
730 IF MID$ (R2$,L,1) = MID$ (R3$,L,1) AND C <
  > 1 THEN PRINT MID$ (R1$,L,1) "=0^&^
  CARRY^OF^COLUMNS^" ; C; "8^" ; C + 1; "ARE^
  0^OR" : PRINT "9^&^CARRY^OF^ COLUMNS^" ; C;
  "8^" ; C + 1; "ARE^1"
740 IF MID$ (R1$,L,1) = MID$ (R3$,L,1) AND C =
  1 THEN PRINT MID$ (R2$,L,1) "=0^&^CARRY^
  OF^COLUMN^2^IS^0"
750 IF MID$ (R2$,L,1) = MID$ (R3$,L,1) AND C =
  1 THEN PRINT MID$ (R1$,L,1) "=0^&^CARRY^
  OF^COLUMN^2^IS^0"
760 IF MID$ (R1$,L,1) = MID$ (R2$,L,1) AND C =
  1 THEN PRINT MID$ (R3$,L,1) "IS^EVEN."
770 NEXT C

780 REM
790 REM TAKE A GUESS
800 REM
810 POKE 34,22: HOME
820 GET LT$
830 IF LT$ = CHR$ (17) THEN POKE 34,0: HOME : END
  : REM CTRL-Q QUILTS
840 IF LT$ = CHR$ (9) THEN 640: REM CTRL-I RE
  APPLIES INITIAL RULES
850 IF LT$ = "?" OR LT$ = "/" THEN GOSUB 1800: REM
  SHOW HELP SCREEN
860 IF LT$ = CHR$ (18) THEN GOTO 80: REM CTRL-R
  RESTARTS
870 IF LT$ = CHR$ (19) THEN GOTO 520: REM CTRL-S
  RESTARTS PROBLEM
880 IF LT$ = "" THEN 820
890 IF LT$ > "1" AND LT$ <= STR$ (NC) THEN GOTO
  1100
900 FOR C = 1 TO NC
910 IF MID$ (R1$,C,1) = LT$ THEN 960
920 IF MID$ (R2$,C,1) = LT$ THEN 960
930 IF MID$ (R3$,C,1) = LT$ THEN 960
940 NEXT C

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950 GOTO 820
960 PRINT LT$; "A=" ;
970 GET V$
980 IF V$ = CHR$ (13) THEN GOTO 1160
990 IF V$ < "0" OR V$ > "9" THEN 970
1000 PRINT V$

1010 REM
1020 REM CHECK FOR CONFLICTS
1030 REM
1040 FOR C = 1 TO NC
1050 IF CHR$ ( PEEK (1280 + 20 + C) - 128 ) = V$ AND
  CHR$ ( PEEK (1280 + C) ) < > LT$ THEN PRINT
  CHR$ (7) : GOTO 780
1060 IF CHR$ ( PEEK (1408 + 20 + C) - 128 ) = V$ AND
  CHR$ ( PEEK (1408 + C) ) < > LT$ THEN PRINT
  CHR$ (7) : GOTO 780
1070 IF CHR$ ( PEEK (1664 + C + 20) - 128 ) = V$ AND
  CHR$ ( PEEK (1664 + C) ) < > LT$ THEN PRINT
  CHR$ (7) : GOTO 780
1080 NEXT C
1090 GOTO 1280
1100 PRINT "CARRY^OF^COLUMN^" ; LT$; "A=" ;
1110 GET V$
1120 IF V$ = CHR$ (13) THEN GOTO 1160
1130 IF V$ < "0" OR V$ > "1" THEN 1110
1140 PRINT V$
1150 GOTO 1280

1160 REM
1170 REM REINSERT LETTERS
1180 REM
1190 IF ASC (LT$) - 48 < > VAL (LT$) THEN GOTO
  1220
1200 POKE 1024 + 20 + (NC + 1 - VAL (LT$)), ASC (
  "?" ) + 128
1210 GOTO 1390
1220 FOR C = 1 TO NC
1230 IF PEEK (1280 + C) - 128 = ASC (LT$) THEN POKE
  1280 + C + 20, PEEK (1280 + C)
1240 IF PEEK (1408 + C) - 128 = ASC (LT$) THEN POKE
  1408 + C + 20, PEEK (1408 + C)
1250 IF PEEK (1664 + C) - 128 = ASC (LT$) THEN POKE
  1664 + C + 20, PEEK (1664 + C)
1260 NEXT C
1270 GOTO 1390
1280 REM
1290 REM INSERT LETTERS AND CARRIES
1300 REM
1310 IF ASC (LT$) - 48 < > VAL (LT$) THEN GOTO
  1340
1320 POKE 1024 + 20 + (NC + 1 - VAL (LT$)), ASC
  (V$) + 128
1330 GOTO 1390: REM GOTO CALCULATE POSSIBLE
  VALUES
1340 FOR C = 1 TO NC
1350 IF PEEK (1280 + C) - 128 = ASC (LT$) THEN POKE
  (1280 + 20 + C), ASC (V$) + 128
1360 IF PEEK (1408 + C) - 128 = ASC (LT$) THEN POKE
  (1408 + 20 + C), ASC (V$) + 128
1370 IF PEEK (1664 + C) - 128 = ASC (LT$) THEN POKE
  (1664 + 20 + C), ASC (V$) + 128
1380 NEXT C
1390 REM
1400 REM CALCULATE POSSIBLE VALUES
1410 REM

```



```

1420 POKE 34,7: HOME
1430 FOR C = 1 TO NC
1440 A = PEEK (1024 + 21 + NC - C - 1) - 128
1450 B = PEEK (1024 + 21 + NC - C) - 128
1460 X = PEEK (1280 + 21 + NC - C) - 128
1470 Y = PEEK (1408 + 21 + NC - C) - 128
1480 Z = PEEK (1664 + 21 + NC - C) - 128
1490 A$ = CHR$(A)
1500 B$ = CHR$(B)
1510 X$ = CHR$(X)
1520 Y$ = CHR$(Y)
1530 Z$ = CHR$(Z)
1540 IF A - 48 = VAL (A$) THEN A = A - 48
1550 IF B - 48 = VAL (B$) THEN B = B - 48
1560 IF X - 48 = VAL (X$) THEN X = X - 48
1570 IF Y - 48 = VAL (Y$) THEN Y = Y - 48
1580 IF Z - 48 = VAL (Z$) THEN Z = Z - 48
1590 IF X = VAL (X$) AND Y = VAL (Y$) AND Z = VAL (Z$) AND A = VAL (A$) AND B = VAL (B$) AND X + Y + B = (10*A) + Z THEN GOTO 1790
1600 IF X = VAL (X$) AND Y = VAL (Y$) AND Z = VAL (Z$) AND A = VAL (A$) AND B = VAL (B$) AND X + Y + B < > Z + (10 * A) THEN PRINT "ERROR IN COLUMN":C: GOTO 1790
1610 IF X = VAL (X$) AND Y = VAL (Y$) AND Z = VAL (Z$) AND B = VAL (B$) AND C = NC AND X + Y + B = Z THEN GOTO 1790
1620 IF X = VAL (X$) AND Y = VAL (Y$) AND Z = VAL (Z$) AND B = VAL (B$) AND C = NC AND X + Y + B < > Z THEN PRINT "ERROR IN COLUMN":NC: GOTO 1790
1630 IF X$ = "" AND Y$ = "" THEN IF Z = VAL (Z$) AND Z < > 1 THEN PRINT "ERROR IN COLUMN":NC: GOTO 1790
1640 IF X = VAL (X$) AND Y = VAL (Y$) AND Z = VAL (Z$) AND A = VAL (A$) AND B < > VAL (B$) THEN IF X + Y < > Z + (10 * A) AND X + Y + 1 < > Z + (10*A) THEN PRINT "ERROR IN COLUMN":C: GOTO 1790
1650 IF X = VAL (X$) AND Y = VAL (Y$) AND Z = VAL (Z$) AND A < > VAL (A$) AND B = VAL (B$) THEN IF X + Y + B < > Z AND X + Y + B < > Z + 10 THEN PRINT "ERROR IN COLUMN":C: GOTO 1790
1660 IF X = VAL (X$) AND Y = VAL (Y$) AND Z = VAL (Z$) AND A < > VAL (A$) AND B < > VAL (B$) THEN IF X + Y < > Z AND X + Y + 1 < > Z AND X + Y < > Z + 10 AND X + Y + 1 < > Z + 10 THEN PRINT "ERROR IN COLUMN":C: GOTO 1790
1670 IF X = VAL (X$) AND Y = VAL (Y$) AND A = VAL (A$) AND B = VAL (B$) THEN PRINT Z$ "A=":X + Y + B - (10 * A)
1680 IF X = VAL (X$) AND Y = VAL (Y$) AND A = VAL (A$) AND B < > VAL (B$) THEN PRINT Z$ "A=":X + Y - (A * 10) "OR":X + Y + 1 - (A * 10)
1690 IF X = VAL (X$) AND Y = VAL (Y$) AND A < > VAL (A$) AND B = VAL (B$) THEN PRINT Z$ "A=":X + Y + B - 10: "OR":X + Y + B
1700 IF X = VAL (X$) AND Y = VAL (Y$) AND A < > VAL (A$) AND B < > VAL (B$) THEN PRINT Z$ "A=":X + Y: "OR":X + Y + 1: "OR":X + Y - 10: "OR":X + Y + 1 - 10
1710 IF X = VAL (X$) AND Z = VAL (Z$) AND A = VAL

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(A$) AND B = VAL (B$) THEN PRINT Y$: "A=":Z + (10 * A) - (X + B)
1720 IF X = VAL (X$) AND Z = VAL (Z$) AND A = VAL (A$) AND B < > VAL (B$) THEN PRINT Y$: "A=":Z + (10 * A) - X: "OR":Z + (10 * A) - (X + 1)
1730 IF X = VAL (X$) AND Z = VAL (Z$) AND A < > VAL (A$) AND B = VAL (B$) THEN PRINT Y$: "A=":Z - (X + B): "OR":Z + 10 - (X + B)
1740 IF X = VAL (X$) AND Z = VAL (Z$) AND A < > VAL (A$) AND B < > VAL (B$) THEN PRINT Y$: "A=":Z - X: "OR":Z - (X + 1): "OR":Z + 10 - X: "OR":Z + 10 - (X + 1)
1750 IF Y = VAL (Y$) AND Z = VAL (Z$) AND A = VAL (A$) AND B = VAL (B$) THEN PRINT X$: "A=":Z + (10 * A) - (Y + B)
1760 IF Y = VAL (Y$) AND Z = VAL (Z$) AND A = VAL (A$) AND B < > VAL (B$) THEN PRINT X$: "A=":Z + (10 * A) - Y: "OR":Z + (10 * A) - (Y + 1)
1770 IF Y = VAL (Y$) AND Z = VAL (Z$) AND A < > VAL (A$) AND B = VAL (B$) THEN PRINT X$: "A=":Z - (Y + B): "OR":Z + 10 - (Y + B)
1780 IF Y = VAL (Y$) AND Z = VAL (Z$) AND A < > VAL (A$) AND B < > VAL (B$) THEN PRINT X$: "A=":Z - Y: "OR":Z - (Y + 1): "OR":Z + 10 - Y: "OR":Z + 10 - (Y + 1)
1790 NEXT C: GOTO 780
1800 REM
1810 REM HELP
1820 REM
1830 POKE 34,7: HOME
1840 PRINT "HELP"
1850 PRINT : PRINT "CTRL-R*RESTARTS*CRYPTARITHMATIC*HELPER"
1860 PRINT "CTRL-S*RESTARTS*THE*CURRENT*PROBLEM"
1870 PRINT "CTRL-I*RE-APPLIES*THE*INITIAL*RULES"
1880 PRINT "CTRL-Q*QUITS*CRYPTARITHMATIC*HELPER"
1890 PRINT "/^OR^?^RETURNS*YOU*TO*THE*HELP*SCREEN"
1900 PRINT : PRINT "PRESS*ANY*KEY*TO*CONTINUE": PRINT : PRINT : GET JKS: HOME : POKE 34,22: HOME : RETURN

```

```

160 - $171B 1110 - $671A
170 - $B4C4 1120 - $2F39
180 - $EF38 1130 - $5B6F
190 - $7AD9 1140 - $A070
200 - $ACA2 1150 - $29CA
210 - $97A1 1160 - $3290
220 - $5D86 1170 - $B06A
230 - $D410 1180 - $8A0F
240 - $4D3D 1190 - $6C68
250 - $1EEA 1200 - $7286
260 - $B537 1210 - $3855
270 - $CBCC 1220 - $CCEF
280 - $749B 1230 - $C377
290 - $6F1F 1240 - $142D
300 - $AE78 1250 - $23EE
310 - $8049 1260 - $3757
320 - $DD6A 1270 - $3944
330 - $B214 1280 - $2689
340 - $5C8F 1290 - $0F61
350 - $9B79 1300 - $770F
360 - $5539 1310 - $028E
370 - $0D76 1320 - $2DAD
380 - $973E 1330 - $247C
390 - $25F4 1340 - $755E
400 - $76A4 1350 - $AE3D
410 - $6E94 1360 - $0B3D
420 - $40BD 1370 - $97C7
430 - $D050 1380 - $4A58
440 - $ABB0 1390 - $6AE5
450 - $CB56 1400 - $7B18
460 - $6356 1410 - $123E
470 - $5061 1420 - $971A
480 - $D15B 1430 - $FF58
490 - $AFB6 1440 - $DB9F
500 - $D2B4 1450 - $7258
510 - $0F09 1460 - $BC98
520 - $C2EE 1470 - $EEA7
530 - $B9E0 1480 - $5192
540 - $6F70 1490 - $7FCB
550 - $876E 1500 - $52C2
560 - $EA70 1510 - $52F5
570 - $6F2F 1520 - $F02D
580 - $ABC8 1530 - $D04A
590 - $D09B 1540 - $22EC
600 - $A6D2 1550 - $1322
610 - $BC4E 1560 - $9661
620 - $6F58 1570 - $FFAF
630 - $8A3E 1580 - $E361
640 - $2145 1590 - $0FE6
650 - $C6A5 1600 - $7499
660 - $E62D 1610 - $69D6
670 - $5D26 1620 - $C14E
680 - $7A4C 1630 - $9FC2
690 - $4783 1640 - $1A98
700 - $AE05 1650 - $214F
710 - $F35C 1660 - $3BEF
720 - $B93B 1670 - $F174
730 - $CCB0 1680 - $CA2E
740 - $35F4 1690 - $B055
750 - $4516 1700 - $6652
760 - $7638 1710 - $7668
770 - $10C4 1720 - $C42C
780 - $D11C 1730 - $7AFC

```

Checksums

```

10 - $BADD 960 - $2E86
20 - $9B13 970 - $4E0D
30 - $4D3B 980 - $DD4B
40 - $AD92 990 - $18E8
50 - $C899 1000 - $C6BC
60 - $FF65 1010 - $01E1
70 - $A3BF 1020 - $289B
80 - $A900 1030 - $176C
90 - $924D 1040 - $0F3A
100 - $CB63 1050 - $D8E9
110 - $4F3D 1060 - $05CB
120 - $E31C 1070 - $41D3
130 - $CECB 1080 - $77DE
140 - $15E7 1090 - $674F
150 - $8B26 1100 - $1254

```



790 - \$0950	1740 - \$1354
800 - \$6D07	1750 - \$A3F4
810 - \$C5B2	1760 - \$A9EF
820 - \$3919	1770 - \$E9A6
830 - \$6DE0	1780 - \$67AE
840 - \$4F26	1790 - \$9C3F
850 - \$AB20	1800 - \$BC58
860 - \$4D0F	1810 - \$2F0F
870 - \$00BA	1820 - \$8465
880 - \$2B9A	1830 - \$0B29
890 - \$AC82	1840 - \$DDE3
900 - \$304A	1850 - \$BC5A
910 - \$AB7A	1860 - \$3405
920 - \$7A29	1870 - \$C875
930 - \$4C8F	1880 - \$FD30
940 - \$A1C7	1890 - \$3E33
950 - \$77E9	1900 - \$69A0

Stanley Planton

Using EDD IV To Modify Tracks & Sectors

Requirements

- Apple II-ish computer
- Essential Data Duplicator* (EDD) 4.N or 4.N+
- DOS 3.3 disk
- 2 blank disks

Are you frustrated by having to write complex controllers for *Super IOB*, or wish that *COPYA* had some sector editing capabilities when you use it? Have you run into situations where you KNOW that there is a certain sequence of bytes on a disk, but you can't persuade your sector-editor to read the next track?

There are a few useful tricks you can perform with the newer versions of *EDD*, both the *EDD 4.N* and *EDD 4.N+*, that may solve your next difficult-to-normalize problem for you.

Most of us are familiar with the speed and efficiency of *EDD* as a disk-copying utility, but may be less comfortable with using *EDD* to scan tracks for either individual bytes or complex sequences of bytes, and with using *EDD* to change them automatically to other values.

A major reason for this lack of familiarity with some of *EDD*'s more powerful routines is due to the relative obscurity of the manual that comes with the program. Experienced, as well as novice users can be left somewhat puzzled by the author's lack of clarity and detail in explaining just what can be done with *EDD*, and **how to do it**.

This article is an attempt to explain one of the more exotic functions of this popular

program, and to give some examples of how *EDD*'s power can be applied to problems.

If you haven't already rushed out to your favorite software vendor to buy the '4.N' version of *EDD*, then you might want to do so after reading these tips!

Assuming that you have the program in question, boot it up, and look at the main menu. You will see that there are nine major options; select the second one: "CHANGE PARAMETERS" and press **RETURN**.

Put a normal DOS 3.3 disk in your "ORIGINAL" drive (normally Drive #2 for *EDD*), and a blank disk in the "DUPLICATE" drive. The "original" disk must be write-protected.

From the "CHANGE PARAMETERS" menu, select the third option, "REPROGRAM PREWRITE ROUTINE", and press **RETURN**. The screen should show a display that looks something like this:

```
CHANGE PREWRITE BYTE 00 = 01
```

Note that the first number is the NUMBER of the INSTRUCTION, and the second number is the actual instruction or value. *EDD* will perform sequences of instructions that you type in; the trick is to tell *EDD* what to do when. If you are looking at the printed *EDD* manual, most of the following is somewhat explained between pages 39 and 64.

The instructions you will type in will tell *EDD* to read each track into RAM memory, but ALSO to check the track for sequences of bytes and to CHANGE these bytes to something else when it writes the track out to the "duplicate" disk.

There is a lot of power available to the user: you can change almost anything into anything else, and perform sector editing automatically without using a sector editor, once you figure out the instructions.

Let's start by changing all the address headers on the disk we're copying. The standard values are D5 AA 96 for DOS 3.3, so let's tell *EDD* to change them to some other value, say D4 AA 96 (sound familiar?). The start of *EDD*'s PREWRITE instructions is byte #000, so let's enter an appropriate value into this location, and follow it with more instructions to tell *EDD* to change all the D5 AA 96 headers on the disk to D4 AA 96 bytes. Some of the relevant instructions are as follows:

- 10 Return, do next track
- 20 Start on next instruction byte
- 21 Loop back until done (go to next sector, etc.)
- 31 Search for...
- 36 Replace with...

The first instruction should be a #20 (start), followed by a #31 (look for), the values D5 AA 96 (three bytes), a #36 (replace with), the three bytes D4 AA 96, a #21 (look for the next D5 AA 96), and a #10 (go back, take a new track and start over).

There is a trick to entering values into these

EDD routines: you must use the spacebar between MOST entries; only use the **RETURN** following the value entered into the #00 instruction and the final value. I know that this sounds unclear, but try it.

Remember, in *COMPUTIST* the required **SPACE** is indicated by ^ and **RETURN** must be pressed after the command line. You should type in the following:

```
00 = 20
20^31^D5^AA^96^36^D4^AA^96^21^10
```

OK? Now go back to the main menu of *EDD* and copy the DOS 3.3 disk to the blank. Try to boot the copy: it shouldn't boot if the above was correctly entered. If you scan a few tracks on the disk, you should find that every address header is now D4 AA 96. Right? Now, can you change it back?

To get rid of the D4 AA 96 pattern, just switch the D5 and D4 values in the above instructions, tell *EDD* to look for all D4 AA 96 headers and change them to D5 AA 96.

The real beauty of *EDD* for this purpose is that it doesn't care how a track is formatted; it reads byte-to-byte, so you can normalize very weird and wondrous tracks and sectors without a great amount of difficulty. You can even skip around on the disk, if desired, as only tracks that are copied with the changed parameters are altered. Oh, the instructions to get rid of the D4s should look something like this:

```
20^31^D4^AA^96^36^D5^AA^96^21^10
```

Now copy the copy with these instructions entered into the "PREWRITE" routines. You should have a normal DOS 3.3 disk again!

If you're like me, this experiment should give you a few ideas about how to approach the problem of normalizing bizarre tracks.

Sometimes we want to copy a disk and to automatically change unwanted instructions whenever or wherever they are located. Let's say we want to get rid of calls to reboot the disk; frequently written to a track as:

