For The Serious User Of Personal Computers

COMPUTIST

Issue 65 April 1989

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RDEX Features:

- **The Product Monitor** — By Jeff Hurlburt
- **Convert Appleworks file to DOS 3.3 text file** — By Ronald E. Riggs
- **Editor Creator II** — By Bob Igo
- **Make your own APT** — By Bob Igo
- **A Walk-thru guide to Questron II** — By John E. Wanner
- **Wrath Mapper** — By Perry L. Holman
- **Some IIgs notes** — By Dave Morgan
- **Fixing the Core Disk Searcher** — By Bill Jetzer
- **Help with 3½″ disk copy protection** — By Brian A. Troha

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RDEX

Writing to the RDEX editor

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- Remember that your letters or parts of them may be used in RDEX even if not addressed to the RDEX editor. Correspondence that gets published may be edited for clarity, grammar and space requirements.

- Because of the great number of letters we receive and the ephemeral and unpredictable appearance of our part-time staff, any response to your queries will appear only in 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 Apple-RDEX.

- Please include your name (or pseudonym) and address so we can forward your mail.

- Whenever possible, send your articles and letters on disk as standard text files. When we get your letter-article in a text file, it is *immediately* uploaded into the most current RDEX file. We will return your disks, whenever possible, with the current library disk copied onto it. Conventional letters must be typed in by us, with resultant delay and errors.

- When you send your material on disk, try to use a disk formatted for Apple DOS 3.3. It makes things a lot easier for us.

- When writing to request help, be sure to include **ALL** relevent information. The more information you include, the easier it is to figure out what is the matter. Our readers privacy is important, so we will not print your address unless you specifically say too.

- When writing to one of the RDEX authors. Write your letter and seal it in an envelope. Put your return address, the authors name (as it appears in RDEX) and the correct postage on the envelope. Put this envelope into another and send it to RDEX. We will put the correct address on your letter and drop it into the mailbox.

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Current Paid Subscribers: 3699 change from last issue: -35

COMPUTIST is a Newsletter?

Yep! That's right. It may be a bit fancy for a newsletter, but that's what it is. It's sort of like a hardcopy BBS (Bulletin Board System). COMPUTIST has never really been a commercial magazine. The nature of our content (copy deprotection info) prevents us from getting the kind of advertising that supports commercial ventures. But that means we're not influenced by any software companies, and we print (almost) anything having to do with computers. So, if you have a problem, write and tell us all about it. Chances are, someone else if having the same kind of problem and someone else may have already solved it. If you have done something neat or discovered something new or just want to pass on some rumors, write to RDEX and let everyone else know.

Writing to RDEX?

There seems to be a lot of confusion about how to send letters to RDEX. It's really very easy. Here is the definitive method (definite maybe).

Send everything on disk.

That's all there is to it. Use whatever text editor you like, but tell us which one. Put a label on the disk with your name (or pseudonym) and address (if you want to receive answers). Don't preformat any programs. That is, send Applesoft programs as normal Applesoft files and machine language programs as normal binary files. We have programs to convert them to the proper format for printing. If you are sending source code files, send them as normal text files.

Don't send hardcopy (printout) unless it is something of an emergency.

If you are writing about your subscription or sending an order, do send the letter on paper. Karen keeps all hardcopy and forwards the disks to me.

Pseudonyms and addresses

Some of our writers have a real love affair going with their pen names. Some of the names are a bit eccentric. What you decide to use as your "handle" is entirely up to you. However, if you want to receive mail, I need to have some kind of address. I have some letters that I can't foward due to lack of addresses. If you are one of the "floating" pseudonyms, perhaps you could find a suitably anonymous post office box and let me know the next time you write. I hate to have mail sit around, undelivered.

BUGS:

COMPUTIST #64, pg 27. The edit for Dive Bomber got scrambled in translation. Here is the correct edit.

A9 00 85 F0 85 F2 85 F3 A9 FC 85 F9 85 FC 85 FF A9 EE 85 FA 85 FD 85 FE A9 5A 85 F4 85 F5 A9 E7 85 F8 85 FB A9 FB 85 F1 A9 30 85 F6 A9 83 85 F7 4C 81 5F

COMPUTIST #12, pg 19. See Bill Jetzer (Core Disk Searcher) - page 32.

COMPUTIST #47, pg 32. See Craig Meekins (Mindshadow) - page 32.

COMPUTIST #48, pg 21. See John T. Chiao (Print Shop) - page 7.

COMPUTIST #52, pg 29. See Thomas V. Rapheld (RDOS Transfer) - page 27.

COMPUTIST #61, pg 19. See Charles Taylor (COFA Copy) - page10.

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Readers Data EXchange

For serious users of Apple computers: II, II+, //c, //e, IIgs, Macintosh

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 the DOS 3.3 System Master disk).