```
4C 00 C6 (jump to $C600, reboot).
```

We can use the same kind of format as in our previous experiment, and tell *EDD* to change each and every occurrence of these instructions to something else, such as: EA EA EA (do nothing, three times).

The instructions for the PREWRITE routine in this case would read

```
20^31^4C^00^C6^36^EA^EA^EA^21^10
```

You can scan for even longer sequences of bytes, if you desire; I've been using three-byte sequences for clarity.

If you want to write simple copy-protection schemes for disks, you can combine some of the techniques that appear in *COMPUTIST* each month with *EDD*'s power, and come up with some real challenges. An example of this might be to change address headers on every other track of a disk.



There are a couple of ways to approach the problem, one involving telling the disk's DOS what to look for and how to handle it, the other being to tell the DOS to ignore some bytes. I'll choose the latter, and leave the reprogramming of DOS itself to someone with more time.

1 Boot up a "clean" DOS, and enter the monitor.

CALL-151

2 Tell the DOS in memory to ignore the first byte of the address header.

B954: 29 00

3 Re-enter BASIC.

E003G

4 Init a disk.

INIT HELLO

Now you have a disk formatted for DOS 3.3, but the DOS of which doesn't give a hoot about the first byte of the address header.

5 Copy your files to this disk. Copy this disk to a blank disk as follows:

6 Copy the first three tracks (\$00-\$02) with NORMAL parameter settings. You don't want to totally destroy DOS, do you?

7 Use the power of EDD to change headers on the rest of the disk. It's fun to change every other track, every third track, etc, to something other than a value of D5 AA 96 for the address header; you can have D5 AA 96 swapping around with D4 AA 96, D6 AA 96, BB AA 96, or anything else you want.

When you've had enough fun, boot the disk you've produced. If you confined your creativity to tracks \$03-\$22, and didn't make TOO many mistakes entering parameters into EDD, you should have a disk that will still boot, but that has a degree of copy-protection. If you REALLY want to be creative, totally destroy unused tracks and vary the drive speed from track to track. OK? Now, undo it!

If you've gone through all of the above, you'll be ready to use EDD to solve the next 'impossible' disk problem you encounter. Go get 'em!

Jack Moravetz

Softkey for...

Little Computer People
Activision

It seems that Activision has used a similar protection scheme on much of their software. Using the sector-editor in *Copy II Plus v7.4*,

I scan for the bytes A9 56 85. Usually in the same sector about 64 bytes away will be the bytes 25 FC. By changing the bytes from and including the A9 56 85 to the 25 FC to EAs and changing the 25 FC to A9 FF will usually disable the nibble-count routine.

For Activision's *Little Computer People*, I found the bytes A9 56 85 on track \$00, sector \$0A beginning at byte \$73. The 25 FC was found on track \$00, sector \$0A beginning at byte \$B3.

Tony H. Ikeda

*Iigs Softkey for...

Thexder

Sierra On-Line

Here is a quick softkey for *Thexder* (a Iigs game with great sound and graphics!)

Block	Byte(s)	From	To
562	\$30	B0	80
	\$3B	F0	80
	\$53	90	80
	\$75	90	80

Enjoy, and keep up the good work!

Dick Lavalley

*Iigs Softkey for...

GraphicWriter Version 1.1RA

DataPak Software

Requirements

- 3 1/2" disk sector-editor
- ProDOS sector-editor for 3 1/2" disks such as *BYTEZAP.PRO* mod (COMPUTIST #48) or *SAND.PRODOS*.
- Disk-to-disk copier for 3 1/2" disks (*Copy II Plus v7.4*, *Diversi-copy v3.2*, etc.).
- Blank 3 1/2" disk.

1 Copy *GraphicWriter* disk-to-disk.

2 Place the original in a safe place.

3 With a 3 1/2" ProDOS block editor make the following edits:

Block	Byte(s)	From	To
\$45C	\$12B	D0 0A	EA EA
\$30C	\$15F	D0 05	EA EA

Requirements

- 5 1/4" disk sector-editor
- Sector editor for 5 1/4" disk.
- Copier for 3 1/2" and 5 1/4" disks.
- Blank 3 1/2" disk.
- ProDOS-formatted 5 1/4" disk.

1 Copy *GraphicWriter* disk to disk.

2 Place the original in a safe place.

3 Copy *PROGRAMS/GRAPHIC WRITER* from the duplicate 3 1/2" disk to the 5 1/4"-formatted disk.

4 Search the 5 1/4" disk for the string D0 0A A9 AA D5 8F 6A

5 Change D0 0A to EA EA.

6 Copy the modified *PROGRAMS/GRAPHICWRITER* file from the 5 1/4" disk to the 3 1/2" duplicate disk.

7 Copy *PROGRAMS/HD.INSTALL* from the duplicate 3 1/2" disk to the 5 1/4" formatted disk.

8 Search the 5 1/4" disk for the string D0 05 A9 00 01 80 03

9 Change D0 05 to EA EA.

10 Copy the modified *PROGRAMS/HD.INSTALL* file from the 5 1/4" disk to the 3 1/2" duplicate disk.

El Chucko

*Iigs Softkey for...

Print Shop Iigs

Broderbund

Not too big of a change but the protection is found in different places on various copies of the new *Print Shop*. On one copy I found it on block \$2A bytes \$7F-81 while on another it was on block \$2F bytes \$7F-81. Using a block editor, search for: F0 AB 20 61 42 20 4F 67. Change 20 4F 67 to EA EA EA.

I don't even have a Iigs but if I can contribute to eliminating copy-protection, I'm more than happy to do it.

Ⓞ I have one that has been bothering me for a couple of years that maybe someone can help with. *Crossword Magic 4.0* can be easily copied by different methods. The backup will work for everything but printing the crossword puzzle. I bought the program for classroom use and guard it carefully since I am unable to back it up. It has several track \$00's and screwy headers. I have succeeded in normalising them but of course it won't run. Who can help me?



Paul A. Johnson

Questions, questions, questions...

① #1: Is there any way to get a copy of the articles from COMPUTIST #11 about *Ultima II & III*? I am gathering a disk full of utilities for the *Ultima* series, the *Tales of the Unknown (Bard's Tale)* series, and the *Wizardry* series.

Also, does anybody have a program that will map the dungeons for *Wizardry*? My original was lost during a move before I started getting COMPUTIST, so I didn't have a backup and I can't write a dungeon mapper without the game.

② #2: Does anybody have any information about how the game is saved on *Elite*? I would like to be able to write a character editor for this game, but I have no idea how the data is stored in the 10-sector binary file. I've tried changing one thing and saving the game, but most of the file changes everytime I look at it. I would really appreciate some help.

③ #3: In COMPUTIST #47, Dr. Dracks stated that RDOS disks from SSI could be copied using an ARD. I tried doing this and I was able to list the AppleSoft program in memory, but I couldn't figure out how to transfer the files to another disk. I have a *Battle for Normandy* disk that is on its last legs and I would like to be able to copy it before it dies for good.

A.P.T. for...

Bard's Tale

Dungeon Mapper Revisited

■ Requirements

- The Bard's Tale* by Electronic Arts
- Hi-res screen dump utility

I enjoyed George Bigelow's article in COMPUTIST #47. I played the game without the aid of computer-generated maps, so I know what it is like to have to fight to the surface after a teleport, and not know if you're heading in the right direction. His program is good, but I could not easily understand the map on the screen.

I solved this by digging up a dungeon mapper that I wrote for *Standing Stones*, also by Electronic Arts.

I had to modify the program to suit the larger 22-by-22 dungeon levels, and also change

the shape table used. The shape table was made with *Apple Mechanic* by Beagle Brothers, so it actually has twelve shapes instead of four.

The first five shapes in the table are basically the same as the shapes used by this program for *The Bard's Tale*, but they are larger, which gives a better looking 16-by-16 map (for *Standing Stones*). I had to trim these shapes down to get the larger dungeon level to fit on the hi-res screen.

The first shape used by this program (shape #6 in the table) is a wall. It is a straight line. The second shape used is a door. It is a straight line with two hash marks. The third shape is a secret door, and it is a straight line with one hash mark. The last shape used is a dot, and it represents any effects (stairs, messages, etc.) on the map.

Enter the BASIC portion of this program and save it as *BARD MAPPER*. Then enter the hexdump and save it to the same disk as *SSSS.OBJ0*.

The program has several options. "Draw", "Print", and "Quit" are easy to understand, but "Menu" and "All Print" deserve some explanation.

Hitting **[M]** will toggle the screen from full-screen to split-screen graphics. This is helpful because the menu covers the bottom third of the map.

The **[A]** option will send ALL of the levels to the printer, one at a time. I wouldn't try this option unless you have something else to do for about an hour. (Yes, it is slow, but the entire map gets printed.)

This program will most likely have to be modified so you can get the best use of it.

One place to notice is in line 20. If you don't have two disk drives, then change DRV to 1. Then, after running the program and getting the command menu, replace the disk containing the program and object file with the dungeon disk.

Another thing that may need changing is the hi-res dumping code in line 260. I have a *Pkaso-U* card hooked up to an Epson FX-80 printer. The code I have in the program dumps the screen magnified 2 dots horizontal and three dots vertical for every dot on the screen. This slows the printing process, but I get bigger maps with more room for "special" descriptions. This string can be changed to whatever it takes to get your system to dump the screen.

One suggestion that I have is to use this program to get a good looking map, and then use George's program to get an effects map to learn what the dots mean (That's what I do.)

Also, if you want some help, but not too much, this program will give you the maps and the locations of special things, but you will have to go out and determine what the specials are.

Good Luck and may your Bard never get laryngitis.

BARD MAPPER

```

10 PRINT CHR$(4) "BLOOD"SSSS.OBJ0.D1.A25000"
   : POKE 232,209: POKE 233,97
20 SCALE=1:LO=16384:TF=256:M=0:DRV=2:AS
   = "MPDA" : DIM M$(16)
30 FOR A=0 TO 16: READ M$(A) : NEXT : REM READ
   LEVEL NAMES
40 REM POKE 768,32: POKE 769,227: POKE 770,3:
   POKE 771,76: POKE 772,217: POKE 773,3:
   POKE 47092,1: REM READ SECTOR ROUTINE
50 DATA NONE,CELLARS(1),SEWERS(2),SEWERS(3
   ),SEWERS(4),CATACOMBS(5),CATACOMBS(6
   ),CATACOMBS(7),CASTLE(8),CASTLE(9),C-
   ASTLE(10),TOWER(11),TOWER(12),TOWER(
   13),TOWER(14),TOWER(15),TOWER(16)
60 REM MENU
70 HOME
80 VTAB 21: PRINT "D)RAW"LEVEL" : SPC(13):
   "R)ETURN"TO"QUIT"
90 VTAB 22: PRINT "P)RINT"LEVEL"ON"SCREEN" :
   PRINT "A)LL"LEVELS"TO"PRINTER" : PRINT
   "M)ENU"TOGGLE" ;; VTAB 23: HTAB 25:
   INVERSE : PRINT M$(LVL): NORMAL
100 POKE 49168,0
110 X=PEEK(49152): IF X < 128 THEN 110
120 POKE 49168,0
130 IF X=141 THEN POKE 43624,1: POKE 47082,1:
   HOME : VTAB 21: END
140 FOR A=1 TO 4
150 IF CHR$(X-128)=MID$(AS,A,1) THEN 180
160 NEXT
170 GOTO 60
180 ON A GOSUB 200,230,300,420
190 GOTO 60
200 REM MENU TOGGLE
210 POKE 49234+M,0:M=(M=0)
220 RETURN
230 REM SEND HI-RES SCREEN TO PRINTER
240 PRINT CHR$(13)+CHR$(4)"PR#1"
250 PRINT : PRINT : PRINT TAB(28);M$(LVL)
260 PRINT CHR$(9)"2.3H" : REM DUMP ROUTINE FOR
   PKASO-U CARD.
270 PRINT CHR$(12): REM FORM FEED
280 PRINT CHR$(4)"PR#0"
290 RETURN
300 REM DRAW A LEVEL
310 HOME : VTAB 21: INPUT "LEVEL"TO"DRAW"
   (1-16):" " : LVL$
320 IF LVL$="" THEN RETURN
330 LVL=VAL(LVL$)
340 IF LVL < 1 OR LVL > 16 THEN 310
350 GOSUB 640
360 TRK=15-(INT(LVL/2+.5)):SEC=15-((
   INT(LVL/2)*2=LVL)*8)
370 GOSUB 550:SEC=SEC-1:LO=LO+256:GOSUB
   550:LO=LO-256:REM READ INFO
380 GOSUB 490:REM DRAW LEVEL
390 SEC=SEC-1:GOSUB 550:SEC=SEC-1:LO=LO
   +256:GOSUB 550:LO=LO-256:REM EFFECTS
400 GOSUB 590:REM DRAW EFFECTS LOCATIONS
410 RETURN

```



```

420 REM SEND ALL LEVELS TO PRINTER
430 POKE 24999, 1
440 LVL = PEEK (24999) : GOSUB 640 : GOSUB 360 : REM
    READ INFO & DRAW LEVEL
450 GOSUB 230 : REM PRINT LEVEL
460 IF LVL = 15 THEN RETURN
470 POKE 24999, LVL + 1
480 Q = FRE (0) : GOTO 440
490 REM DETERMINE ROOM CONFIGURATION
500 FOR SQ = 0 TO 483 : X = (SQ - (INT (SQ / 22) *
    22)) * 7 + 10 : Y = INT (SQ / 22) * 7 + 10
510 POKE 24576, PEEK (SQ + LO) : REM PUT INFO INTO
    MEMORY FOR MACHINE CODE
520 CALL 25000 : REM DETERMINE WHERE WALLS GO
530 FOR S = 1 TO 4 : ROT = 32 - ((S - 1) * 32) + 80
    * (S > 2) : IF PEEK (24576 + S) THEN DRAW
    PEEK (24576 + S) + 5 AT X, 190 - Y
540 NEXT S : NEXT SQ : RETURN
550 POKE 768, 32 : POKE 769, 227 : POKE 770, 3 : POKE
    771, 76 : POKE 772, 217 : POKE 773, 3 : POKE
    47092, 1 : REM READ SECTOR ROUTINE
560 POKE 43624, DRV : POKE 47082, DRV : POKE
    47083, 0 : POKE 47084, TRK : POKE 47085, SEC :
    POKE 47088, LO - INT (LO / TF) * TF : POKE
    47089, INT (LO / TF) : POKE 47090, 0 : POKE
    47091, 0
570 CALL 768
580 RETURN
590 REM EFFECTS LOCATIONS
600 FOR SQ = 0 TO 483 : X = INT (SQ - (INT (SQ / 22)
    * 22)) * 7 + 10 : Y = INT (SQ / 22) * 7 + 10
610 IF PEEK (SQ + LO) THEN DRAW 9 AT X, 190 - Y
620 NEXT SQ : RETURN
630 REM PLOT GRID AND BORDER
640 HGR : HCOLOR = 3
650 FOR X = 6 TO 160 STEP 7 : FOR Y = 29 TO 183 STEP
    7 : HPLLOT X, Y TO X + 1, Y TO X + 1, Y + 1 TO X, Y
    + 1 : NEXT Y : NEXT X : REM PLOT GRID
660 HPLLOT 6, 29 TO 6, 184 TO 161, 184 TO 161, 29 TO
    6, 29 : REM BORDER
670 RETURN

```

Checksums

10	- \$5DC0	350	- \$506C
20	- \$217E	360	- \$2302
30	- \$C229	370	- \$2212
40	- \$8F05	380	- \$9E8C
50	- \$A4FE	390	- \$AC90
60	- \$6477	400	- \$F3A6
70	- \$04FE	410	- \$7D53
80	- \$059C	420	- \$D7ED
90	- \$2A75	430	- \$1E0A
100	- \$ACE3	440	- \$DC5C
110	- \$71CA	450	- \$4835
120	- \$6366	460	- \$70ED
130	- \$5538	470	- \$A6FC
140	- \$8FE4	480	- \$F075
150	- \$E92A	490	- \$39A3
160	- \$C848	500	- \$3503
170	- \$9854	510	- \$21D8
180	- \$8C9C	520	- \$9EE8
190	- \$0062	530	- \$04F7
200	- \$78E9	540	- \$C973
210	- \$307A	550	- \$CFE8

220	- \$D38A	560	- \$7ED2
230	- \$10ED	570	- \$F966
240	- \$26DB	580	- \$9221
250	- \$C529	590	- \$BAF8
260	- \$E65B	600	- \$F143
270	- \$8CDD	610	- \$95DF
280	- \$7CC5	620	- \$14DF
290	- \$0A0A	630	- \$6CF6
300	- \$72A0	640	- \$B424
310	- \$5ED5	650	- \$F344
320	- \$D453	660	- \$8057
330	- \$EB46	670	- \$C707
340	- \$BAE1		

SSSS.OBJ

61A8:	A9 00 8D 01 60 8D 02 60	\$0DDF
61B0:	8D 03 60 8D 04 60 A2 00	\$3C59
61B8:	E8 6E 00 60 90 03 FE 00	\$CE47
61C0:	60 6E 00 60 90 06 FE 00	\$8D31
61C8:	60 FE 00 60 E0 04 D0 E8	\$CD70
61D0:	60 0C 00 20 00 2D 00 39	\$C116
61D8:	00 43 00 47 00 63 00 6A	\$9470
61E0:	00 72 00 7A 00 7C 00 7E	\$0079
61E8:	00 80 00 82 00 05 00 05	\$32B6
61F0:	00 92 D2 DB 2B 2D 25 B4	\$84A2
61F8:	29 24 56 2D 2D 00 92 D2	\$2BBF
6200:	DB 2B 2D 2D 24 8E 2D 2D	\$79D6
6208:	05 00 92 D2 DB 2B 2D 2D	\$2D1D
6210:	2D 2D 2D 00 BC 6E 24 00	\$EA4E
6218:	17 17 17 17 17 4D 49 49	\$8FD6
6220:	E1 1C 1C 1C 1C 1C 1C 1C	\$71D7
6228:	1C 1C 4D 49 49 F1 1E 1E	\$E242
6230:	1E 1E 06 00 92 DB 2D 2D	\$FF93
6238:	2D 05 00 92 DB 2D 74 25	\$9988
6240:	0E 2D 00 92 DB 2D 25 0E	\$FF22
6248:	2D 05 00 05 00 05 00 05	\$A9FB
6250:	00 05 00 05 00	\$FFD5

B. Dudley Brett

Softkey for...

Bard's Tale II

Electronic Arts

As revealed extensively before (last reference: *Artic Fox* in *COMPUTIST* #47, page 29), Electronic Arts continues to rely upon a track \$06 nibble-count. The entry points to disk checks still use similar addresses, though these are located at slightly different places on the boot side of *Bard's Tale II*. The easy way to produce a backup (i.e. *COPYA*-able) disk is:

1 Format (INIT) the front side of a blank disk with DOS 3.3.

2 Use a fastcopy to copy all four sides onto two disks, placing the boot disk onto your formatted side. Ignore the errors on track 6.

3 Using any sector editor, make these sector edits upon the copied boot side and then

write-protect all 4 sides (as originals).

Trk	Sct	Byte(s)	From	To
\$01	\$0C	\$00-02	4C 69 05	18 60 42
		\$6F-71	4C 69 05	18 60 42
01	0E	\$52-54	20 03 A0	18 60 4B
01	0F	\$00-02	4C 69 A0	18 60 DD
		\$6F-71	4C 69 A0	18 60 DD

Softkey for...

Learning Well series

Mindscape

Mindscape, in its educational programs (*Learning Well* series) relies upon altered address and/or data trailers. Sometimes the first byte of the address header may also be altered.

Most commonly, a very simple, changing data trailer on several disks can be made *COPYA*able by turning off the trailer check in DOS 3.3 and copying with *COPYA*. The disks which are backed up this way are:

Body Awareness

Fun with Direction

Letters and Words

Knowing Numbers

Shapes and Patterns

Make a *COPYA* copy:

LOAD COPYA
POKE 47426,24
RUN

When done, make these sector-edits.

Trk	Sct	Byte(s)	From	To
\$00	\$03	\$42	38	18

Growing Up Small

One Mindscape program, *Growing up Small*, has altered address trailers, with D5 AA 96 on even tracks and D4 AA 96 on odd tracks. On some sectors the address trailer is also modified. Change DOS to ignore the first prologue byte and the epilogue bytes then run *COPYA*.

CALL-151
B954:29 00
B989:18 60
RUN COPYA



Softkey for...

Kindercomp

Spinnaker

Though a controller and Super IOB can be used (ref: COMPUTIST #45, page 23), I prefer the *DEMUFFIN PLUS* approach. This entails capturing the *Kindercomp* RWTS using *XFER.BOOT*. Here is the procedure:

1 Format a blank disk (use a fast DOS).

INIT HELLO

2

BLOAD XFER.BOOT

3 Insert original *Kindercomp*.

PR#3

4 Run *Kindercomp* in extended memory.

CALL 768

5 And when the prompt appears:

RESET

6 Recenter the monitor.

CALL-151

BLOAD RESTORE

set **Y** to point to *RESTORE*

3F8:4C 00 03

move RWTS into lower memory

6800<B800.BFFF Y

BLOAD DEMUFFIN PLUS,AS4000

Move *DEMUFFIN* into place

803<4000.6000M

Move *Kindercomp* RWTS

B800<6800.6FFF

Run *DEMUFFIN*

803G

7 When *DEMUFFIN* asks for a filename use the wildcard (=) with no prompt.

Softkey for...

Bard's Tale I

Electronic Arts (EA)

Quick sector edits have been previously suggested in *COMPUTIST*. My copy had several calls to the EA nibble count and rather than take a chance on having one of these causing a disk reboot, I decided to turn them all off! Here they are:

1 Copy all 3 sides with a copier that ignores any errors on track \$06.

2 Make the following edits to the boot disk only:

Trk	Sct	Byte(s)	From	To
\$01	\$0B	\$47-49	20 F8 A0	18 60 40
\$01	\$0C	\$00-02	4C 69 05	18 60 42
		\$6F-71	4C 69 05	18 60 42
\$01	\$0E	\$4C-4E	20 03 A0	18 60 4B
		\$47-49	20 F8 A0	18 60 40
\$01	\$0F	\$00-02	4C 69 A0	18 60 DD
		\$6F-71	4C 69 A0	18 60 DD

† Softkey for...

Alphabet Zoo

Spinnaker

I tried to use the Super IOB controller in *COMPUTIST* #24, page 8 and *COMPUTIST* #29, page 9 but my original just would not copy. After using *CIA*, it was apparent that on several sectors the data trailers seem to have some further alteration to that indicated in *COMPUTIST*.

The answer to this is simply to turn off the trailer check in DOS with **POKE 47426, 24**

Now perform the softkey as shown in *COMPUTIST* #24. Don't forget the correction in *COMPUTIST* #29.

Scott M. Simon

Softkey for...

Super Boulder Dash

Electronic Arts

■ Requirements

- 64k Apple II and up
- Locksmith Fast Copy
- Blank Disk

The protection is similar to the protection used on most Electronic Art's games. Copy the disk with *Locksmith* fast copy or any other copier that ignores errors. Edit the copy as follows:

Trk	Sct	Byte(s)	From	To
\$01	\$0A	\$52-54	6C 54 00	18 60 48
\$01	\$0F	\$00-02	4C 69 A0	18 60 DD

Well that's it. Have fun!

Softkey for...

Master Diagnostics IIe

Master Diagnostics IIe (MDIIe) is a useful program that can test your Apple for proper

performance in the ROM, RAM, 80-column card, interface cards, disk drives, mouse, paddles, and more. It is also a disk-intensive program that loads code in segments while it is executing. With this fact in mind, one can understand the deadliness of the program's main drawback: It is copy-protected. I will detail the steps I went through to deprotect MDIIe. For those who want to crack the disk immediately, go to the "cookbook" instructions.

The most useful cracking tool that any hacker can possess is a defined series of steps used to analyze a particular disk. The outcome of this analysis should determine if a disk uses a popular operating system and at least a hint of what method of protection is used.

Using my personal method of analysis, I discovered that MDIIe uses an operating system similar to DOS 3.3, is encrypted on disk, and has an altered data mark format. The fact that a "I" prompt appeared during booting told me that the DOS was fairly normal.

A nibble editor showed me the altered address and data mark format. The same nibble editor (*CIA* files) made me suspect that the data was encrypted since the first few sectors on track \$00 would decode, but the rest of the sectors would not.

There are several ways of attacking these problems, but the best way is the method which knocks out all of the protection at once.

How to do this? Simply find a program that can use the protected disk's Read-Write-Track-Sector (RWTS) to read the protected disk's sectors and that can use the normal DOS 3.3 RWTS to write the sectors back in standard format.

For those of you who haven't guessed, this program is Super IOB V1.5. However, to use this, we must have a copy of the protected RWTS saved to the Super IOB disk and we must write a short controller for Super IOB to use. Let us begin.

Boot your DOS 3.3 disk. It is assumed that you will hit **RETURN** after the commands listed here. Once DOS is in memory, type **NEW**. Then, **POKE 40514,52**. This patch to DOS will allow the greeting program to be BRUN instead of RUN. Now, insert your blank disk and type **INIT STARTUP**.

After the initialization process is finished, delete the file *STARTUP* from the newly formatted disk. Insert your MDIIe disk and type **PR#6** to boot it. After it has booted, reset into the monitor and move the RWTS to address \$1900 by typing **1900<B800.BFFF**

Insert your DOS 3.3 disk and type **C600G**. After it has booted, reinsert your disk with Super IOB on it and type **BSAVE RWTS.MD,AS1900,LS7FF**.

Having captured the RWTS, we must now write a controller for Super IOB. Type **NEW** then enter the following controller and save it to disk.



Controller

```

1000 REM SWAP CONTROLLER FOR MDIIE
1010 TK = 3 : LT = 35 : ST = 15 : LS = 15 : CD = WR
      : FAST = 1
1020 GOSUB 360 : GOSUB 490 : GOSUB 610
1030 GOSUB 360 : GOSUB 490 : GOSUB 610 : IF PEEK
      (TRK) = LT THEN 1050
1040 TK = PEEK (TRK) : ST = PEEK (SCT) : GOTO 1020
1050 HOME : PRINT "COPYDONE" : END
10010 PRINT CHR$(4) "BLOAD RWTS.MD,AS1900"

```

Controller Checksums

1000	- \$356B	1040	- \$0D4F
1010	- \$2445	1050	- \$8E0B
1020	- \$C908	10010	- \$F060
1030	- \$FB9C		

This is basically the swap controller featured in COMPUTIST #22 with line 1010 changed to start copying at track \$03, sector \$00, instead of at track \$00, sector \$00. This is changed because we do not want to copy the protected DOS.

Load Super IOB V1.5 then merge the MDIIE controller. Now, Super IOB will use the protected RWTS to read the original disk and the normal RWTS to write to the copy disk. Type RUN and follow the instructions. After the copy is done, the copy should boot normally and it will be COPYA-able. If you want to examine the files, it will perform all DOS commands normally.

1 Boot DOS 3.3 and clear any Applesoft program.

NEW

2 Make hello program binary.

POKE 40514,52

3 Insert blank disk and initialize.

INIT STARTUP

4 Delete the hello program.

DELETE STARTUP

5 Boot the MDIIE disk

6 Enter the monitor and move the RWTS.

CALL -151

1900<B800.BFFF

7 Boot your disk with Super IOB on it

8 Save the MDIIE RWTS.

BSAVE RWTS.MD,AS1900,LS7FF

9 Load Super IOB.

LOAD SUPER IOB V1.5

10 Type the controller and run Super IOB.

Ralph Augenfeld

† softkey addendum for...

Catalyst 3.0

Quark

I have *Catalyst* in 3.5" format, and could not de-protect it with the softkey in COMPUTIST #43. The one in COMPUTIST #44, by Kevin Sartorelli, however, worked fine. The only trouble is that, in my version, the patch to *CATALYST.SYSTEM* to jump to the monitor (step 4: 2175:4C 59 FF) should be changed to 219E:4C 59 FF. The rest of the softkey works fine. Many thanks to Mr. Sartorelli.

† more Softkeys for...

Stickybear Series

Weekly Reader Software

On the *Stickybear* front, I have combined several of your softkeys into a method that seems to work on all my *Stickybear* disks. I have de-protected:

ABC's

Numbers

Drawing

Printer

Townbuilder

Printer Library I & II

Only one that I have seems to have further protection, and that is *Stickybear Math*.

First, follow Marc Lirrette's softkey in COMPUTIST #26, copy your original, and locate 01 60 01 00 with a disk search utility. Find out the protected track and sector number (usually \$01, \$0F), and where it is loaded to. Make the sector edit he recommends at 60 A2 00 A2 00, and then jump to Randy Ramirez' softkey in COMPUTIST #17 (also in Book of Softkeys #3) and execute both the move to \$6000 from where the protected sector is loaded to, and the short write routine, substituting the appropriate track and sector at B7EB:00 TT SS.

That's it!

RAMfactor Mod for the Laser 128

As of late I have heard a lot of talk about ROM disks and battery RAM. With the release of the *Memory Saver* card by Checkmate for the IIGs, the IIGs's own battery RAM, and the *Ramcharger* for the *Ramfactor* card (improved *Slinky* clone) by Applied Engineering, one hears a lot about "Appleworks in 15 seconds from power-up!"

As a 'lowly' Laser 128 owner with a one-megabyte *Ramfactor* card in a Central Point Software expansion box, I have taken "Appleworks in 15 seconds from power-up" for granted for some time now.

First, let me say that I didn't spring for a *Ramcharger* at \$179. **Instead, I use a single pole, single throw (SPST) toggle switch and two pieces of wire.**

Here's how I do it

The Laser 128 has an expansion slot on its side for one Apple compatible card, or a Laser expansion box, which gives two slots. This box has its own 5 volt supply. There is an outboard plug-in 12 volt unit that gets dropped and regulated to 5 volts by a single IC on a heat sink.

I removed the IC and feed the box with 5 volts directly. This ensures cool operation, further enhanced by a small fan sitting on top of the expansion box.

These steps are not really necessary, but since I leave my expansion box on all the time, it is recommended.

In any case, the extra power supply to my RAM board got me thinking, why couldn't I keep my data 'alive' if my computer is off and my expansion box is 'hot.'

So, I tried shutting my computer off, while keeping the power to my *Ramfactor* card. Of course, the data was trashed. It seems that the data gets trashed at power-up!

As an electrical engineer I like simple, elegant solutions. Hence, I discovered that grounding one of the pins that goes to the mysterious *Ramcharger* write-protects the card and "15 seconds to Appleworks" suddenly became a reality!

The details are as follows. First, a caveat. Obviously, monkeying with power supplies and RAM cards is not something for the klutz-oriented among us. Warranties go down the drain as can RAM chips, ROM chips, or all chips, as in fried (not french-). At this time, I can only recommend this procedure for Laser 128 owners with a *Ramfactor* card and an expansion box. After I describe the step-by-step, I will give hints to "real" Apple owners who want to experiment with their systems.



With the warnings in mind, remove ALL power from the computer and expansion box.

Hold the *Ramfactor* board with the chips towards you, and you'll see a 4-pin plug mounted on the left far side of the board. It has a pair of jumpers.

Remove the left hand jumper (nearer to the edge of the board) and replace with a miniature Japanese style 2-pin plug with two wires attached (I salvaged one from an ancient broken VCR). This is better than soldering, since it voids no warranties in an obvious way.

Mount a single-pole, single-throw toggle switch on the back of the expansion box, and connect to the two wires. One of these wires is ground. When the switch is open, the card's data is protected.

Replace card and carefully connect the power.

Just before turning the computer off, open the switch. Leave the power on in the expansion box, i.e., the red LED should stay on. When you turn the computer back on, leave the switch open until the disk drives come on, and then close the switch and boot or access the *Ramfactor* card normally. That's all!

As stated earlier, this is only for a Laser 128, a *Ramfactor* card, and an expansion box. However, if an enterprising reader with an Apple II who doesn't mind voiding guarantees wants to fool around, I would direct them to the other two pins as a place to 'inject' power, as it were, with perhaps a rectifier diode across it.

If the 'write-protect' bus is used as described before, it's possible to make it work, also. I'd like to hear from brave experimenters.

Good luck, and remember to try and keep your board cool: external 5 volt supplies and/or a small fan will help. I hope there are other serious Laser 128 users/hackers who would like more modifications and tips; maybe even a column?

P.S. If you want 'battery-backed' operation, you can simply place a small inexpensive gel-cell type lead-acid battery in series with a current limiting resistor across your external supply. Use an ammeter to set your 'trickle charge' to a safe 20 ma. or so, and you're protected against power company outages or blown fuses, etc. Now you have "Appleworks for 20 years..."

Rick Fabbre

Softkey for...

Word Maze

Learning Well

Well another program fell to the SIOB 1.5

axe. *Word Maze* is an interesting program for creating word mazes - the puzzles with words hidden in a square grid of letters. None of my bit copiers would touch this program. The presence of an applesoft prompt during boot led me to believe the swap controller or CopyB would make a successful backup, however - no luck.

A close examination of the disk with *Diskview* revealed the odd numbered tracks have altered address headers of D4 AA 96 instead of the normal D5 AA 96. The first byte of the address epilg on all tracks has been changed to AF, but the second byte changes randomly from track to track.

Some research into my back issues of *COMPUTIST* - specifically Jim Hart's *Arcade Boot Camp* (*COMPUTIST* #44), Steve and Rod Smith's *Dave Holle Protection* (*COMPUTIST* #35), and David Alexander's *Chess 7.0* (*COMPUTIST* #48) - were just what I needed. Anyway, here's a controller for Super IOB 1.5 that will produce a good *COPYA* version of *Word Maze*.

Controller

```

1000 REM WORD MAZE CONTROLLER - 1
1010 TK = 0 : ST = 0 : LT = 35 : CD = WR
1020 T1 = TK : GOSUB 490 : GOSUB 1110
1030 GOSUB 430 : GOSUB 100 : ST = ST + 1 : IF ST <
DOS THEN 1030
1040 IF BF THEN 1060
1050 ST = 0 : TK = TK + 1 : GOSUB 1110 : IF TK < LT
THEN 1030
1060 GOSUB 230 : GOSUB 490 : TK = T1 : ST = 0
1070 GOSUB 430 : GOSUB 100 : ST = ST + 1 : IF ST <
DOS THEN 1070
1080 ST = 0 : TK = TK + 1 : IF BF = 0 AND TK < LT THEN
1070
1090 IF TK < LT THEN 1020
1100 HOME : A$ = "ALL DONE" : END
1110 POKE 47505 , 207 : POKE 47413 , 207 : POKE
47426 , 24 : IF TK / 2 < > INT ( TK / 2 ) THEN
POKE 47445 , 212
1115 IF TK / 2 = INT ( TK / 2 ) THEN POKE 47445 , 213
1120 RETURN

```

Controller Checksums

1000 - \$356B	1070 - \$A827
1010 - \$3266	1080 - \$8EE6
1020 - \$A7C4	1090 - \$0D80
1030 - \$B1C5	1100 - \$610E
1040 - \$35FA	1110 - \$542C
1050 - \$7575	1115 - \$A09E
1060 - \$A022	1120 - \$DDB0

Ⓢ What do you suggest for a ProDOS block editor? How about putting one in *COMPUTIST*? Keep up the good work on a great magazine.

P.S. You can change line 1010 to TK = 3, init a disk to boot *L.W.T* and add a Fast DOS.

Franco Panizzon

Softkey for...

Rendezvous

Peachtree Software

Requirements

- Rendezvous Disk
- Blank Disk

The softkeys given in *COMPUTIST* #28 and *COMPUTIST* #37 did not work for my version.

My version is *COPYA*-able and can be cataloged but the copied disk will hang after the first screen. This indicates a normal or at least a semi-normal DOS and all I needed to do was to disable that annoying nibble count routine.

I printed all the suspect files and after many hours found the offending code in the binary file *RGO*.

The following is the code that I modified.

```

1C1A- D0 01 BNE $1C1D
1C1C- C1 49 CMP ($49.X)
1C1E- A9 48 LDA #$48
1C20- 49 FE EOR #$FE
1C22- C8 INY
1C23- EE 00 0A INC $0A00
1C26- D0 04 BNE $1C2C
1C28- EE 68 1C INC $1C68
1C2B- D0 48 BNE $1C75
1C2D- 60 RTS

```

Notice that the BNE at location \$1C1A branches to the middle of the next line. The same occurs at \$1C26 where the BNE branches to the middle of the \$1C2B statement. Let's see what happens when we follow these branches:

```

1C1D- 49 A9 EOR #$A9
1C1F- 48 PHA

```

and

```

1C2C- 48 PHA

```

In both cases, it pushes phony data onto the stack. After the RTS, the CPU looks to the stack to find the location from which it came. However, it jumps to the wrong location and the program hangs. Also notice the BNE to \$1C75 which reads:

```

1C75- A6 34 LDX $34
1C77- BD 8C C0 LDA $C08C.X

```

The location C08C gives it away (direct use of the disk drive).

To circumvent the problem I first tried simply putting an RTS at location \$1C1A. The program ran farther but still crashed. I found that it needed the INC \$0A00 and the INC \$1C68 to run properly.



1 Use *COPYA* to copy *Rendezvous* onto your blank diskette.

2 Fix the file *RG0*.

BLOAD RG0

CALL -151

1C1A:EE 00 0A EE 68 1C 60

3D0G

BSAVE RG0,A\$1B00,L\$04F0

Now let's see if I can dock this thing without running out of fuel.

A.L. Head

† *Softkey Addendum for...*

Silent Service

MicroProse

Since the *Silent Service* softkey (COMPUTIST #50) another release of *Silent Service* has come to my attention. In this release, the protection is exactly the same as previously described except that the files ** and *P* are relocated on the disk.

Backup this release by following the step-by-step procedure previously given but with the following change to the edits:

Trk	Sct	Byte(s)	From	To
\$05	\$09	\$3B	4C 3D 02	4C 9D 02
\$07	\$06		08 95 85 68 60	A9 95 85 32 60
				F7 A9 18 85 02
				60 F9

This release suggests that additional releases might be forthcoming that continue to relocate the files. If neither of the edits given are successful, use your sector editor to scan the disk for the two appropriate strings and edit them as shown below:

Find 4C 3D 02 4C C2 and change it to 4C 9D 02.

Find 08 95 85 68 60 and change it to A9 95 85 32 60 F7 A9 18 85 02 60 F9

That's all folks.

The Island Boys

Block-edit without a Block-editor

A group of us here at the desk of the Island-Boys used one of your softkeys to deprotect *Music Construction Set*.

One problem: what are people without block-editors supposed to do?

We found a novel solution for by-passing this obstacle. The idea is to load the ProDOS

file containing the protection, make the necessary adjustments in memory, and write the changed file back to disk. Here's how it goes...

Softkey for...

Music Construction Set

Electronic Arts

1 Boot a ProDOS 8 disk and get into BASIC (use system utilities or equivalent).

2 The protection is in the file *JIMSCODE*. So...

BLOAD JIMSCODE,A\$2000

3 Leap into the monitor:

CALL -151

4 The protection is located at memory location \$21CF. We are changing the bytes at \$21CF from 49 20 to EA EA in order to change the disk check:

21CF:EA EA

This code can be viewed by typing **2100L**.

5 Write the newly modified *JIMSCODE* back to disk:

BSAVEJIMSCODE,A\$2000,E18944

Don't forget to put a write-protect slide in the 'off' position before writing, and put it back 'on' after writing.

6 Enjoy this weak music program, if you can.

Note To modify any of the files on the disk without a block editor, copy the files to be changed onto a 5 1/4" diskette, make the edits using a sector-editor, and copy it back onto the 3 1/2" disk.

Then pick up a block editor as soon as possible (*Pro-Byter* from Beagle Bros will do).

Hgs Softkey for...

GBA 2-on-2 Champ. Basketball

Activision

GBA Basketball is a really good game with outstanding sound effects and graphics. After trying to make sense out of the protection, we stumbled upon this four-byte crack.

1 Make a copy using any copier (we used *Copy II Plus*).

2 Whip out your block editor (we used *Pro-Byter*) and read in block 608, part b.

3 Search for the pattern xx 50 20 F6 4F 35. This pattern (MPv05) should be found at byte 157.

4 Change byte 157, or wherever the M might be, to EA.

5 Write it back to disk. You now have a deprotected copy.

Playing Tips for...

Tass Times In Tonetown

- Get a job with the Tonetown paper.
- Waterfalls aren't walls.
- Follow Ennio's instincts.

Playing Tips for...

Thexder

- Not all walls are solid; and some things are known to live in them.
- Some robots give you energy and Enmax points.

Playing Tips for...

Manic Mansion

- The purple tentacle wants some food with a waxy aftertaste.
- Jars are meant to hold water.
- Where would you hide a key?
- The package is by the mailbox.
- Nurse Edna's room has an upstairs.
- Paint Thinner can open unseen doors.

Playing Tips for...

King's Quest

- The mushroom is on an island only birds can reach.
- Tree climbing is good for your health.
- Sir Graham should try his luck in a well to see his reflection of being a king.
- Sleeping giants are worth the wait in gold.

Playing Tips for...

Autoduel

- To get a lot of money, do this:
- Make a really cheap car at the assembly.
- Store it in the garage.
- Type the number for Take A Car Out Of Storage.
- Wait until the list of cars appears.
- Take out the Autoduel Player disk.
- Insert ANY DOS 3.3 disk with something on it.
- Select the number of your cheap car.
- Once the car is loaded from the DOS disk, take it out.
- Put the Player Disk back in.
- Type **[C]** to see the car (what a mess!).
- Sell it at the salvage yard.
- You should get a bundle for it. That's it.



Jerome Thelia

Softkey for...

Spy vs Spy I, II

Avantage

■ Requirements

- COPYA or similar
- a sector editor

Avantage software was nice enough to release *Spy vs Spy I* and *II* on the same disk a while back. A menu immediately after the boot asks which of the two you would like to play, then goes on to load one of the games into memory, performing a protection check before execution.

the nice thing about this protection check is that both games load it into memory from the same place on the disk. Therefore, we need only alter this one check to deprotect two seemingly separate disk-checks.

A boot-trace using the *Locksmith* Trace function reveals a JMP \$0168 to a crash routine if this check is unsuccessful.

The solution is to NOP out the JMP and allow the code to move onto the next instruction which resumes normal execution of the game.

1 Copy the original with COPYA or any fast disk copier.

2 Perform the following sector-edits:

Trk	Sct	Byte(s)	From	To
\$00	\$06	\$F0-F2	4D D8 01	EA EA EA

Softkey for...

2400 AD

Origin Systems

■ Requirements

- 2400 AD
- Super IOB
- a blank disk

2400 AD is one of the latest releases from Origin Systems and bears a great resemblance to the *Ultima* series. Although all the graphics are drawn differently, anybody who's played one of the *Ultimas* will experience some kind of *deja vu*. Let me qualify that by adding that it does not take anything away from this fine game which is challenging and a pleasure to play.

I expected the protection to be similar to other Origin Systems games but was mildly disappointed when my *Ultima IV* controller did

not create a deprotected version. The protection is a little less harsh than *Moebius* or *Ultima IV* in which the address prolog changes on every track.

In 2400 it alternates between the standard D5 AA 96 and D4 AA 96 on every other track. With this in mind, I simply altered my *Ultima IV* controller for the changing address prologues. The controller also starts on track \$00, ignores address and data epilogues and is set to read an abnormal RWTS read-translate table.

After running the controller on the original, I booted it up expecting to be searching for an avalanche of sector edits I would have to implement before it would run. Amazingly, my backup ran flawlessly and I began to play the game on my merry way.

This apparent lack of any disk checks has made me highly suspicious however and I will watch for and report any hangups in the later stages of the game and would encourage anybody who runs this controller to do the same.

1 Run the controller on side A of the game (side B is not protected).

2 Enjoy the game.

The character can be found on track \$22, sector \$00 of the player disk. The attributes are in hexadecimal and money is stored in this manner:

```
Byte(s)  Value
$C4_C5  01 00  = 100 credits
```

Controller

```
1000 REM 2400 A.D. CONTROLLER
1010 TK = 0 : LT = 1 : ST = 15 : LS = 15 : CD = WR
1020 POKE 47405, 24 : POKE 47406, 96 : POKE
      47497, 24 : POKE 47498, 96
1030 POKE 47829, 3 : T1 = TK : GOSUB 490
1040 GOSUB 190 : C = C + 1 : GOSUB 610
1045 IF C = 2 THEN GOSUB 2000
1050 TK = TK + 1 : LT = LT + 1 : IF PEEK (BUF) < MB
      AND TK < 35 THEN 1040
1060 POKE 47405, 208 : POKE 47406, 19 : POKE
      47497, 208 : POKE 47498, 183 : POKE 474829,
      213 : GOSUB 230
1070 TK = T1 : LT = 35 : GOSUB 490 : GOSUB 610 : IF
      PEEK (TRK) = LT THEN 1090
1080 TK = PEEK (TRK) : ST = PEEK (SCT) : LT = TK
      + 1 : GOTO 1020
1090 HOME : PRINT "COPY DONE" : END
2000 RESTORE : C = C - 2 : RETURN
5000 DATA 213, 170, 150
5010 DATA 212, 170, 150
```

Controller Checksums

1000	- \$356B	1060	- \$A3A2
1010	- \$F550	1070	- \$0ED7
1020	- \$C466	1080	- \$BDCB
1030	- \$59D7	1090	- \$2302
1040	- \$7C0D	2000	- \$4EC7
1045	- \$DEC7	5000	- \$3F7D
1050	- \$A6BD	5010	- \$D4F5

Here are a few quick softkeys that might be useful to some COMPUTIST readers:

Softkey for...

Law Of The West

Accolade

1 Copy with a fast copier.

2 Make the following sector-edits:

Trk	Sct	Byte(s)	From	To
\$00	\$0B	\$22-23	A0 09	18 60

Softkey for...

Below the Root

1 Copy with a fast copier.

2 Make the following sector edits on side one:

Trk	Sct	Byte(s)	From	To
\$00	\$05	\$3D-41	?	00 FF D1 5E 7B

Softkey for...

Einstein Compiler

1 Copy with COPYA.

2 Make these sector edits:

Trk	Sct	Byte(s)	From	To
\$08	\$04	\$2A-2C	?	4C E2 91

P.S. Please add *Legacy Of The Ancients* from Electronic Arts (EA) to your Most Wanted list. Since the protection is very new to EA, and the game is very challenging to play, perhaps one of your staff members would like to tackle it. This protection could be the new trend for EA releases to follow and the game a classic among past releases.

I would be willing to submit my original to give your staff a "crack" at it.



Please DO NOT SEND ANY ORIGINALS or copies to COMPUTIST.....RDEXed

Matt Ownby

Playing Tip for...

Summer Games



When you're doing the pole vault event, select a medium pole grip. Start running and when the man appears on screen, push the joystick down. Immediately after that, push it up. He should have his legs in the air ready to go over the bar. Before he even reaches the bar, press the button and let him drop. Even though he didn't go over the bar, the game will think he made it over. This will let you get the world's record.

A.P.T. for...

Where in the World is C. Sandiego

To edit the number of cases that you've solved in *Where In The World Is Carmen Sandiego?*, read track \$22, sector \$00 off of side B (a copy or the original is fine). it will list all of the detective's names.

After you've decided which one to edit, go to the end of their name and move over until you're one byte away from the next detective. That is the number of cases that you've solved.

A note on one of Brian Troha's articles in *COMPUTIST #49* page 15: On my version of *Tass Times in Tonetown* there is **no protection**.

A.P.T. for...

Ultima IV

Since Danny Pollak's *Ultimaker IV* in *COMPUTIST #30* failed to work on my IIGs, I made a way to edit the characters using a sector editor instead.

Each byte is different with each character. For example, character #2 starts at byte \$34 while character #8 starts at \$F4. In that case we will call the first digit of each byte the letter z. The value of z for each character is....

Character #	1	2	3	4	5	6	7	8
Z value	1	3	5	7	9	B	D	F

Table 1 Read track \$04, sector \$04:

Byte	Effect	number possible
\$z4	Sex	1 (\$5C=Male, \$7B=Female)
\$z5	Type	0-7 (Table 2)
\$z6	Health	4 (\$C4=D, \$C7=G, \$D0=P, \$D3=S)
\$z7	Strength	0-99
\$z8	Dexterity	0-99
\$z9	Intelligence	0-99
\$zA	Magic Points	0-99
\$zC-zD	Hit Points	0-9999
\$zE-zF	Max Hit Points	0-9999
Note: Now add 1 to z...		
\$z0-z1	Experience	0-9999
\$z2	Weapon in use	1-F (Table 3)
\$z3	Armor in use	1-7 (Table 4)

Table 2 Types of characters

0	Mage
1	Bard
2	Fighter
3	Druid
4	Tinker
5	Paladin
6	Ranger
7	Shepherd

Table 3 Armor

0	None
1	Cloth
2	Leather
3	Chain
4	Plate
5	Magic Chain
6	Magic Plate
7	Mystic Robe

Table 4 Weapons

0	Hands
1	Staff
2	Dagger
3	Sling
4	Mace
5	Axe
6	Sword
7	Bow
8	Crossbow
9	Flaming Oil
A	Halberd
B	Magic Axe
C	Magic Sword
D	Magic Bow
E	Magic Wand
F	Mystic Sword

Table 5 Supplies

Read from track \$14, sector \$03

Byte	Item	Category	Amount
0C	Torches	Guild item	0-99
0D	Gems	"	"
0E	Keys	"	"
0F	Sextants	"	"
10	Stones	(Stone)	0-FF(255)
11	Runes	(Rune)	"
12	Bell, Book, & Candle	(Items)	0-7
13	3-part key	"	"
14,15	Food	0-9999	
17,18	Gold	"	"
19	Silver Horn	Artifacts	0 or 1
1A	HMS wheel	"	"
1B	Evil Skull of Mondain	"	"

1D	Cloth	Armour	0-99
1E	Leather	"	"
1F	Chain	"	"
20	Plate	"	"
21	Magic Chain	"	"
22	Magic Plate	"	"
23	Mystic Robe	"	"

25	Staff	Weapons	0-99
26	Dagger	"	"
27	Sling	"	"
28	Mace	"	"
29	Axe	"	"
2A	Sword	"	"
2B	Bow	"	"
2C	Crossbow	"	"
2D	Flaming Oil	"	"
2E	Halberd	"	"
2F	Magic Axe	"	"
30	Magic Sword	"	"
31	Magic Bow	"	"
32	Magic Wand	"	"
33	Mystic Sword	"	"

3C	Sulphur Ash	Reagent	0-99
3D	Ginseng	"	"
3E	Garlic	"	"
3F	Silk	"	"
40	Blood Moss	"	"
41	Black Pearl	"	"
42	Nightshade	"	"
43	Mandrake Root	"	"

44	Awaken	Spell	0-99
45	Blink	"	"
46	Cure	"	"
47	Dispel	"	"
48	Energy Field	"	"
49	Fireball	"	"
4A	Gate Travel	"	"
4B	Heal	"	"
4C	Ice Ball	"	"
4D	Jinx	"	"
4E	Kill	"	"
4F	Light	"	"
50	Magic Missile	"	"
51	Negate	"	"
52	Open	"	"
53	Protection	"	"
54	Quickness	"	"
55	Resurrect	"	"
56	Sleep	"	"
57	Tremor	"	"
58	Undead	"	"
59	View	"	"
5A	Wind change	"	"
5B	x-it	"	"
5C	y-up	"	"
5D	z-down	"	"

If you want to know how to edit the eight virtues, look in *COMPUTIST #43*.



Jeff Hurlburt

THE PRODUCT MONITOR

Ratings

★★★★★	SUPERB
★★★★	EXCELLENT
★★★	VERY GOOD
★★	GOOD
★	FAIR
☹	POOR
☹☹	BAD
☹☹☹	DEFECTIVE

Deluxe Paint II

by D. Silva & B. Iverson
\$99.95 Electronic Arts



Requires:

- 768K Apple IIs
- one 3 1/2" drive
- mouse
- second drive (optional)
- Imagewriter II printer (optional)

In case you 'missed the movie', "Electronics Arts Strikes Back" has been re-released as *Deluxe Paint II*, a heavy-duty, blow-the-competition-away drawer/painter package including the first of several "Art Parts" volumes.

Boasting such advanced capabilities as perspective generation, stencil-making, and color cycling, this is the first Apple painter to venture seriously into the arcane realm of video processing.

With *Deluxe Paint II* you can work upon displays spanning up to 400 vertical lines (two screens) in either 16-color 320-dot or 4-color 640-dot mode. LOAD and SAVE, but not DELETE, operate for standard unpacked \$C1 type files and for files packed in something

called "Apple Preferred format". While not the most efficient of pic compressors, the latter is a great space saver. Unfortunately, you will have to look elsewhere for unpacker documentation if you plan to incorporate any of the packed pictures in your programs.

Printout can be multi-color or monochrome on Imagewriter II, at present the only printer supported. Other output options are Appletalk and modem.

The, by now, 'standard' tools are all here-- including variously shaped and sized brushes, sprays, line drawers, fills, and assorted shapes (filled and unfilled), plus a not-so-standard zoomable magnify.

Text fonts, which come in six styles, are available in bold, underline, and outline variants and several popular sizes.

Cut/paste and copy may be to and from a clipboard or a 'spare page'. These, along with flips, stretches, rotations (about X, Y, and Z axes), and a super-flexible symmetry tool are all accomplished via user-defined "custom brushes". Any part or all of a graphic can be lifted and used as the current brush for painting, fills, etc.; and perspective routines permit setting viewpoint for easy creation of realistic depth and distance effects. "SAVE BRUSH" and "LOAD BRUSH" move a brush (and its palette) to and from disk without affecting the current graphic-- very nice for handling selected picture pieces, whether or not they actually function as "brushes".

Whereas the above approach rates the much coveted Computist Programming Brilliance Award, a strong rival is the powerful set of stencil-making commands. Basically, you can "lock" one or more colors to protect parts of a graphic from painting, sprays, fills, etc. thus creating a stencil or "frisket". Colors may be locked or unlocked at any time; and, as with brushes, stencils can be saved and loaded to disk.

Deluxe Paint II includes comprehensive palette adjustment controls but no provision for linking pic frames to produce animation. You can, however, achieve simple animation and other interesting effects via color cycling. A technique which rotates palette color positions at a user-selected rate, cycling is great for making waterfalls churn, balls bounce, and propellers whirl.

With pull-down menus, clickable tools, etc., the utility is almost entirely mouse driven, though you will need arrow keys to move the display when your work area extends beyond a screen or for positioning when using the magnify option. Since practically all commands are also accessible via keyboard, clearing menu and tool bars results in an unobstructed, fully active work area.

By far the most natural feeling, easiest to use of all Apple painter utilities, *Deluxe Paint II* is also among the best supported.

First, an excellent tutorial moves you swiftly into practical applications; then "Art Parts" volumes (\$29.95 each) supply a bonanza of clip art, brushes, lettering sets, and-- most important-- new ideas. Included are holiday motifs, plants, animals, exotic pattern sets, ships, and fantasy figures-- just for starters. Very classy; but then, among IIs painters, *Deluxe Paint II* is THE class act.

Welcome

by D. Fudge & M. Smith
\$79.95 Abracadata



Requires:

- 64K Apple II series (or Apple IIs set to monochrome)
- one 5 1/4" drive
- mouse
- second drive (optional)
- joystick/paddle for graphics (optional)
- printer (optional)

As any business manager, club leader, or department chairman knows, a recurring bottleneck to achieving organizational aims is faulty within-organization communications. Targeting this problem, Abracadata has created *Welcome!*, a kind of do-it-all "electronic handbook" for storing and communicating information.

Linking a collection of no-frills, get-the-job-done text and graphics utilities, *Welcome!* produces three types of output. Running the "Manager Disk", a person responsible for arranging and disseminating information can generate displays, printouts, or "Data Disks". The latter may be accessed, but not significantly altered, by other personnel running a "User Disk" copy.

Text utilities guide production of directories (e.g. phone and mailing lists) besides helping organize such information as goals, departmental relationships, rules, benefits, etc... Organization charts, conference maps, device schematics, and other graphics are produced via line/box-drawing and labeling tools. Text and graphic information may be sorted, displayed, and output as hardcopy by both the "Manager" and "Users", greatly easing such productions as an orientation booklet for new employees.

Including manual, "Manager"/"User" diskette, and an example-filled "Data Disk", *Welcome!* features pull-down menus with fully integrated mouse access and supports virtually every Apple-compatible printer and interface.

Solid plusses are simplicity and ready availability of so many dissemination functions; and the 'Manager-User' approach promotes efficient, controllable sharing of database access. On the other hand, *Welcome!*'s 40-column-only TEXT is bound to disappoint those accustomed to an 80-column display; and there are many easier to use, more powerful utilities when it comes to developing graphics. Perhaps of most significance to an image-conscious manager, the program's outputs are decidedly bland-- not the way to 'fire up' new employees or anyone else. Neat, yet lacking pizzazz, *Welcome!* is a good idea, but only a mediocre implementation.

Create A Calendar

by Designer Software
\$39.95 Epyx



Requires:

- 64K Apple II series
- one 5 1/4" drive
- printer
- second drive (optional)

Hardly anything is better for getting your affairs in order than a calendar, especially if the highlighted dates are the ones you decide are important. With Epyx's *Create a Calendar*, birthdays, club meetings, appointments, holidays-- whatever-- can become attention-catching calendar EVENTS.

Compatible with most popular printers (Imagewriter, Epson, Star, ...), this versatile utility produces calendars in five formats. Printing a month, week, or pair of days per sheet, you can enter text and graphics for each date with plenty of space left for jotting notes. Of the (dates only) annual formats, a one-sheet version is handy for quick date-finding; and the six-sheet horizontal "banner" makes an attractive wall reference.

Create a Calendar employs *Printshop*-compatible graphics, fonts, and borders (including those available on Epyx's own *Scrapbook* diskettes)-- plus fonts, borders, and holiday/event graphics supplied on side two of the program diskette. Step-by-step, explicit prompts and an illustrated manual make entry and editing of key dates a breeze. One option adds standard holidays; and a "Repeat Date" function allows a single entry, such as a meeting of the Apple Users Group every second Saturday, to be repeated automatically over a range you specify. If requested, the program will also produce a listing of all events entered on the current calendar. Dates, text, and names

of selected graphics for a calendar can be saved on a separate data diskette. One hint: since the printout routine has to be able to reload any graphics, it's a good idea to note the source diskette for each during editing.

Results are impressive-- much better, of course, than store-bought calendars. One notable flaw, actually the only one, is omission of automatic moon phase entry; gardeners and other concerned users will have to place these manually. Fun to use, with loads of room for creative expression, "Create a Calendar" is good until 9999 A.D.; whereupon you should request the version 2.0 update. Even so, not a bad value.

Diversi-Cache

by Bill Basham
\$35 Diversified Software Research



Requires:

- 512K Apple IIs
- one Apple Disk 3 1/2" drive
- one 5 1/4" drive
- additional drives (optional)

'Old time' Apple II computists will, no doubt, recall the amazement felt upon first booting a Beagle Bros./ProntoDos-patched diskette. Suddenly, stodgy old DOS 3.3 seemed to 'come alive' with programs loading in a fraction of pre-conversion time. Now, thanks to DSR's *Diversi-Cache*, IIs owners can experience much the same thrill of souped-up performance.

Diversi-Cache speeds up Apple Disk 3.5 I/O in two ways. First, whenever the current operating system does a 'block read', *Diversi-Cache* actually reads-in the entire track; second, you can activate a buffer (or "cache") which 'remembers' everything read from the designated drive up to the limit of buffer capacity. The result is super-rapid access upon subsequent reads of files with blocks on the cached tracks. According to on-disk (text file) documentation, whether or not you enable the cache feature, DSR's track-read approach "... triples the speed of disk reads and doubles the speed of ProDOS writes". Only Apple Disk 3.5 drives are affected, not UniDisk 3.5 or 5.25" drives.

Though supplied on a 5.25" ProDOS/8-format Master diskette, *Diversi-Cache* is said to be compatible with "any operating system", including the mini-disk variants of DOS 3.3; so there are several routes to installation. Upon booting the Master, a STARTUP menu option allows appending the

utility to the PRODOS file on a diskette in the slot and drive you specify. When booted, the patched ProDOS (/8 or /16 1.1-1.2) automatically installs *Diversi-Cache*. (Another option, incidently, permits removal of the patch.)

Diversi-Cache may also be installed via a BRUN CACHE or launched as a ProDOS SYS file. Finally, if requested, the Master STARTUP will write the necessary routines directly into memory. *Diversi-Cache* resides in bank 02 and is not deactivated by a 'warm start' boot.

Once installed, "Cache" appears as a desk accessory along with "Control Panel", etc. when you press **⌘ESC**. Here you may set buffer size (0-800K), drive(s) to cache (1,2, or "both"), or even turn-off *Diversi-Cache*. The "both" cache option is actually "either", since switching from one drive to the other clears the buffer.

When first activated, *Diversi-Cache* normally defaults to the largest buffer size available and selects drive 1 as the cache drive. Chiefly to permit large, memory-hungry applications to act as installers, a Master diskette "Reconfigure Cache" option lets you set default buffer size along with default cache drive. (Recommendation: do this only on a copy of the Master.)

I tried out *Diversi-Cache* on several diskettes including an assortment of ProDOS/8 utilities, *Deluxe Paint II* (ProDOS/16 1.1) and "ORCA/M" (a ProDOS/16 1.2-based 65816 assembler from Byte Works). With buffer size at 0K-- to check the 'built-in' speed boost-- things certainly went faster, though the x3 read and x2 write speed figures only obtain for relatively large, reasonably contiguous files. (Reading a track instead of a block doesn't help much if the file is one or two blocks in length or a large file spread out all over physical diskette space.)

Performance, however, is hardly shabby. For example, load time for *Appleworks 2.0* dropped from 19 to 9 seconds; and access to an AWP file went from 4 seconds to 2. In an ideal case-- a single, large picture file-- load time did, indeed, go from 6 to 2 seconds.

As expected, the multiplier is smaller for boots, especially for ProDOS/16 applications, which tend to spend alot of time finding, loading, and arranging a host of set-up files. Still, the time saved is sure to be appreciated. A typical case is *Deluxe Paint II*, where load time (selector + program) dropped from 134 seconds to 96. Booting the program as a *Diversi-Cache* installer (as opposed to having *Diversi-Cache* active before the boot) added no observable delay.

Running with an active buffer, even a relatively small one, turns out to make a world of difference.



With buffering at 256K, *Deluxe Paint II* total boot time drops to 70 seconds!; and when moving back and forth among several ProDOS/8 utilities (cache = 800K), response quickly approached ramdisk speed. (Unlike ramdisk, *Diversi-Cache* allows drive turn-on, which adds a slight delay.) Possibly more impressive is the affect on *ORCA/M*. Imagine, an editor/assembler/linker system that becomes increasingly interactive with use!

Diversi.Hack

Included free with *Diversi-Cache* is a neat little desktop utility named "Diversi-Hack". With it, you can interrupt any program which doesn't disable desktop access and dump screen text or send keystrokes to your printer. The utility also lets you enter the monitor-- perhaps to examine and modify program variables-- then return to the desktop and resume execution.

The *Diversi-Cache* with "Diversi-Hack" Master diskette is unprotected, with shareware distribution encouraged. That is, copy recipients, who decide to keep and use the software, send-in the purchase price to DSR receiving, in return, a user number and low-cost updating privileges. Actually, I can't think of a better 'protection' scheme. At twice the price of "Cache" + "Hack", nothing you plug-in or boot-up can do more to enhance the performance of your IIs.



Requires:

- 64K Apple II series
- one 5 1/4" drive
- joystic (optional)

Remember all those times your favorite comic book hero seemed about to close down the forces of evil, only to stumble into some 'obvious' trap.

Well, now you can work off years of frustration guiding the moves of Steve Keene, thrillseeker in an honest-to-goodness comic book adventure complete with 'balloon' dialogue and up to four animated frames per hires screen.

In *Accolade's Comics*, the frames appear one-at-a-time as you select Keene's script and make other choices which affect the course of this pulp-grade, rescue-the-kidnapped-scientist scenario. With six diskette sides, there's ample room for branching, sometimes into very

different story lines, often into deadly peril. Besides the expected cast of dastardly no-goods, eight challenging arcade hazard sequences are just waiting to be sprung. (eg. Keene vs. the robots, Keene swinging over a pool of sharks, etc., etc.)

Though you begin with five lives, it's just as well that a game-save option is included and that the arcades can be practiced separately.

Fast-moving and clever, *Comics* offers good artwork and entertaining, multiple-replay adventuring. Add humor and well-executed arcades, plus the incentive of a High Scores roster maintained on-disk, and you have just the kind of action-packed 'reading' ardent comic book devotees dream of. (*Bubblegum not included.)

Fast Frames, ETC.

Invisi-clues

Recognizing that hard core adventurers are unlikely to move on to new challenges with old ones hanging, Infocom now offers an "Invisi Clues" hint booklet (\$7.95) for each text adventure. The typical package includes a map plus booklet with key questions (e.g. "Where is the third magic jewel?") arranged in roughly chronological order. Beneath a question are three or more increasingly specific hints, each revealed by over-wiping the selected space with a yellow marker supplied in the package. You decide how much of a clue to request with no worry about stumbling across solutions to other puzzles.

Clip Art Gallery #1

Activision's *Clip Art Gallery #1* (\$29.95) is a newly released horizon-expanding collection of *Paintworks Plus*-compatible graphics on 3.5" media. Here you will find borders, alphabet sets, and patterns along with animal, school, and sports groups plus much more-- roughly 600 graphics in all! Incidentally, *Paintworks Plus* (version 1.1) now accepts "Apple Preferred format" packed files (as well as unpacked \$CI type and original version packed files). This means '1.1' users can directly access most Electronic Arts "Art Parts" materials.

Destroyer

Epyx's *Destroyer* (\$39.95 for 128K) is a *GATO*-type naval combat/strategy arcade featuring beautiful double-hires graphics with good animation and sound. Action sequences include searches, anti-aircraft fire, depth charge runs, and more. Unfortunately, all of this neat stuff greatly exceeds allotted memory space; so you have to put up with numerous annoying disk access delays, moving with painful slowness

from section to section in the heat of combat. Playability, of course, craters. Too bad; but this is no way to run a ship.

The Spy's Adventures in N. America

Penguin/Polarware's *The Spy's Adventures in North America* (\$17.95) involves 1-6 players in a race to nab the demented trouble-maker, Dr. X. Moving through up to 27 regions in the U.S., Canada, and Mexico, you view beautifully done scenes (in double-hires on 128K machines), read brief, travel brochure descriptions of area highlights, and contact mysterious agents for clues to Dr. X's hiding place. Great parlor-gaming/geography-learning fun, *The Spy's Adventures* series also includes editions covering Europe, South America, Asia, Africa, and the Pacific Islands. (for 64K/128K Apple II series)

Homework Helper: Math Word Problems

Recognizing that even fairly successful students can be stymied by word problems, Spinnaker has come to the rescue with *Homework Helper: Math Word Problems* (two diskettes, \$49.95). Accessing an extensive problems library, the program provides step-by-step guidance in solving those ever-popular "age", "distance", and "mixture" toughies, PLUS allowing you to enter your own problems and even obtain printouts. A hi-res screen fill-in-the-knowns-and-unknowns format encourages developing an organized approach, while a user-friendly "Algebra Calculator" solves the equations you create. (requires 64K, printer optional)

Tips

For nice, compact printouts of DSR on-disk documentation, all you need is the machine code quickie listed below and a word processor that can accept TXT files as input.

CALL -151