Commands and control keys

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 [CTRL-P]

Press [6]. Next, place one finger on the [CTRL] key and then press [P]. Don't forget to press [RETURN].

Other special combination keypresses include [CTRL-RESET] or [OPEN-APPLE-CTRL-RESET]. In the former, press and hold down [CTRL] then press [RESET]. In the latter, press and hold down both [CTRL] and [OPEN-APPLE] then press [RESET].

Software recommendations

The Starter Kit contains most of the programs that you need to "Get started". In addition, we recommend that you aquire the following:

- Applesoft program editor such as "Global Program Line Editor (GPLE)".
- 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.

Apple //gs: If you have the 2.x ROM, there is a hidden classic desk accessory (CDA) that allows you to enter the monitor. In order to install the new CDA, you should enter the monitor before running any protected programs (CALL -151) and press "# [RETURN]". This will turn on two hidden CDAs, *Memory Peeker* and *Visit Monitor*. Thereafter press [OPEN-APPLE-ESC] to go to the Desk Accessories menu. Select "Visit Monitor" and there you are. Use [CTRL-Y] to exit.

Recommended literature:

- ***Apple II Reference Manual (or IIe or IIc)***
- ***DOS 3.3 manual***
- ***Beneath Apple DOS & Beneath Apple ProDOS***, by Don Worth and Pieter Lechner, from Quality Software

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 don't pose a problem except when they are inside of quotes or after a DATA command. 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, only type spaces within quotes or after DATA statements if they are shown as delta (^) charactors.

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. When finished, return to BASIC with:

```
3D0G
```

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

The source code is printed to help explain a program's operation. To enter it, you need an "Assembler". Most of the source code is in *S-C Assembler* format. If you use a different assembler, you will have to translate pieces of the source code into something your assembler will understand.

Computing checksums

Checksums are 4-digit hexadecimal numbers which tell if you typed a program correctly. 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 are on the "Starter Kit".

If your checksums do not match the published checksums then the line where the first checksum differs is incorrect.

CHECKSOFT instructions: Install Checksoft (BRUN CHECKSOFT) then LOAD your program. Press [&] to get the checksums. Correct the program line where the checksums differ.

CHECKBIN instructions: Enter the monitor (CALL -151), install Checkbin at some out of the way place (BRUN CHECKBIN, A$6000), and then LOAD your program. Get the checksums by typing the Starting address, a period and the Ending address of the file followed by a [CTRL-Y].

```
SSSS.EEEE [CTRL-Y]
```

Correct the lines at which the checksums differ. ..... RDEXed

John T Chiao

There is a misprint in Marshal P. Brown's softkey for the Print Shop (color version) in COMPUTIST #48, pg 21. In step 2, the search string is shown as "20 31 08 (JSR $083A)". It should read 20 3A 08 (JSR $083A)". At least, that's what it took to fix my recently (1/23/89) purchased copy.

Thomas H-E Jacks

(?) What I would like to know is if there is anyone at your end that could correspond with me and assist me in becoming more proficient with computers. I have the use of an APCC computer with 64K of memory. I would very much like to learn as much as possible about programing. The only courses that are available here, I have already completed, BASIC, Magic Window II, and some Pascal. I would very much enjoy hearing from anyone on your staff or anyone else that can assist me in this matter.

FPS #267874-A
Box 1200
Agassiz, B.C.
Canada V0M 1A0

George Sabeh

Softkey for...

Superprint
Scholastic Software

■ **Requirements**

☐ COPYA or any fast copier
☐ 6 single sided disks

A previously published softkey didn't work for me. The version I have copies with COPYA indicating a normal format. The copy made will load ProDOS and immediately after displaying the ProDOS logo reboots. After searching previous protection methods employed by Scholastic, it was evident that they are using a signature check in the first system file.

I would like to digress a moment for the benefit of new subscribers. Upon booting a ProDOS disk, ProDOS is loaded into memory at $2000 and the first .SYSTEM file is loaded next. It was apparent that the signature check is in the first system file. Cataloging the copy made indicated the first system file is SPSTRT.SYSTEM which is only one block long and is followed by SP.SYSTEM which is the boot system. This was explained by Jim Hart in COMPUTIST #61, pg.35.

[1] Copy all six sides using COPYA or a fast copy program.

[2] Now you can catalog the disk. Either delete SPSTRT.SYSTEM or enter BASIC using ProDOS and rename the file.

RENAME SPSTRT.SYSTEM,SPSTRT

Put away your original and enjoy an excellent program.

(?) I also have a request for some of your expert readers. I always seen to have difficulty finding a nibble count or signature. I'm usually successful in converting a program to a normal format but then seem to run into difficulty going further. Maybe someone can write an in depth article with guidelines for deprotecting software with signature checks.