```
0300: A0 00 84 03 A9 10 85 04
0308: B1 03 C9 0D D0 09 A9 0A
0310: 91 03 20 1D 03 B0 05 20
0318: 1D 03 90 EC 60 E6 03 D0
0320: 02 E6 04 A5 04 C9 70 60
0328: 00 00 00 00 00 00 00 00
BSAVE NOCR, A$300, L$28
```

It replaces each line-ending CR with a SPACE to allow full-page, 17 cpi printouts. Paragraph-ending CR's are not affected.

To use it with *Diversi-Cache* documentation just:

```
BLOAD CINST,TTXT,A$1000
```

```
CALL 768
```

```
BSAVE CINST,TTXT,A$1000,L10000
```

(Any TXT files larger than 48 blocks should be split.)

Vendors

AbracaData
P.O. Box 2440
Eugene, OR 97402
(503-342-3030)

Accolade
20813 Stevens Creek Blvd.
Cupertino, CA 95014
(408-446-5757)

Activision
P.O. Box 7287
Mountainview, CA 94039
(800-227-9759
in California call 415-940-6044)

Diversified Software Research
34880 Bunker Hill
Farmington, MI 48018-2728
(800-835-2246, ext. 127)

Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
(415-571-7171)

Epyx
600 Galveston Drive
P.O. Box 8020
Redwood City, CA 94063
(408-745-0700)

Infocom
125 Cambridge Park Drive
Cambridge, MA 02140
(800-262-6868)

Penguin Software
2600 Keslinger Road
P.O. Box 311
Geneva, IL 60134
(312-232-1984)

Spinnaker
One Kendall Square
Cambridge, MA 02139
(617-494-1220)

John Wiegley

A.P.T. for...

Lode Runner

Getting More Men

Getting additional men for *Lode Runner* is a easy task. We simply locate where the program loads the number of men (\$05) and change it to FF.

First I used *Copy II Plus*'s catalog feature to find the load address and length of *Lode Runner*. These are A\$800 and L\$8100. The program starts at \$800 and ends at \$8900 (\$800 + \$8100).

I booted a DOS 3.3 disk, inserted *Lode Runner*, bloaded the file and entered the monitor:

BLOAD LODE RUNNER CALL -151

I then searched for the bytes that load the number of men using the monitor search command. In machine code, a direct load of the A-register (accumulator) with five would be \$A905. The monitor search command looks for an address so we need to reverse the two hex bytes for everything to work out right. Search for \$05A9 between the limits of \$800 and \$8900.

05A9<800.8900S

This search resulted in three possibilities:
296E- 43AA- 4496-

I checked each of these locations and found that 296E and 4496 subsequently stored the 05 to the same location. I changed the 05 to FF in both these numbers and it worked.

There was one other minor problem. DOS doesn't allow a binary save with a length value greater than \$8000. However, a simple poke will change that limit to \$FFFF.

1 Change the binary length limitation.

POKE 43364,255

2 Insert your *Lode Runner* disk and type:

BLOAD LODE RUNNER

CALL-151

296F:FF

4497:FF

BSAVE LODE RUNNER, A\$800, L\$8100

4 Enjoy.

A.P.T. for...

Wizardry III

Transferring Characters From Wizardry I & II to Wizardry III

■ Requirements

- Wizardry III* Scenario Disk and Boot
- Initialized disk
- Blank disk
- A sector-editor

It's a bit more difficult to retain character values when transferring people from *Wizardry 1* or *2* to *Wizardry 3*.

Use your Sector Editor and read Track \$1A, Sector \$0F. Start looking at the sectors around this area until you find your characters names flashing, the characters are each about 3/4 sectors long. If you find one where the character's name is at the top you are lucky. If you find one where it is half way down or at the bottom, you will have to look around on other sectors nearby or not so nearby for the rest. When you find the rest of the character look at the two bytes just preceding the next character's name (or actually the byte that denotes length of the next character's name) and write down these bytes. Now if the bytes are 01 and 08, this means you have solved *Knight of Diamonds* and *Proving Grounds*. If the numbers are 01 and 40, you are a conqueror of *Proving Grounds* and the Staff of Gnilda holder. The left number is *Proving Grounds* and the right is *Knight of Diamonds*. A number one to solve the left, and a number eight to solve the right. To make the character valid in *Wizardry III* you must add \$20 to the right number.

1 Transfer *Wizardry 1* or *2* characters to *Wizardry 3*. **CAUTION:** put a write-protect tab on the disk you are transferring from and make sure there is enough room on the target disk. Do NOT attempt to take the Rite of Passage! This will make it so you cannot have characters like your old ones.

2 Use your sector editor and read around track \$1A, sector \$02, track \$1A, sector \$0F, and all of track \$1B, and some of track \$1C and maybe \$1D and possibly \$1E to find your characters.

3 Add \$20 to the very last byte in the character and enter the number you get.

4 Write any sectors you changed to the disk.

5 Do this for the whole party and then load them up in Gilgamesh's Tavern and have fun!

Softkey for...

Black Magic

Datasoft

Here is an update to my last letter (COMPUTIST #48) with some other miscellaneous information.

■ Requirements

- A sector editor
- Senior PROM V3.0

If you read my last letter you probably copied *Black Magic* with the parameters I gave and found that on most backups the death screen was garbaged or you couldn't get to the High Scores or if you did they were garbage too. I have, after much work, come up with a working softkey for *Black Magic*.

1 Enter *Senior Prom's* main menu. Change the Prolog's to read:
Address Prolog : D5 AA AD
Data Prolog : D5 AA 96

Do not touch the DOS error flag option!!!

2 Copy tracks \$01-10 and \$12-22.

3 Restore the prologs and then change them again to read:

Address Prolog : D5 AA 96
Data Prolog : D5 AA AD

4 Clear the DOS error flag.

5 Copy track \$00.

6 Make the following sector edits:

Trk	Sct	Byte(s)	From	To
\$00	\$02	\$45	96	AD
\$00	\$09	\$1F	AD	96

7 Boot up the copy with *Senior Prom* on.

8 If the copy boots fine then you are done. The entire program should work.

9 If the drive grinds and the copy does not work, **RESET** and press **DELETE** to enter the monitor. Type:

1AF0L

Look at the displayed code for the three bytes 2C 50 C0. When you find them write down the exact memory location of the 2C.

10 Enter the address in sector zero as the following sector edit:

Trk	Sct	Byte(s)	From	To
\$00	\$00	\$CB-CC	00 1B	(see note)

Note: Take the address you found, for example \$1AFF, and reverse the digits to make FF 1A. Enter these two numbers in bytes \$CB and \$CC.

11 You can now enjoy a deprotected version of *Black Magic*.

For those who are proficient at *Senior PROMing*. I found the bytes that store: The number of arrows in each box (presently random), the number of spells you have, and the number of arrows you have. With some simple sector editing you can easily make each arrow box contain 60 arrows and stop your spells and arrows from decreasing, but I don't want to spoil the challenge of trying to get Zahgrim's STAFF (hint, hint).

Hint: the bytes are stored in the zero page.

Softkey for...

Amnesia

Electronic Arts

This is for all the other people who tried to run my deprotected version of *Amnesia* found that you couldn't take anything! To fix this problem, recopy the disk and make the following different sector edit:

Trk	Sct	Byte(s)	From	To
\$09	\$04	\$AE-AF	D0 A7	D1 A6

This will defeat the checksum and install a harmless compare function which has no effect on the program.

Get Better Sound by using the cassette jacks

Have you ever wondered why Apple put cassette ports on the back of the Apple when hardly anyone who has disk drive uses them? I have found a very useful function for these ports.

First of all any program which can come out of the cassette port can be run through an earphone. Plug the 3.5mm end of the earphone in the port closest to the right side of your computer. Then just choose the cassette option, such as in *Wavy Navy* and in *Music Construction Set*, and listen in through your earphone. You can also tape what you play by plugging one end of a cord with a 3.5mm plug on both ends in the OUT jack (the one closest to the right) and the other end the MIC jack (the larger microphone hole on the cassette player). Then just press PLAY and RECORD while the music is playing.

For those who already know this I will tell you something you probably do not know. You can convert any deprotected machine language based program to play through the cassette jack. Wonder how? I'll show you:

All sound on the Apple II (except for Mockingboards and other sound cards) toggle the location \$C030 in ROM to produce a click. When this location is toggled repeatedly, it produces a tone. These tones are used to create music. The cassette sound production works exactly the same but with the location \$C020.

By changing the number \$C030 or the bytes \$30 C0 to \$20 C0 all sound generated runs through the cassette OUT port and can be recorded. To do this just use a sector editor with a scan feature to scan for all occurrences of 30 C0.

Check all occurrences and if a 2C or AD precedes the 30 C0 then change the 30 to a 20 and write the sector back. Do this to the whole

disk and when you boot it up, every sound the program generates will be converted to the cassette OUT jack or to your earphone or tape player.

Making a fast boot disk

■ Requirements

- Sector editor
- 48K slave disk (blank)
- A favorite machine language utility that is under 33-sectors long and does not require DOS commands

If you read the article in *COMPUTIST #44* you probably said "Great, but what if my routine requires reading and writing to the disk?". I have a semi-simple answer to that question (or not so simple to beginners).

First what you need is a disk that will load the RWTS and then immediately beginning executing your program.

To solve you need the boot sector of 48K slave disk that just reads RWTS into \$B600-BFFF. You also need a machine language utility (that you use a lot or you wouldn't be going through this trouble) that is 32 sectors or less and does not require DOS commands.

I first did this with *Locksmith* Fast Disk Copy, which I converted into a file with *COMPUTIST #43* and it now boots in 3.5 seconds. I will now begin the lengthy explanation of how to do this.

Start with a blank 48K slave disk. Find out how many sectors it takes up and use the following chart to make a simple sector edit:

If your utility is 15 sectors or less convert the sectors used into the following two bytes:

First before I give you the chart, do this. Get the number of sector the file takes up in the catalog. Convert this into a hexadecimal number and minus one. This is the top sector it will need.

Use this chart to find out what byte to put in the catalog to free those exact sectors.

Byte 1: Sectors F E D C B A 9 8
0 0 0 0 1 1 1 1

The above binary number was generated by a program that used sectors B and below. The number is 15 or \$0F. This chart is very easy to use just take the top sector and make that a one and every sector below it a one, and make every sector above it a zero. Such as this example that used sectors 9 and down

Bytes 1 & 2:
Sectors: F E D C B A 9 8 7 6 5 4 3 2 1 0
0 0 0 0 0 0 1 1 1 1 1 1 1 1 1

And convert these two numbers from binary to hexadecimal. This example happens to be the numbers \$03 and \$FF.



If your program is more than 16 sectors than just make these two numbers \$FF and do the same as we just did for track 2 but to find out the number of sectors used on track two, just minus sixteen from the number of sectors in the program. Enter the two numbers you come up with for byte 1 into these byte on track 1 1

Trk	Sct	Byte(s)	From	To
\$11	\$00	\$3C	?? ??	the two numbers

For the two bytes for track 2, if you have any, make this sector edit also

Trk	Sct	Byte(s)	From	To
\$11	\$00	\$40	?? ??	the next two

If your program takes exactly 32 sectors then all four numbers are \$FF.

Now that you have freed the tracks to the exact size specifications, boot up the disk with the program and **BLOAD** the program. Insert the disk you have been working on and **BSAVE** the program with \$4 added to the address and \$4 subtracted from the length. Type **CALL -151** and find out what the four bytes you didn't save were and write them down. Sector edit those four bytes onto the first four bytes of the starting sector minus 1 (sector 6 if it starts on sector 7). Now we are going to work on the loading.

Boot up your sector editor again and take a look at track \$00, sector \$01. Make the following changes:

Trk	Sct	Byte(s)	From	To
\$00	\$01	\$15	02	note 1
		\$1A	04	note 2
		\$48	84 9D	note 3
		\$5E	02	note 1
		\$63	04	note 2
		\$AC	CE	EE

Note 1: starting track of your program

Note 2: starting sector on starting track

Note 3: starting address of your program in low-high order (IE \$2000 is 00 20)

Write protect the tracks one and two so you can still use this disk for data. Make these sector edits:

Trk	Sct	Byte(s)	From	To
\$11	\$00	\$3C-3F	?? ?? 00 00	00 00 00 00
		\$40-43	?? ?? 00 00	00 00 00 00

Your program should now load in a matter of seconds.

A note to beginners

For those beginners to programming out there I should give you some titles to look out for. Being a probably Intermediate to Advanced programmer myself I have found some excellent programs out there that some of you haven't bought because you don't know if they are any good. Some of these are:

Senior PROM V3.0 which I have had for a year now and is my #1 favorite piece of hardware (even over my Imagewriter II) and my best utility. (you can get the sector editor up and running with its own RWTS in less than a second if you are fast).

Bag of Tricks 2 with which you can reskew disks, recover lost catalogs and files, examine tracks without having to understand all about nibble code dumps (but it helps) and it has a sector editor with a 78 COMMAND !?! help menu which has everything from macros to labels for locations on a disk.

Locksmith 6.0 with a 19 second copy program (with 64K auxiliary memory and two drives), The ability to encrypt files so no one else can look at them, and file parameters to automatically copy files. These are just a few of it's abilities.

Copy II Plus (whatever version is out now) which can do all DOS and ProDOS work and with a very versatile Bit Copy program.

Merlin Pro, a fully featured macro assembler which supports 65C02, 6502, and 65802 usage and which supports relocatable code and a program to derive source code straight from machine language programs!

Ralph Augenfeld

To the reader who discovered the "absolute reset" (Jim S. Hart) on the Laser 128 (COMPUTIST #49), I nominate you for a "Wozzie" (a "Cloney?") award. Not only does the combination of **CM** take you directly from any program into the monitor on ROM version 3.0, but it can bring you back again.

It also can get you out of "frozen" monitor states where normally only a re-boot can release you. Further, if you have a program which is "reset protected" or, in other words, pressing **RESET** does not re-boot or wipe out your memory, you can go from the monitor back to your program where you left off! Go from *Copy II Plus* to the monitor and right back to where you left off with this method! Also, it replaces having to type 3D0G to get back to BASIC, and can be used exactly like an "NMI" card to enter the monitor from protected programs.

backups via Wildcard

Speaking of non-maskable interrupt cards, using my *Wildcard II* I have found quite a few programs that can be backed up and made into a simple self-running DOS (Quick-, of course) disk. Some surprising single load programs include *Where in the World is Carmen Sandiego* (side one, and not "U.S.A."), *EDD IV*, & *Hardball*.

I also back up some DLM software, like

Teddy Bear-rels of Fun, and *Create with Garfield, Deluxe* using the "capture the boot" approach. To do this with these and many other similarly protected programs, boot the original disk to the first menu, and then save the program according to the instructions for your card. Make a self-booting copy of this menu, and then copy the entire original program using any copy utility to the back side of the disk. Now, when you boot the disk and the first menu comes up, flip the disk to the other side, and press **C** or whatever the program asks for to continue.

Normalizing Polarware's Electric Crayon series

Here is a way to make completely normal ProDOS copies of some other children's software, namely Polarware's *Electric Crayon* series.

I received my Sesame Street *Opposites* disk, and much to my chagrin, I could not catalog, copy, bit-copy, or in any way back up this ProDOS 1.1.1 release. Well, after some raspberry yogurt came close to destroying all my daughter's pictures on the master, I realized that children's software must be backed up! When I used the "STOP" command from the pull-down menu, I realized that the normal ProDOS "quit protocol" was intact, as I was presented with the opportunity to specify the prefix and pathname of the next program. Of course, I chose *Copy II Plus* as my prefix, and Util.system as my pathname, and guess what? Now, apparently, since *Copy II Plus* was running under a "modified" ProDOS (a no-no), it cataloged, and copied normally! I formatted a blank disk with the name /OPPOSITES (same as original), copied a new "normal" ProDOS from my *Copy II Plus*, and then copied all the files (except ProDOS, of course) from the original to my new disk.

That's it... a perfect ProDOS copy, ready for RAM card, hard disk, a collection of all these games on a 3.5" disk, etc.

And other notes....

As per my last letter about saving data on the Ramfactor card when the computer is off, Applied Engineering now has replacements for two of its chips on the card which draw less current, and therefore hopefully generate less heat, and run longer from a battery during a power outage. The cost is \$20.00.

Also, *Copy II Plus V.8.0* with the ability to bit copy and sector edit 3.5" disks, sometimes right to a hard disk, and several other new features should be available in late December, 1987, according to Central Point Software. In addition, their new drive controller card is much smaller, draws less current, and seems to run better, as does the new "quiet" version of their 3.5" drive.



Edward Teach

Softkey for...

Walt Disney's Cartoon Maker

Bantam Software

This is a rather cute item that a friend purchased and then could not back up. My first go at inspecting a disk is *Locksmith* fast copy. Even if it does not copy the disk it will show what tracks are protected.

This disk had protection on tracks \$03 and \$11. Also protected was sector \$0F on track \$0D. Using a nibble editor showed track \$03 was sectorless and that track \$11 had the epilogues changed to FF FF.

Using Super IOB I copied track \$11 to my *Locksmithed* copy. The disk still would not catalog. So on track \$11 sector \$00 change byte \$01 from 00 to 11. Writing this to disk will allow a catalog.

Looked good so far, the disk even had a *HELLO* program. Loading the *HELLO* program showed that the next file loaded was *SSPROT\$\$1*.

This program was encrypted and rather hard to decipher. Once run it reads track \$03 and verifies that the original disk is in the drive. Then the program *SSPROT\$\$A* is called. After a dozen or so hours and a few reams of paper, I decided to scan around the disk. Interestingly I came across a one sector program that did not appear in the catalog. It was really nice of the programmer to leave this program on the disk. Once I placed it back in the catalog and ran it, the main program started and worked perfectly.

1 Init both sides of a disk, deleting the *HELLO* programs afterwards

2 BRUN FID, and when prompted for the slot #, press **RESET**.

3 Enter the monitor.

CALL -151
B988:18 60
B925:18 60
803G

4 Now copy all the files except:
SSPROT\$\$1
SSPROT\$\$A
HELLO
CREDIT.CMP

5 Enter the following Hello program and save it on side one of the copy disk.

10 HOME: POKE 34,23
20 PRINT CHR\$(4)"MAXFILES1"
30 PRINT CHR\$(4)"BRUN FUN"
40 END

Side two is copya .. enjoy..

Softkey for...

Disney's Card And Party Shop

Bantam Software

This software is protected almost identically to the *Cartoon Maker* except that Bantam was nice enough to not change the epilogues on track \$11. But, you still have to change track \$11 sector \$00 byte \$01 from 00 to 11, in order to get a catalog.

Now that you have placed the catalog back on the disk, copy all files except the ones listed above. Use the same *HELLO* program except you must change the brun program from *FUN* to *START*.

A.P.T. for...

Card And Party Shop

Bantam

Freedom of speech for Mickey Mouse

Is it possible to have an A.P.T. on a non-game?? Scan through the *Cartoon Maker* program named *FUN* and you will find a list of the 'dirty' words that Minnie and Mickey should never say. In fact the program deletes these words from any text you have typed. I changed all the words to nonsense words, after all if we have freedom of speech in THE COMPUTIST, shouldn't the mice have the same in an unprotected copy?

Carole Fox

French characters and American IIGS Software



Could anyone help me?

I am french and I use IIGS American software like *Multiscribe GS*, *DeLuxe Paint II*, *816 Paint*...

They all use the fonts from */SYSTEM/FONT*. These fonts are international: you can find the characters used in America and Europe.

The list of these languages is given when you choose 'Options - Display language and keyboard layout' from the Control Panel.

Using this 'Option' will give you the French Layout (you will type A instead of Q for instance) but will not give you the foreign characters like é è à ç ...

You will have { instead of é and @ instead of à.

I found out that within the font system, each of these characters has a different ASCII code: 7C for { and 8F for é.

That is where I am stuck. What do I have to look for or what do I have to change in the software that uses the font folder to get French Characters?

A.P.T. for...

Might and Magic

A little help to reach The INNER SANCTUM

■ Requirements

- A sector editor (I used *Copy II Plus*)
- Might and Magic*, side B

Reading "Use your sector editor and become the Master of Shadowkeep's dangers" did ease my conscience. I had been 'visiting' the other side of *Might and Magic* for some time.

Cheating will not make you the master of *Might and Magic* but it sure helps. To reach the Inner Sanctum you will need your wits to solve some puzzles. That is what makes *Might and Magic* such a fascinating game.

What's Where

If you are really stuck use your sector editor and scan the disks for data. (Remember, you will NOT find everything!)

There are four sides:
SIDE A: The boot disk
SIDE B: Characters and towns
SIDE C: Outside
SIDE D: Castles and Caves

How your Merlin or Lancelot becomes Superman!

Use your sector editor to read track \$05, sector \$00 of Side B. You should find the name of your first character. There are approximately 2 characters in each sector.

Follow the table and strengthen your characters. Change the bits according to the table. Don't forget to write the sector back to disk when you are finished with your changes.

All numbers should be written in hexadecimal. Do not rush for your calculator if you possess a IIGS: CALL -151 and type: = followed by your decimal number. The computer will give you the hexadecimal number.

Experience points and gems are back to front. Example: Experience - 216790 points = \$00 22 2B 81 will be written 81 2B 22 00



Readers Data Exchange



Table 1

Byte offset	Description
\$00-0F	Name
\$10	Sex (see Table 2)
\$11-12	Alignment (now-base)
\$13	Race (see Table 2)
\$14	Class (see Table 2)
\$15-16	Intellect (now-base)
\$17-18	Might (now-base)
\$19-1A	Personnality (now-base)
\$1B-1C	Endurance (now-base)
\$1D-1E	Speed (now-base)
\$1F-20	Accuracy (now-base)
\$21-22	Luck (now-base)
\$23-24	Experience level (now-base?)
\$25	Age
\$27-2A	Experience points
\$2B-2C	Spell points (now)
\$2D-2E	Spell points (base)
\$2F-30	Spell level
\$31-33	Gems
\$34-35	Hit points (now)
\$36-37	Hit points (base)
\$39-3B	Gold
\$3C	Attack Class (I think!)
\$3D	Armour Class
\$3E	Food
\$3F	Condition (see Table 2)
\$40-45	Equipment - 6 items
\$46-4B	Back pack - 6 items
\$4C-51	Equipment magic charges
\$52-57	Back pack magic charges
\$58-59	Magic
\$5A-5B	Fire
\$5C-5D	Cold Protection
\$5E-5F	Electricity
\$60-61	Acid percentages
\$62-63	Fear
\$64-65	Poison
\$66-67	Sleep

Table 2

value	SEX
\$01	male
\$02	female
value	ALIGNMENT
\$01	good
\$02	neutral
\$03	evil
value	CLASS
\$01	knight
\$02	paladin
\$03	archer
\$04	cleric
\$05	sorcerer
\$06	robber
value	RACE
\$01	human
\$02	elf
\$03	dwarf
\$04	gnome
\$05	h-orch

value **Condition**
 (the numbers in between give a combination...
 example: \$03)

\$00	GOOD!!
\$01	asleep
\$02	blinded
\$03	asleep,blinded
\$04	silenced
\$08	diseased
\$10	poisoned
\$20	paralysed
\$40	unconscious
\$FF	ERADICATED!!

Somewhere between \$40 and \$FF should be dead and stone!

Table 3 (255 items). List of the best parts.

\$18	flaming club
\$19	club of noise
\$1A	dagger+2
\$1B	hand axe+2
\$1C	spear+2
\$1D	short sword+2
\$1E	mace+2
\$1F	flail+2
\$20	scimitar+2
\$22	battle axe+2
\$23	long sword+2
\$24	royal dagger
\$25	dagger of mind
\$26	diamond dagger
\$27	electric spear
\$28	holy mace
\$29	unholy mace
\$2A	dark flail
\$2B	flail of fear
\$2C	lucky scimitar
\$2D	mace of undead
\$2E	cold axe
\$2F	electric sword
\$30	flaming sword
\$31	sword of might
\$32	sword of speed
\$33	sharp sword
\$34	accurate sword
\$35	sword of magic
\$36	immortal sword
\$37	axe protector
\$38	axe destroyer
\$39	X!XX!X's sword
\$3A	adamantine axe
\$3B	ultimate sword
\$3C	element sword
\$47	magic sling
\$48	cross bow+2
\$49	short bow+2
\$4A	long bow+2
\$4B	cross bow luck
\$4C	cross bow speed
\$4D	lighting bow
\$4E	flaming bow
\$4F	giant bow
\$50	the magic bow
\$6B	staff of light
\$6C	cold glaive
\$6D	curing staff
\$6E	minotaur' axe

\$6F	thunder hammer
\$70	great axe+3
\$71	flamberge+3
\$72	sorcerer staff
\$73	staff of magic
\$74	demon's glaive
\$75	devil's glaive
\$76	the flamberge
\$77	holy flamberge
\$78	evil flamberge
\$8E	ring mail+3
\$8F	chain mail+3
\$90	splint mail+3
\$91	plate mail+3
\$94	blue ring mail
\$95	red chain mail
\$96	X!XX!X'plate
\$97	holy plate
\$98	un-holy plate
\$9A	ultimate plate
\$9B	bracers ac8
SCA	belt of power
\$CB	model boat
\$CC	defense cloak
\$CD	knowledge book
\$CE	ruby idol
\$CF	sorcerer role
\$D0	power gauntlet
\$D1	clerics's beads
\$D2	horn of death
\$D3	potion of life
\$D6	precision ring
\$D7	return scroll
\$D8	teleport helm
\$D9	youth potion
\$DA	bells of time
\$DB	magic oil
\$DC	magic vest
SE1	star saphir
SE2	wealth chest
SE3	gem stack
\$E4	diamond collar
\$E5	fire opal
\$E6	unobtainium
\$E7	vellum scroll
\$E8	ruby whistle
SE9	kings pass
SEA	merchant pass
SEB	crystal key
SEC	coral key
SED	bronze key
SEE	silver key
SEF	gold key
\$F0	diamond key
\$F1	cactus nectar
\$F2	map of desert
\$F3	laser blaster
\$F4	dragon tooth
\$F5	wyvern eye
\$F6	medusa head
\$F7	ring of okrim
\$F8	b queen idol
\$F9	w queen idol
\$FA	pirates map a
\$FB	pirates map b
\$FC	thundranium
\$FD	key card
\$FE	eye of goros



John Thomas

Softkey for...

Creative Contraptions

Bantam Software

Requirements

- Apple II series (with 64K)
- Creative Contraptions* Disk
- Copy II Plus*
- A slave disk initialized by *Diversi-DOS* or other fast-DOS

Background

Creative Contraptions, part of Bantam Software's *Micro-Workshop Series*, will remind you of *Rocky's Boots*. The idea is to build machines to do specific tasks such as wake you up in the morning, walk the dog, beat the heat, or the like, using pulleys, levers, springs, magnets, and assorted animals. The game teaches simple machine principles, cause/effect relationships, and deductive reasoning. Its features make it entertaining to users aged 7 and up—a good reason to deprotect it.

The Protection

Examining the disk with *TRAX* and the *Copy II Plus* Nibble and Sector Editors reveals a normal format with the following exceptions:

Track \$03 on both sides is 'funny.' It vaguely resembles a normal format ('normal' = 16 sectors per track, each composed of sync field, address field, smaller sync field, and data field.) Here, a sync field (FF F7 F6 EF EE) followed by a quasi-address field (AB AB AB FF D5 D5 FF...) recurs at roughly the correct intervals.

Track \$11 on both sides have an abnormal address epilog (D5 AA EB).

The VTOCs (Volume Table of Contents—used by DOS 3.3 to locate files on a disk) on both sides are slightly abnormal.

TRAX reports track \$22, sector \$05 on side 1 as having a 'damaged' data field.

Additionally, a disk check is implemented by the *HELLO* program. After consulting a friend who has some experience with Bantam's protection scheme, I concluded that the above outlined protection is the norm for this company. Further, the softkey presented in this article may be all that's needed to crack Bantam's other (circa 1985) releases.

The Softkey

Some of the protection can be fixed by copying the disk with the *Copy II Plus* DISK COPY utility. This is a sector copier that ignores read errors by producing an empty sector (all zeroes in the data field) on the target disk whenever read errors occur on the source disk. Track \$03 (the 'funny' one) and track \$22 are properly neutralized here, but none of the data on track \$11 is transferred to the copy disk, so certain sectors on this track (both sides) must be ported over individually with the Sector Editor.

Byte \$01 in the VTOC tells DOS which track has the catalog. This byte must be changed from 00 to 11 on each side. The Bantam DOS (tracks \$00—\$02) is replaced with *Diversi-DOS* by using the *Copy II Plus* COPY DOS utility and the *Diversi-DOS* slave disk.

(Create your slave disk by booting any disk with *Diversi-DOS*. Remove it and put a blank disk in the drive. Type *INIT HELLO* and press **[RETURN]**.)

Finally, the disk check is selectively skipped in the boot process by changing the boot program to the file *LOADERBIG*, using yet another *Copy II Plus* utility, *CHANGE BOOT PROGRAM*.

1 Use the DISK COPY utility on *Copy II Plus* to copy both sides of the *Creative Contraptions* disk. Ignore any read errors on tracks \$03, \$11, and \$22 on side 1 and tracks \$03 and \$11 on side 2.

2 Use the *Copy II Plus* Sector Editor to copy side 2, track \$11, sectors \$0F, \$0E, and \$0D (the only catalog sectors used on this side) from the original to the copy disk. Here's how:

- a. Get to the Sector Editor and put the original disk in the selected drive.
- b. Press **[P]** to PATCH READ/WRITE.
- c. Use arrows keys and **[RETURN]** to select CUSTOM.
- d. Press **[RETURN]** 3 times to get ready to change WANTED EPILOG.
- e. Type **D5**. This is the first byte of track \$11's address epilog.
- f. Press **[ESC]** twice. This is all the patching that's needed.
- g. With the original in the drive, press **[R]** (for READ), then type **11** and press **[RETURN]**, then type **F** and press **[RETURN]**. This directs the Sector Editor to read sector \$0F on track \$11 of the original disk.
- h. Remove the original disk from the disk drive and replace it with the copy disk. Press **[W]** (for WRITE) and press **[RETURN]** twice. This tells the Sector Editor to write the sector back to the copy disk, replacing the empty sector on the copy.
 - i. Repeat steps **g** and **h** on sectors \$0E and \$0D.

3 Put the original back in the drive and read sector \$00 from the same track, same side, and change byte \$01 from 00 to 11 before writing the sector back to the copy disk.

Here's how

- a. Read track \$11, sector \$00 of the original disk (as in sub-step a above).
- b. Press **[K]**. This moves the cursor to the right one position to byte \$01. Cursor movement is affected with the **[I]** **[J]** **[K]** and **[M]** keys. (A weakness of the Sector Editor, I feel—the arrow keys should move the cursor!)
- c. Press **[H]**. This selects the ENTER HEX VALUES option.
- d. Type **11** and press **[RETURN]**. Press **[ESC]**. This changes the value of byte \$01 from \$00 to \$11.
- e. Switch disks and write the sector back out as in step **h** above.

4 Repeat the same procedures on side 1 as given in steps 2 and 3. Side 1 needs catalog sectors \$0F, \$0E, \$0D, and \$0C, so you'll be copying 4 catalog sectors as well as copying and changing the VTOC (sector \$00) this time.

5 Use the *Copy II Plus* utility, *COPY DOS* to copy the DOS from the *Diversi-DOS* slave disk to the copy disk.

6 Use the *Copy II Plus* utility, *CHANGE BOOT PROGRAM* to select the file *LOADERBIG* as the boot program.

Enjoy your *COPYA*-able copy of *Creative Contraptions*.

Softkey for...

Combining the Elements

D.C. Heath and Co

Requirements

- Apple II+, IIe, IIc (64K)
- Combining The Elements* disk
- Copy II Plus* version 6.0 or later
- BASIC.SYSTEM* found on *ProDOS USERS.DISK*

Background

D.C. Heath has published an engaging group of software packages that may be used to teach the concepts of the physical sciences to Middle School and Junior High School students. *Combining the Elements* (CTE) introduces the periodic table, atomic structure, and chemical bonding. A student's work may be saved on the disk and thus developed over multiple sessions. Repeated disk access by the CTE disk (and the lone backup provided by Heath) and a disk check routine make it difficult to share among a larger group of students.



The protection used on the disk includes, along with the disk check, one track that has a funny format to foil COPYA and bit copiers and probably as the object of the disk check.

Track \$19 has one huge sync field with a single string of non-sync bytes in the middle of the field that read: BF CF F3 FC. The bytes outside of this sync field are all FFs, so no program data is lost by using a sector copier that can ignore errors to 'clean' this track up.

The rest of the disk is perfectly normal of format.

After copying the disk with *Copy II Plus*, I printed its catalog with file lengths (again with *Copy II Plus*). This revealed an ordinary-looking set of ProDOS files.

The file ProDOS appears first, followed by some picture files and a file called MOLE.SYSTEM which, as I discovered, included the main program and the disk check.

The other files are binary and contain data that the program uses.

When I tried to boot my new copy disk, ProDOS loaded itself in, then there were a few seconds of disk access.

After a split-second pause, first drive 1 came on, then drive 2, then the screen cleared and a BASIC prompt and cursor appeared.

A quick call to the Monitor showed that RAM from the end of the text screen (\$07FF) to \$BFFF had been cleared as well.

A disk check routine seemed to be taking control of things.

ProDOS-based disk check routines in my experience have used either direct disk access (search the disk and/or memory for LDA \$C08C.X), or calls to ProDOS' Machine Language Interface (search for JSR \$BF00). I used *Copy II Plus*' sector editor to search the disk for clues to direct access first (8C C0).

The ProDOS Bootstrap Loader on track \$0, and ProDOS itself, on track \$4, directly access the disk drive controller card. Closer inspection of this code revealed nothing out of the ordinary. In searching for calls to the MLI (20 00 BF), again I found only the ordinary ones that ProDOS itself makes.

The source code of calls to the MLI always take the form:

```
JSR $BF00      Jump to MLI call handler
DFB function code Over 20 functions
DA  addr parm list Each function has its
                   own parameter list
```

As ProDOS processes these calls, it digs out of the stack the return from subroutine address, then adds \$03 to it in order to skip over the function code and parameter list address bytes so it can return to an executable instruction when the call is done. The function code tells ProDOS which device-independent function is to be performed.

('Device-independent' means the programmer does not have to be concerned with

slot or drive number, or even what kind of disk drive.)

The parameter list holds such information as the pathname and address of a data buffer. For our purposes, the most important thing is the function code, a very specific indicator of what ProDOS is up to as a program calls it for file or block-level access.

Next, I booted my ProDOS Users disk. This puts ProDOS and BASIC.SYSTEM (the BASIC interface) in place.

ProDOS SPY

I then ran a nifty utility called *ProDOS SPY* by Ken Manly. I found it in the February 87 issue of *Nibble* (of all places!) It works like *PROSHADOW*, but additionally supplies the MLI function name (and filename if accessing a file.)

I turned on my printer and ran *MOLE.SYSTEM*. I sat fascinated as the SPY program traced ProDOS' search for the file, opening and reading it, and finally grinding to a halt as it tried to 'READ BLK' (read block) number \$C0 into memory beginning at \$0800, first from drive 1, then from drive 2. Here was the disk check routine, caught in the act!

Further study of the output from my printer and *ProDOS SPY* revealed that no other file but *MOLE.SYSTEM* had been accessed.

MOLE.SYSTEM (good name for the varmint at this point) must have been using a self-modifying routine to READ the Block. The next step was to trace the file itself.

It loads in at \$2000 as most ProDOS TYPE: SYS files do. The first instruction there is a JMP to \$8031.