(?) I'm also interested in an article about boot code tracing, I realize there has been some discussion of this subject before. Converting from DOS 3.3 to ProDOS has been difficult for me and much of the information I have read in COMPUTIST is related to DOS. What about an article about the normal booting of ProDOS and defeating different modifications to ProDOS. Jim Hart's article in COMPUTIST #62, pg.23 is a good start in that direction.

Softkey for...

Slide Shop
Scholastic

■ **Requirements**

☐ COPYA
☐ 6 disk sides

The protection on this software is minor and can be discovered by using a nibble editor. I used Copy II Plus and found there is protection only on side 1 of disk A. Even tracks are normal but odd numbered tracks have been modified. The address prologue has been changed from D5 AA 96 to D4 AA 96. Also the epilogue has been changed from DE AA EB to AF AB AB. I'm sure a controller would be simple to write to unprotect this program, but I elected to use COPYA and modify DOS to ignore the first byte of the prologue and also ignore the epilogue.

[1] Boot DOS 3.3 and use COPYA on side 1 of disk A.

CALL-151	*enter monitor*
B954:29 00	*ignore 1st prologue byte*
B988:18 60	*ignore epilogue errors*
RUN COPYA	

[2] Use COPYA or any fast copier to copy all other sides.

This will produce a COPYA-able version that has no protection and can be cataloged by ProDOS. I found this also works on some of the other Scholastic Software.

Bill Todd

(?) I have a little problem. I have the game "Where in the USA is Carmen Sandiego" and would like to make a backup copy. I sent away for COMPUTIST #52, so I could deprotect it, but the softkey isn't complete. I did the softkey anyway and then found that there was still more protection on my disk. The softkey needs more steps. Has someone completed the softkey? Can anyone help me?

I'd also like you to encourage the people who write the softkeys, to explain how they know what bytes to change. I don't know machine language, so I can't understand what they are doing. I would like them to go into more detail about what they looked for.

Some notes on changing high scores

After reading in COMPUTIST #62 about how to change the high scores and the names of the people who have the high scores on California Games, I decided to find out if other games use the same principle for their high scores. Some games do, but some games don't. After some work, I found that most games use the same type of principle. Here's how to change the scores and names.

[1] Load the game that you want to alter. Write down the names of the people who hold the high scores and their scores.

[2] Run a sector editor that has a text editor on in. (I used COPY II+ v7.4).

[3] Search for the names or the high scores that you wrote down.

[4] When you find the names or the high scores, just change them to whatever you want. Then save the sectors back to the disk. (If you don't find the names or the high scores, they might be in code.)

This is an easy way to amaze your friends without playing the game for days. Have fun.

Ken Burnell

In COMPUTIST #60 you printed a letter from me that, among other things, asked for more APT's. In the same issue I found two that I had been patiently waiting for. Then, I had to open by big mouth and tell my 7yr. old son that, in the morning I would have a special disk for him of his favorite game that would be easier to play. Later that night I copied the original, got out Copy II Plus's sector editor and checked for the tell-tale bytes. They weren't there! In the morning my son woke me up about 5:30 asking where the new disk was. I had to tell him that I couldn't make it and I had a very disappointed little boy on my hands.

The point of this tale is that a lot of

contributors to COMPUTIST are sending in their sector edits in a very poor form. Too many say "go to track nn, sector ss, byte bb and change it to cc". That's great if you happen to have the same version as the guy who cracked it, but almost worthless if you don't.

I know that it takes many hours to come up with most cracks, so how much more effort would it take to add a few bytes in front of the key ones and a few after, so a guy with a different version of the software could do a search for the required bytes?

Over the years I have written for several products advertised in COMPUTIST and have always been very pleased with them. Recently,I decided that you were not going to publish a new index like that in COMPUTIST #15 and I searched my back issues for an ad for a COMPUTIST index and found it in COMPUTIST #57. I ordered it and had it within a few weeks.

David Hopkins has obviously put in hundreds of hours on his Computist Super Index (CSI).I have used it many times and am thinking of putting it permanently on my RAM disk for frequent access. I would like to suggest that you mention the CSI on the RDEX introduction page. That's how valuable I think it is.

And speaking of value, I recently used two IBM RDEX items. Thanks for adding the IBM goodies to COMPUTIST, bring on some more.

Leonard R. Simon

? I would appreciate anything you can do to help me with the problems I'm having with my hard disk and the Super IOB Collections, disks 1-3.

I'm using an Apple IIe (not enhanced), with 1 meg internal memory card and piggy back RGB card (Applied Engineering), a Sider 20 Meg hard disk, an Amdek RGB color monitor, Epson printer, and modem. My hard disk is partitioned into 8 DOS 3.3 sections, 5 are normal disk size and 3 are 1.5 meg each. I also have a partition for ProDOS and one for CPM.