```
8031 LSR $03F4 Scramble power-up byte
8034 JSR $803A Build disk check code at
                    $1DC5
8037 JMP $1DC5 Do disk check
803A LDX #560 The code from here
803C BEQ $8046 to $8059 builds the
803E LDY #5FF disk check routine
8040 JSR $8048
...
8059 RTS

The instruction at $8031 forces reboot upon
pressing [RESET]. Using code from pages
$30 through $46 as a seed, the disk check code
builder at $803A leaves the following code at
$1DC5:

1DC5- 4E C8 1D LSR $1DC8
1DC8- DC      ???
1DC9- CE 1D 6E DEC $6E1D
1DCC- D0 1D BNE $1DEB
1DCE- 40     RTI
1DCF- C9 3E CMP #53E
...
```

This code doesn't make much sense upon first inspection. It's sprinkled with ???s and references to obscure addresses. Tracing the

code, that is, executing the code on paper reveals how the code rebuilds itself. The LSR instruction at \$1DC5 modifies the byte immediately following it at \$1DC8. This byte will now contain an ROR instruction which further modifies another, and so on. After running it, the above code now becomes:

```
Shift bits right at $1DC8
1DC5- 4E C8 1D LSR $1DC8
Rotate bits right at $1DC8
1DC8- 6E CE 1D ROR $1DC8
Rotate bits right at $1DD0
1DCB- 6E D0 1D ROR $1DD0
Set up some of the exit code
1DCE- 20 C9 1F JSR $1FC9
...
```

These instructions ultimately build the way out at \$1E0B...

```
Exit happily
1E0B- 4C 84 1F JMP $1F84
```

And the disk checking JSR to the MLI at \$1E24.

```
Call MLI
1E24- 20 00 BF JSR $BF00
Function code for READ BLK: $80
1E27- 80      ???
Address of parm list: $1E16
1E28- 16 1E ASL $1E.X
On error, A-register holds error code,
with carry flag set
1E2A- F0 02 BNE $1E2E
...
```

This is the call that *ProDOS SPY* caught turning on my disk drives trying to read block \$C0 into page \$08. With all this code in place, I found that typing **1F84G** from the Monitor with my copy disk in the drive started up the program nicely.

The Softkey

The deprotection of CTE involves copying the original, renaming *MOLE.SYSTEM*, and adding *BASIC.SYSTEM* to the copy. Here's why: This will leave you in BASIC's immediate mode when the disk is booted. As bootable ProDOS disks boot, the Bootstrap loader loads and executes the file ProDOS. When ProDOS is up and running, it checks the disk for the first file in the volume directory which both has .SYSTEM as the last 7 characters of its filename, and is a System file (type: SYS). Here, we want *BASIC.SYSTEM* to be that file, not *MOLE.SYSTEM*. Next, boot the copy disk and **BLOAD** and execute *MOLE.SYSTEM* to the point of the disk check. Then interrupt and resave *MOLE.SYSTEM* so it begins at the point where the phantom disk check routine exits. When it's ready, **DELETE** this file from disk and **BSAVE** it as a BINARY file in its modified form. All that's needed then is to add a short *STARTUP* program to the disk which will run the modified *MOLE.SYSTEM*.



1 Use *Copy II Plus'* **DISK COPY** to copy the *CTE* disk. Ignore the read error on track \$19.

2 Use *Copy II Plus'* **COPY FILES** to put a copy of *BASIC.SYSTEM* on the new copy disk.

3 Use *Copy II Plus* to **RENAME** the file *MOLE.SYSTEM* on the new copy disk to *MOLE.SYS* so that ProDOS will run *BASIC.SYSTEM* upon booting.

4 Insert the new copy disk in your boot drive and boot it.

5 **BLOAD** the system file *MOLE.SYS*, and get into the Monitor.

**BLOAD MOLE.SYS, TSYS, A\$2000
CALL-151**

6 You're going to need **RESET** to interrupt the program after it builds the necessary code, so bypass the LSR \$03F4 instruction at \$8031 with the command **8034G**.

This starts the program running and building the disk check code at \$1DC5, but be ready to hit **RESET** a split second later as soon as the light on the disk drive comes on. Timing is important.

**8034G
RESET**

7 Get into the Monitor again and check to see that the needed code is intact.

**CALL-151
1F84L**

You should see...

1F84- 20 BD 1F JSR \$1F8D
1F87- 20 A7 1F JSR \$1FA7
1F8A- 4C 00 20 JMP \$2000

8 Get back to BASIC and use *BASIC.SYSTEM* to delete *MOLE.SYS* and save a new, modified version of the file.

**3D0G
DELETE MOLE.SYS
BSAVE MOLE.SYS, A\$1F84, E\$805A**

9 Reset BASIC pointers and enter and save a short BASIC program as a *STARTUP* file.

**NEW
10 REM STARTUP BY J. THOMAS
20 PRINT CHR\$(4) "MOLE.SYS"
SAVE STARTUP**

That's it!

David G Alexander

The present softkey is incomplete due to employment-related, time constraints which

forced me to put the project on hold for the time being. However, I thought that the results of my analysis thus far might be of interest to other COMPUTIST readers and possibly generate some feedback.

† *Softkey for...*

Carriers at War

Strategic Studies Group 1984

The game is a simulation of World War II fleet carrier operations in the Pacific which is played on a honeycomb shaped grid.

The disk can be easily backed up using *Copy II Plus* bitcopy system or the like.

The protection comprises a "Customized Disk Operating System" by Keating Computer Services P/L. There does not appear to be any secondary protection such as a nibble count.

The customized operating system appears to rely heavily on concepts from the stone age which were probably rejected by Woz at an early stage in the development of the Disk II system.

More specifically, each track on the disk comprises 10 sectors, each having a data field of 512 bytes which is 4-by-4 encoded using the same scheme as the address field.

The address headers are D5 AA B5, reminiscent of DOS 3.2.

There does not appear to be a file structure per se. Instead, various blocks of data which may be considered to constitute "pseudo files" are mapped to specific sectors on the disk and read/written directly by specifying the track and sector numbers.

A sector read routine is found on track \$00, sector \$00 (the boot sector) which is readable by the disk controller card and converts each consecutive two bytes of data on the disk to one byte in memory using the shift, mask and combine technique which is conventionally employed for reading address fields.

A clone of this routine is found in the main DOS at \$BE8D-\$BEFE. A block of data or pseudo file is read/written in integral numbers of consecutive sectors/memory pages through a JSR to a vector at \$3D0 which holds a JMP instruction to \$BD00. Prior to the jump the parameters for disk access are stored in memory locations \$00-\$05 as follows.

\$00 = first memory page
\$01 = last memory page
\$02 = ?
\$03 = command code
0 = seek
1 = read
2 = write
7A = init
\$04 = starting track
\$05 = starting sector

For example, a representative set of parameters stored at \$8A93 are 40 57 00 01 02 00 which correspond to "read a block of consecutive sectors starting at track \$02, sector \$00 into consecutive memory pages \$40-\$57".

The routine for copying the parameters from page \$8A to page \$00 and then jumping to the disk access vector at \$3D0 starts at \$8AD1 and disassembles as follows.

```
8AD1 LDX #500
8AD3 LDA $8A93, Y
8AD6 STA $00, X
8AD8 INY
8AD9 INX
8ADA CPX #506
8ADC BCC 8AD3
8ADE JSR $03D0
```

The obvious method for converting the disk to 16-sector, 6-by-2 encoded format would be to plug the alien read routine into the DOS 3.3 RTWS, disconnect the postnibble routine, and use the resulting modified RWTS in the *Super IOB* swap controller. I tried that, but must have missed some details because the controller would not read the disk.

I therefore resorted to the expedient of reading blocks of data from disk to memory using the *Carriers'* DOS and writing them back to a DOS 3.3 disk using SREAD/SWRITE and an Applesoft controller.

Capturing the main program and saving it to a DOS 3.3 disk in bootable form using a copy card such as *Wildcard II* or a manual procedure poses no particular problem. However, the *Carriers'* DOS is incapable of reading DOS 3.3 because it lacks prenibble and postnibble routines.

There would appear to be two alternatives in converting *Carriers* to the DOS 3.3 environment. The first would be to rewrite the *Carriers'* DOS so that it would read and write to 6-by-2 encoded sectors. The second would be to map the pseudo files which are read by the program as blocks of sectors, convert them to DOS 3.3 binary files and change the disk access commands from the parameter setup and jump to the \$3D0 vector to BLOAD and BSAVE commands.

Steve Charles

Softkey for...

Tomahawk

Datasoft

Requirements

- Sector editor/disk scanner
- Blank disk



I recently purchased *Tomahawk*, a new helicopter simulator from Datasoft.

Because the original disk isn't write-protected (invitation to disaster), I made a backup copy of it. Although it copied without any errors, upon booting it just hung up and displayed "Please use original disk".

Why is this (and other simulators) protected? The instruction manuals are a necessity for these complex programs. Anyone receiving a copy of these type of programs won't be able to use them anyway, and they may become interested enough to go out and buy an original. End of digression.

Searching thru memory yielded the 'Bad Disk' code routine at \$ 4563.

Looking further, I found a nibble count in the high end of page \$44. Sure enough, in the middle of the nibble count (at \$44CB) was a jump to \$4563, preceded by a RTS instruction (Return From Subroutine). I replaced the first byte of the jump (4C) with a RTS (60) and restarted the program.

Success! Now I had to change the code on the disk. With a disk scanner (I use *Copy II Plus*), I searched for the instruction to be replaced, 4C 63 45.

No luck - Datasoft had encoded the data on the disk. Time to boot trace!

To my surprise, even the boot sector (track \$00, sector \$00) was encoded. Looking at the first instruction, the code jumped to the end of the sector, where there was a simple decryption routine for that page.

On the chance that the same routine might be also used for the rest of the disk, I encoded 4C 63 45 with it to get 98 C6 8A. Scanning the disk for these bytes, I found a match at track \$00, sector \$05, byte \$CB. Replacing the first byte with an encoded RTS (C0), I rebooted the disk. Finally, success!

1 Make a copy of *Tomahawk* with any normal copier.

2 Make the following sector edit :

Trk	Sct	Byte(s)	From	To
\$00	\$05	\$CB	\$98	\$C0

If the code is moved elsewhere on your disk, scan for 98 C6 8A and replace the 98 with a C0.

Jack R. Nissel

Here are some softkeys that have worked for me.

Softkey for...

Beach-head II

Access

1 Boot your DOS 3.3 system disk.

2 Tell DOS to ignore checksum and epilogues and run *COPYA*.

POKE 47426,24
RUN COPYA

3 Make the following sector edits to the copy you just made.

Trk	Sct	Byte(s)	From	To
\$00	\$02	\$72-77	60 EA EA EA EA EA	A9 E4 8D 26 40 60

4 Write the sector back to the disk.

Softkey for...

Championship Boxing

Sierra On-Line

1 Boot your DOS 3.3 system disk.

2 Tell DOS to ignore checksum and epilogues and run *COPYA*.

POKE 47426,24
RUN COPYA

3 Make the following sector edits to the copy you just made.

Trk	Sct	Byte(s)	From	To
\$18	\$07	\$68	D0 0D EA EA	EA EA 0D D0

4 Write the sector back to the disk.

Softkey for...

Championship Wrestling

Epyx

1 Boot your DOS 3.3 system disk.

2 Tell DOS to ignore checksum and epilogues and run *COPYA*.

POKE 47426,24
RUN COPYA

3 Make the following sector edits to the copy you just made.

Trk	Sct	Byte(s)	From	To
\$00	\$05	\$7C-7D	A5 F4	A9 E7
		\$93-95	6C FC FF	4C 7A BB

4 Write the sector back to the disk.

Softkey for...

Chessmaster 2000

Software Toolworks

1 Boot your DOS 3.3 system disk.

2 Tell DOS to ignore checksum and epilogues and run *COPYA*.

POKE 47426,24
RUN COPYA

3 Make the following sector edits to the copy you just made.

4 That's it.

Softkey for...

Commando

Data East

1 Boot your DOS 3.3 system disk.

2 Tell DOS to ignore checksum and epilogues and run *COPYA*.

POKE 47426,24
RUN COPYA

3 Make the following sector edits to the copy you just made.

Trk	Sct	Byte(s)	From	To
\$00	\$06	\$00-01	A0 00	18 60

4 Write the sectors back to the disk.

Softkey for...

Fat City

Optimum Resource

1 Use any fast copy program that can ignore errors.

2 Copy disk and ignore a read error on track \$01.

3 Make the following sector edits to the copy you just made.

Trk	Sct	Byte(s)	From	To
\$02	\$06	\$00-02	A0 3C FB	18 60 F7

4 Write the sector back to the disk.

Softkey for...

Fight Night

Accolade

The softkey shown in COMPUTIST #46 would not work on my copy because none of the bytes were the same. For those of you who had the same problem, this simple softkey should work.

1 Use any fast copy program that can ignore errors.

2 Copy disk and ignore a read error on track 22.



3 Make the following sector edit to the copy you just made.

Trk	Sct	Byte(s)	From	To
\$0E	\$00	\$2E	F0	D0

6 Write the sector back to the disk.

Softkey for...

Intrigue

Spectrum Holobyte

1 Boot your DOS 3.3 system disk.

2 Change DOS and Run *COPYA*.

CALL-151

B954:4A C9 6A D0 EF

B98B:18 60

RUN COPYA

That's it.

Softkey for...

Pitstop II

Epyx

1 Boot your DOS 3.3 system disk.

2 Tell DOS to ignore checksum and epilogues and run *COPYA*.

POKE 47426,24

RUN COPYA

3 Boot your DOS 3.3 system disk again.

4 BRUN MASTER CREATE

5 Specify [*BOOT*] as the greeting program name and copy DOS to your new *Pitstop II* disk.

6 Make the following sector edit to the copy you just made.

Trk	Sct	Byte(s)	From	To
\$00	\$05	\$42	\$06	\$34

7 Write the sector back to the disk.

Softkey for...

Jungle Hunt

Atarisoft

1 Boot your DOS 3.3 system disk.

2 Tell DOS to ignore checksum and epilogues and run *COPYA*.

POKE 47426,24

RUN COPYA

3 Boot your DOS 3.3 system disk again.

4 BRUN MASTER CREATE

5 Specify [*A*] as the Hello program name and copy DOS to your new *Jungle Hunt* disk.

6 Make the following sector edit to the copy you just made.

Trk	Sct	Byte(s)	From	To
\$00	\$0D	\$42	06	32

7 Write the sector back to the disk.

Copy II Plus softkey for...

Print Shop Graphics Library Holiday

Broderbund

If you make a copy using *Copy II Plus v7.4* the copy will be deprotected.

† *Softkey for...*

World's Greatest Baseball Game

Epyx

The softkey shown in *COMPUTIST #48* worked on side 1, disk A of my copy, but in order to get side 2 to work I did the following in addition to that softkey.

1 Copy normal DOS to side 2 disk A of the copy you made.

2 Boot DOS 3.3 system disk.

3 Put in copy so you can write to side 2 then type:

NEW

10 D\$ = CHR\$(4)

20 PRINT D\$'RUN TRADING PROGRAM'

SAVE HELLO

Softkey for...

Centipede

Atarisoft

1 Boot your DOS 3.3 system disk.

2 Type:

CALL-151

B928:18 60

B988:18 60

RUN COPYA

3 Make the following sector edits to the copy you just made.

Trk	Sct	Byte(s)	From	To
\$00	\$03	\$35	AA	DE
		\$3F	DE	AA
		\$91	AA	DE
		\$9B	DE	AA

4 Write the sector back to the disk.

Softkey for...

Stargate

Atarisoft

1 Boot your DOS 3.3 system disk.

2 Type:

CALL-151

B928:18 60

B988:18 60

RUN COPYA

3 Make the following sector edits to the copy you just made.

Trk	Sct	Byte(s)	From	To
\$00	\$03	\$35	AA	DE
		\$3F	DE	AA
		\$91	AA	DE
		\$9B	DE	AA

4 Write the sector back to the disk.

Softkey for...

Movie Maker

Electronic Arts

1 Use any fast copy program that can ignore errors.

2 Copy all four sides of the original disks and ignore a read error on track \$06 of disk 1, side A.

3 Scan disk 1, side A for the byte string 4C 69 A0 and change them to 18 60 DD. The byte string may be found several times so scan the whole side of the disk and replace the string each time it is found.

4 Don't forget to write the sectors back to the disk.

Softkey for...

Make Your Own Murder Party

Electronic Arts

1 Use any fast copy program that can ignore errors.

2 Copy both sides of the original disk and ignore a read error on track \$06 of side A

3 Scan side A for the byte string 4C 69 A0 and change them to 18 60 DD. The byte string may be found several times so scan the whole side of the disk and replace the string each time it is found.



4 Don't forget to write the sectors back to the disk.

Softkey for...

Manic Mansion

Lucasfilm Games

This title is distributed by Activision and uses the same protection as do several other recent Activision releases.

1 Use any fast copy program to copy both sides of the disk.

2 Using your sector editor search side 1 for the string that begins A9 56 85.

3 Look ahead until you find the string 38 2A 25 FC.

4 Starting with the byte with the value A9 that you found in step 2, change all the bytes to EA up to, but not including the bytes with the value 25 FC that you found in step 3.

5 Change the 25 FC to A9 FF.

6 Write the sector back to the disk.

Softkey for...

Kung-fu Master

Data East

1 Boot your DOS 3.3 system disk.

2 Tell DOS to ignore checksum and epilogues and run *COPYA*.

POKE 47426,24

RUN COPYA

3 Make the following sector edits to the copy you just made.

Trk	Sct	Byte(s)	From	To
\$00	\$05	\$00-01	A0 00	18 60

4 Write the sector back to the disk.

Softkey for...

Spy vs. Spy volume I & 2

Avantage

This title is distributed by Acclode and uses a protection scheme somewhat like recent Activision releases.

1 Use any fast copy program to copy both sides of the disk.

2 Using your sector editor search side 1 for the string that begins A9 56 85.

3 Look ahead until you find the string 38 2A 25 00.

4 Starting with the byte with the value

A9 that you found in step 2, change all the bytes to EA up to, but not including the bytes with the value 25 00 that you found in step 3.

5 Change the 25 00 to A9 FF.

6 Write the sector back to the disk.

Softkey for...

Sorcerer

Infocom

1 Boot your DOS 3.3 system disk.

2 Type:

CALL-151

B925:18 60

B988:18 60

BE48:18

B8FB:29 00

RUN COPYA

3 Make the following sector edits to the copy you just made.

Trk	Sct	Byte(s)	From	To
\$00	\$02	\$5D	BC	AD
		\$FB-FC	C9 BC	29 00

4 Write the sector back to the disk.

Softkey for...

Zork III

Infocom

1 Boot your DOS 3.3 system disk.

2 Type:

CALL-151

B925:18 60

B988:18 60

BE48:18

B8FB:29 00

RUN COPYA

5 Make the following sector edits to the copy you just made.

Trk	Sct	Byte(s)	From	To
\$00	\$02	\$5D	BC	AD
		\$FB-FC	C9 BC	29 00

6 Write the sectors back to the disk.

Softkey for...

Battle Cruiser

Strategic Simulations

I didn't do this next softkey myself, but I'm told that it will work.

1 Boot your DOS 3.3 system disk.

2 Type:

CALL-151

B942:18

B957:00

RUN COPYA

3 That's it.

Softkey for...

House-on-a-disk

Activision

1 Use any fast copy program to copy both sides of the disk.

2 Using your sector editor search side 1 for the string that begins A9 56 85.

3 Look ahead until you find the string 38 2A 25 FC.

4 Starting with the byte with the value A9 that you found in step 2, change all the bytes to EA up to, but not including the bytes with the value 25 FC that you found in step 3.

5 Change the 25 FC to A9 FF.

6 Write the sector back to the disk.

Something interesting...

Here is something that I found out that you might find interesting and useful.

On Side 1, track \$11, sector \$01, bytes \$00-08 is where the information is stored for the character.

If you have not yet written to side 2, (make several copies of side 2 before you write to them), changing the value of bytes \$00-08 will produce a different little computer person. He will look basically the same, but he will have a different name, he also may have different color hair, or some type of hat on, etc.

You must start each byte with the number 3, (example 31, 33, 36, etc.).

† *Correction to the softkey for...*

Temple Of Apshai Trilogy

Epyx

My softkey in issue COMPUTIST #48 was not complete. The softkey shown will only work if you first copy your original disk using the *Copy II Plus v7.4* parms and then using the copy you made as the disk you copy from using *COPYA* as shown in the softkey.

† *A problem with the softkey for...*

Crisis Mountain

Microlab

None of the COMPUTIST softkeys had



worked for my copy of *Crisis Mountain*.

Ⓢ When I figured out a softkey that seemed to work, (the same softkey shown in COMPUTIST #50 sent in by The Hacksaw), I found out that although you could now disk copy it, once you saved a high score to it the disk would not boot again.

If anyone has a fix for this please send it in.

† Partial softkey for...

Stellar 7
Penguin

The softkey for *The Quest* shown in COMPUTIST #41 will deprotect this title except for the same problem as in *Crisis Mountain*: Once you save a high score the disk will not boot again.

Ⓢ Can anyone tell me where the high scores are stored for the following:

1. *Swashbuckler* by Datamost
2. *Situation Critical* by Prism Software
3. *Cavern Creatures* by Datamost
4. *BC's Quest for Tires* by Sierra On-Line

It would be helpful if when you sent in softkeys you showed the name of the company who put out the title that the softkey is for since the same title may have been put out by several different companies at different times.

As to allowing people to send in softkeys for other computers. I am totally against it!!! If there was a large demand for this there would be at least one magazine now publishing to meet this demand, I don't believe there is any, and this tells me that there is not enough demand to support such a magazine.

However the demand for the deprotection of Apple software has supported COMPUTIST for the past 6 years and I feel it would be a disservice and a slap in the face to the many people who have supported it, to lose any space to non-Apple software.

I realize that some of these titles are old and other softkeys for them may have been mentioned in the very early issues of COMPUTIST, but as someone who has, within the last year, gotten into computing I know that there are other new computer users and new readers of COMPUTIST who may benefit from them.

Bob Colbert

A.P.T. for...

Wizardry IV
Sir Tech

Wizardry IV Codes

Wizardry IV gives you three 4-digit numbers and prompts you for the fourth. Using this table, you can quickly and easily derive the fourth code.

First look up the three numbers in the left half of each of the three columns.

Next write down the three corresponding codes from the right half of each of the three columns.

Now add up the numbers. If number is 5 digits, subtract 9000, and repeat subtraction until number is 4 digits.

Example: Given 2338 1753 2451. Looking at the table, the corresponding number to 2338 is 6375. Write this down. Repeating this with the other two four-digit codes, you get 6704 and 8981. The sum of 6375, 6704, and 8981 is 22,060. Now subtract 9000 from this and you get 13,060. Again subtract 9000 and you have 4060.

Authorization codes

Code #1	Code #2	Code #3
1080-8771	1086-0000	1193-0000
1211-1280	1219-1488	1282-8510
1386-6528	1516-7814	1529-9475
1556-8090	1588-9399	1602-1451
1607-9125	1669-1330	1712-9012
1735-8696	1753-6704	1757-8556
2138-4261	2194-9354	2219-8449
2293-1026	2301-7565	2313-9190
2338-6375	2362-3161	2377-8896
2395-6353	2437-6150	2451-8981
2470-3160	2480-2293	2770-8866
2788-2544	2800-1764	2812-9871
2892-5107	2897-4925	2910-1315
2919-3105	2922-3479	2941-1190
2990-1102	3014-5023	3032-8839
3137-3205	3243-8265	3278-9832
3303-6727	3369-7684	3414-9682
3463-4306	3538-7509	3547-1065
3587-7452	3779-6269	3816-1374
3852-4943	3868-3350	3996-9299

Christopher Dean

† Softkey for...

Jet
Sublogic

This letter is to inform COMPUTIST readers that *Jet* by Sublogic can be deprotected by using the *Flight Simulator* softkey in COMPUTIST #36 with just a few modifications.

The disk format is the same, and the DOS is the same, the only differences being that *Jet* does not have any 'language card data' (even though it has a load routine in DOS for one) or any write routines.

The following procedure will enable one to deprotect *Jet* with the *Flight Simulator* softkey.

A The first step is to follow the *Flight Simulator* softkey up to step six. At step six replace with the following steps:

1D3E:4C 59 FF
1D03G

B Now insert the work disk with the *Flight Simulator* programs.

C600G
BSAVE JETBOOT2,A\$1D00,L\$300
BSAVE JETDOS,A\$2000,L\$600

C Next, make the following changes to *Flight Simulator's* programs:

CALL-151
BLOAD COPY
103B:FC
1060:AF
1063:4F
BSAVE JETCOPY,A\$1000,L\$C7
BLOAD DDS LOADER,A\$1F09
1F38:3C
BSAVE JETDOS LOADER,A\$1F09,L\$54
BLOAD NEWDOS, A\$2154
216D:81 21
2172:C7 21
21BB:2B 22
BSAVE NEW JETDOS,A\$2154,L\$E7

D Finally, follow the rest of the *Flight Simulator* softkey excluding the DOS memory wipes (to clean up the code), the write routines, and any procedures relating to language card data (including the sector edits), in other words, all that has to be done is copy *JET* with *JETCOPY*, *JETDOS*, and *JETBOOT2*, then write the *Jet* programs and *BOOT1* to track \$00 in the same manner listed in the *Flight Simulator* softkey.

Nicholas Siamson

Here are softkeys for *Manic Mansion* and *Aliens*. Both Activision programs can be copied with *COPYA*. The protection is similar to the protection used on *Spindizzy* in COMPUTIST #48, p.21.

Softkey for...

Manic Mansion
Activision



1 Copy both sides of *Manic Mansion* with *COPYA*.

2 Use your sector-editor and make the following changes on side 1 of the disk:

Trk	Sct	Byte(s)	From	To
\$00	\$0C	\$56-95	A9...2A	all EAs
		\$96-96	25 FC	A9 FF

Softkey for...

Aliens

Activision

1 Copy both sides of *Aliens* with *COPYA*.

2 Use your sector-editor and make the following changes on side one of the disk:

Trk	Sct	Byte(s)	From	To
\$0B	\$0E	\$5B-9A	A9...2A	all EAs
		\$9B-9C	25 FC	A9 FF

Dennis Gaunt

Softkey for...

Bridge 4.0

Artworx

Bridge 4.0, a mediocre bridge program by Artworx is easily deprotected by using the softkey given for *Computerbridge* in *COMPUTIST* #44. It consists of:

RUN COPYA

[C]

70

CALL-151

B942:18

3D0G

RUN

Trk	Sct	Byte(s)	From	To
\$00	\$03	\$91	DF	DE

Copy II Plus softkey for...

Pinball Construction Set

My version of *Pinball Construction Set* resisted all of my attempts at deprotection. Since I didn't have a softkey specifically for this program in my back issues of *COMPUTIST*, I used the *Copy II Plus v7.1* to do it. This disk has 3 parameters for *Pinball Construction Set* (Alt.). The parameters, which are entered in the Create A Parameter option, are:

T0-T4, Sector Copy

Sector Edit, Track 3, Sector 06, DOS 3.3, 4A:

EA/EA/EA

T7-T22, Sector Copy

The subsequent copy gives a read error on track \$06 but this doesn't matter.

R. Bendel

† Softkey for...

Wings Of Fury

Broderbund

I received a copy of *Wings of Fury* and the first thing I did was to check out any other wares that Broderbund just put out.

Hey, look at this: Eric Taylor's softkey for *Bank Street Writer 3* in *COMPUTIST* #47.

My crack is to use *Locksmith* to bit-copy \$00-22 both sides, then boot up your *Copy II Plus v5.2* (old). DOS patch 3.3 and read track \$00 sector \$0B and type in Table 1 of the *Bank Street Writer 3* softkey. Write it back to the disk only on side A. Then make your drive busy....

P.S. It was made in Lacrosse and it was cracked in Lacrosse.

Mark G. Prestero

† Softkey addendum for...

Bag Of Tricks

Quality Software

I recently tried to use the softkey given the *Book Of Softkeys* volume I for Quality Software's *Bag Of Tricks* with no success at getting the programs to perform disk operations properly.

After considerable experimenting, I was able to determine that my version of the program had, in the *SUPPLEMENT* program, code which sent the program to page \$9B for DOS entry. This caused the program to crash. With the help of the *Locksmith* Automatic Boot Tracer, I found the area which caused the problem, made a change to send the program to the correct DOS location and have had no problems with any of the unprotected *Bag Of Tricks* programs.

The change I made should be added to step 18 is:

5553:B7

End

MOST WANTED Softkeys

- ABM Muse
- Accolade Comics Accolade
- Agent U.S.A. Scholastic
- Airheart Broderbund
- Algebra I Davidson & Associates
- Algebra I Intelligent Tutor
- Apple Super Pilot Apple
- Ballblazer Epyx
- Balance of Power Mindscape
- Bandits Sirius Software
- Bank Street Filer Broderbund
- Brain Bank The Observatory
- Captain Goodnight Broderbund
- Car Builder Optium Resource
- Championship Baseball Activision
- Colossus IV Firebird
- Create with Garfield DLM
- Cross Clues Science Research
- Crossword Magic Mindscape
- Crypt of Media Sir Tech
- DB Master V4.0 Stoneware
- Deep Space Sir Tech
- Earth Orbiting Station (EOS) Electronic Art
- Fay: The Masked Woman Digitech Software
- Fay's Word Rally Digitech Software
- Fay: Word Hunter Digitech Software
- Fun Bunch Unicorn
- Gemstone Healer SSI
- GoldFinger Mindscape
- Goonies Datasoft
- GradeBusters 1-2-3 Gradebusters
- Gutenberg Jr. & Sr. Micromation LTD
- Handicapping System Sports Judge
- Hardball II (gs) Accolade
- J & S Grade Book J & S Software
- Jigsaw Microfun
- Le Francais Par Ordinateur D.C. Heath & Co
- Legacy of the Ancients Electronic Arts
- Marble Madness (IIgs) Electronic Arts
- Mathblaster Davidson & Associates
- Microzine 22 & 23 Scholastic Software
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- Movie Monster Game Epyx
- Odin Odesta
- Operation Frog Scholastic Software
- Peeping Tom Microlab
- Personal Finance Manager Apple Computer
- Prime Plotter Primesoft Corp.
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43	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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34	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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32	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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26	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
★ 23	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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★ 7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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3 •Softkeys: •Bag of Tricks •Multiplan •Readers' Softkeys: •Visiplot /Visitrend •Sneakers •Wizardry •Features •No More Bugs: The Sequel •Hidden Locations Revealed •Map Maker •A.P.T.s •Choplifter •Adventure Tips •Cranston Manor •Strange Odyssey.....

4 •Features: Ultima II Character Editor •Softkeys: •Ultima II •Witness •Prisoner II •Pest Patrol •Adventure Tips: •Ultima II & III •Copy II Plus Parm's Update

5 •Softkeys: •Homeword •Aztec •Bag of Tricks •Egbert II •Starcross •Hard Hat Mack •The Home Accountant •Reader's Softkeys: •Dark Crystal •Screenwriter II •Visifile •Lancaster •Bill Budge's Trilogy of Games •Sammy Lightfoot •Amper-Magic •Buzzard Bait •Feature: •Getting on the Right Track

6 •Softkeys: •Pandora's Box •Donkey Kong •Caverns of Freitag •Visifile •Features: •Program Enhancements: Quick.Bug •Personalizing A Program •Modified ROMs •Review •Essential Data Duplicator •The CIA •Core: •Data Bases.....

7 •Softkeys: •Zaxxon •Mask of the Sun •Crush •Crumble & Chomp •Snake Byte •DB Master •Mouskattack •Features: •Making Liberated Backups That Retain Their Copy Protection •S-C Assembler: Review •Disk Directory Designer •Core: •COREfiler: Part 1 •Upper & Lower Case Output for Zork.....

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9 •Softkeys: •Sensible Speller •Sierra-On-Line Software •The Visible Computer: 6502 •Reader's Softkeys: •Visidex •Music Construction Set •Gold Rush •Visiterm •Cosmic Combat •Features: •Super IOB •Adventure Tips: •Pirate Adventure •Mask of the Sun •Colossal Caves •Transylvania •Death in the Caribbean •Zork II •Core: •Word Search Generator •ProDOS to DOS •ProDOS on a Franklin Ace.....

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19 See available back issues...

20 See available back issues...

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IBM-RDEX

1988

Happy New Year to all IBMusers!

Finally, after serving the deprotection needs of the community of Apple-users for 6 years, COMPUTIST has opened its pages to another computer, and a whole new audience will discover the secrets of deprotection in this all-new IBMusers Reader's Data Exchange (IBM-RDEX).

Editorial

Getting a foothold in a traditionally Apple-dedicated magazine is going to be tough. It costs kilo-bucks to print COMPUTIST, and it has been going through financially rough times recently, as most readers know.

Apple-user subscribers will not subsidize a non-apple column. And they shouldn't have to. IBMusers RDEX must take care of itself. I think that 1K of new subscribers in a year's time would warrant expansion of IBMuser's RDEX to 8 or 16 more pages of important data than debuted in this issue.

In principle and in format, IBM-RDEX will follow the successful lead of Apple-RDEX at first. Apple RDEX succeeds as a forum because their readers respond promptly to each issue, and their reponses are in the very next issue!. It's very lively and up-to-date because COMPUTIST is composed that very month and not months ahead of time like most magazines.

Can IBM-RDEX emerge as a leading forum for deprotection as has Apple-RDEX? Let's try!

IBM-RDEX needs:

1. About 1K of new subscribers. Subscribers who (on their subscription form -- page 3) check the box marked 'I am a new IBM subscriber'.
2. Clear, concise, simple softkeys presented in a logical, step-by-step fashion.
3. Tutorials on copy-protection and disk formatting.
4. Useful and fun programs created by COMPUTIST readers for the benefit of all.
5. Notes, opinions, reviews....
6. A.P.T.s and Playing Tips, too.

Please send only material you originated. Please don't just copy (or print-out) material down-loaded from BBS. Send all contributions to:

IBM-RDEX editor
COMPUTIST
PO Box 110846-T
Tacoma, WA 98411

Remember that your letters or parts of them may be used in the IBM-RDEX section even if your don't specifically address it to the IBM-RDEX editor. We reserve the right to publish any correspondence we receive. And what does get published may be edited for clarity, grammer and space requirements.

Because of the empheral and unpredictable appearance (and disappearance) of our part-time and volunteer staff, any response to your written queries will appear only in the IBM-RDEX so it would be more appropriate for you to present

technical questions to the readers and ask for their responses which will then be placed in the next issues.

COMPUTIST does not purchase articles or programs...IBM-RDEXed

Other Words

We also need to build up our own MOST WANTED SOFTKEYs to let our readers know which programs to work on and what softkeys to send in for publication.

Finally....

Please put out the word:

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Readers Data EXchange

No 'Input' or 'Readers Softkey & Copy Exchange'

The old INPUT and the READERS SOFTKEY AND COPY EXCHANGE columns have now been combined into the new Readers Data Exchange (or RDEX, pronounced AR-DEX).

All softkeys, comments, articles, questions, answers, fixes and bugs and almost any other information that must be printed in a timely fashion will be placed in RDEX.

Although we will print letters and article-softkey submissions that are received as only printed text, we would prefer that they be submitted on disk.

We no longer purchase articles or softkeys

That's right. The author's 'by-line' is the only payment offered to COMPUTIST writers who get published. Even the staff is composed of unpaid volunteers.

Of course, COMPUTIST reserves the right to edit and publish ANY contribution (whether submitted as a letter-to-the-editor or article-softkey) in the RDEX section.

All published contributions become the property (and are copyrighted as part) of COMPUTIST magazine.

How to get your name on RDEX contributors list

Whether you are contributing data to RDEX or just asking a question, we urge you to follow these writer's guidelines.

- All contributions and submissions should be submitted in **both** printed format and on disk.
- Your printout must use only one side of the paper.
- Text should be double-spaced using a non-compressed font with both upper and lower case.
- A letter quality mode is preferred, with each page torn at the perforation only.

- Pages need not be stapled together.
- The first page should contain the following data:

**TITLE OF WORK
FULL NAME OF AUTHOR
ADDRESS
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- Each page of the manuscript and program listing should include the author's name, the title of the work, and the page number in the upper right hand corner.

A standard text file on a DOS 3.3 5¼" floppy disk

The article and any accompanying program should be submitted as a **standard text file on a DOS 3.3 disk**. Label the disk with the title of the work and the author's full name and address.

ON DISK, TEXT MUST BE SINGLE-SPACED ONLY. Please identify your editing program.

We always try to return your disks as soon as possible. Still, to protect ourselves, we must say that we are not responsible for unreturned submissions.

Here's how best to 'talk' to COMPUTIST readers

A. Always assume that your reader is a novice and explain all buzzwords and technical jargon. Pay special attention to grammar and punctuation. We require technical competence and good, readable style.

B. A list of hardware and software **Requirements** should be included at the beginning of the manuscript. When published, this list will be offset from the main text.

C. Include the manufacturer's or publisher's name when a commercial program or product is mentioned.

D. When submitting your own programs, first introduce the purpose of the program and features of special interest. Include background information describing its use.

Tips for advanced uses, program modifications, and utilities can also be included. Avoid long print statements and use TABs instead of spaces.

Remember: A beginner should be able to type the program with ease. A program will not be accepted for publication without an accompanying article.

These articles, as well as articles on hardware and DOS modifications **MUST** summarize the action of the main routines and include a fully remarked listing.

F. GENERAL ARTICLES may include advanced tips, tutorials, and explorations of a particular aspect of Apple computing.

G. SOFTKEYS must contain detailed step-by-step procedures. Number each step

For each softkey, first introduce the locking technique used and then give precise steps to unlock the copy-protected program.

Please do NOT send any original commercial disks

We accept articles which explain locking techniques used in several programs published by the same company.

H. APTs or **ADVANCED PLAYING TECHNIQUES** can deal with **alterations** to a program, deleting annoying sounds, acquiring more points in play and avoiding hazards.

Again, provide step-by-step instructions to complete each APT and explain each step's function.

Please mail all letters, short articles and softkeys to the *RDEX Editor*. When accepted for publication, they will be **IMMEDIATELY** edited, typeset and entered into the next RDEX.

Remember that we cannot purchase these contributions.

RDEXed
PO Box 110846-T
Tacoma, WA 98411

The Hacker's Ultimate Copy & Deprotection Utility Super IOB Collection !

ALL of our Super IOB controllers (through 1986) in 'ONE' package!

COMPUTIST developed the ultimate copy program to remove copy protection from software:

The Super IOB program.

Since the introduction of Super IOB, COMPUTIST has used this flexible program to deprotect (or partially deprotect) dozens of commercial programs with far ranging protection schemes.

Super IOB deprotects disks by using a modified RWTS (the subroutine in DOS which is responsible for the reading and writing of disk sectors) for reading from the protected disk and then using a normal RWTS for writing to the deprotected disk.

This package contains:

- ▶ **TWO DISKS** (supplied in DOS 3.3). Each disk contains at least 60 Super IOB Controllers including the standard, swap, newswap and fast controllers. Also included is **version 1.5 of Super IOB**, the Csaver program from COMPUTIST No. 13, and a Menu Hello Program that lists the available controllers and, when you select one, automatically installs it in Super IOB and RUNS the resulting program."
- ▶ A reprint of **Disk Inspection and the Use of Super IOB**, from COMPUTIST No. 17. This article explains how to write your own Super IOB controllers.
- ▶ **COMPUTIST No. 32**, which contains an extensive article detailing the hows and whys of Super IOB v1.5 and at least 5 articles using the new Super IOB program.
 - Several of the controllers deprotect the software completely with no further steps. This means that some programs are only minutes away from deprotection (with virtually no typing).
 - The issue of COMPUTIST in which each controller appeared is indicated in case further steps are required to deprotect a particular program."

The SUPER IOB Collection

Volume 1 of the Super IOB collection covers all the controllers from COMPUTIST No. 9 through No. 26. Also included are the newswap and fast controllers from COMPUTIST No. 32. The following 60 controllers are on volume 1:

Advanced Blackjack, Alphabet Zoo, Arcade Machine, Archon II, Archon, Artsci Software, Bank Street Writer, Barrons SAT, Beyond Castle Wolfenstein, BSW //c Loader, Castle Wolfenstein, Computer Preparation, SAT, Dazzle Draw, DB, Master 4 Plus, Death in the Carribean, Dino Eggs, DLM Software, Electronic Arts, F-15 Strike Eagle, Fast Controller, Fathoms 40, Financial Cookbook, Gessler Software, Grandma's House, The Heist, In Search of the Most Amazing Thing, Instant Recall, Kidwriter, Lions Share, Lode Runner, Mastertype, Match Maker, Miner 2049er, Minit Man, Mulplot, Newsroom, Newswap controller, Penguin Software, Print Shop Graphic Library, Print Shop, Rendezvous with Rama, Rockys' Boots, Sargon III, Sea Dragon, Shiela, Skyfox, Snooper Troops, Standard controller, Stoneware Software, Summer Games, Super Controller, Super Zaxxon, Swap Controller, TAC, Ultima I-II, Word Challenge, Xyphus, Zaxxon

Volume 2 of the Super IOB collection covers all the controllers from COMPUTIST No. 27 through No. 38. The following 65 controllers are on volume 2:

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