I'm having two problems with the Super IOB Collection, when I copy files to a blank 1.5 meg section of my DOS 3.3 partition on my Sider. Problem #1 is that once I copy the 6 BASIC files, I then can only add 98 "CON." files. If I add just one more "CON." file and run "SUPER HELLO", I get the catalog, but no matter what key I push, the inverse selection will not move and I get locked in with your message about the possible need to refer to COMPUTIST for additional parameters. If I eliminate the additional file everything works fine. Problem #2 is a major one, if I run Super IOB with only the 98 files in it, it will work fine in selecting a CON. file, but when I answer yes to Format, my floppy disk drive #2 runs, but doesn't click and I get a message "loading utilities to hard disk " which really doesn't do anything and the disk in my drive doesn't get formatted and I'm locked up.

Any changes to the Super IOB disk or a letter with changes so that I can eliminate these two problems would be greatly appreciated. The convenience of using Super IOB on my hard disk is very important. In addition, is there a small program available so that once I have combined more than one diskette of CON. files in my DOS 3.3 partition and volume, that will alphabetize all the CON. files for convenience. The only utility I have that will alphabetize my catalogs is Copy II +7.1 and that's only good on hard disk for ProDOS or an individual floppy. I have ordered alphabetize on your public domain disk #0074 in hopes that I could copy that onto my hard disk and use that.

! *Has anyone else tried to load all the controllers onto one volume of a hard drive? Has anyone succeeded? It sure sounds like a good idea.*

I think the problem with Super Hello has to do with the way the file names are fetched from the disk and put into a string array. Perhaps the array can be dimentioned larger.

Any ideas? . . . . . RDEXed

Greg Mazourek

Softkey for...

Rampage
Activision

■ **Requirements**

☐ One blank disk
☐ Fast copier (Super IOB)
☐ Sector editor

The softkey is the same as the one in COMPUTIST #55 for Activision's Paper Models. Standard Activision protection.

[1] Copy the Disk.

[2] Search for A9 56 85 FD A9 . . . 38 2A 25 FC (the "..." means all of the bytes in between).

[3] Change the string to EA EA EA . . . EA A9 FF.

I found the code on track $00, sector $0D, bytes $41 through $82.

Ken Foerster

? I've been trying to follow the instructions in COMPUTIST #13 for CSAVER starting on pg.16. Will you please tell me what I'm doing wrong in the following sequence:

1. Brun CSAVER
2. Load controller
3. & H
4. Load SUPER IOB
5. & M

After I do all this I get the statement "? Out of Data Error in 170". When I list 170 I get:

```
170 READ A1, A2, A3, A4: POKE 47505, A1: POKE
    47515, A2: POKE 47413, A3: POKE 47423, A4:
    RETURN
```

How Do I overcome this Data Error?

? I live in Corpus Christi, TX. Can you give me the names of any other "COMPUTISTs" in my area? Any help will be appreciated.

! *We have noticed that with some controllers, CSAVER will return an error message (usually syntax error) when "hiding" (&H) the controller. It seems to be related to the size of the controller. But it doesn't stop CSAVER from working. We have never gotten the error message that you get. Are you sure that the error message occurs when you merge (&M), or does it occur after you run SUPER IOB? In which case, it is the controller that is in error and not CSAVER. Check to see if the DATA statements that line 170 is trying to read actually exists in the controller.*

Is there anyone in the Corpus Christi area that can help? . . . . . RDEXed

Stephen M. Caraco

I have just received my second issue of COMPUTIST, and must say that it is a great magazine. I can't stress enough how valuable this magazine is, because it enables me to make backups of my valuable disks that can be transferred to a hard disk.

Softkey for...

Zany Golf
Electronic Arts

I noticed this one on the list of most wanted softkeys. After several hours of hard work and trial and error, I was able to come up with a simple change to the disk that makes it copyable.

Block	Byte(s)	From	To
$013	$010	20 2E 36	EA EA EA

? The crack for the Toy Shop does not work for me. I did find the byte string 20 00 B8, but changing this to EA EA EA doesn't work. Using Copy II+ bit copy v8.3, I tried to figure it out. I can only select 6&2 or 5&3 encoding when I select CUSTOM. I noticed that the sectors on the Toy Shop are loaded with 4&4 encoding. Is this why I can't search the disk, and instead keep getting error after error? When I did the byte change, the disk kept re-booting itself. I can't search for the usual 4C 00 C6,

because of the errors. Version 7.4 of Copy II+ had a parm for this disk, which did work, but it didn't completely crack the disk, and all versions of Copy II+ released after 7.4 didn't include this parm. Unfortunately, I no longer have version 7.4, so I can't see what was done to the disk. Help!!!

? I own originals of Bubble Ghost by Accolade and Leisure Suit Larry from Sierra On-Line. It is most frustrating to play these games,because of the special copy protection they have. First of all, every time I load up BUBBLE GHOST, one of the levels appears on the screen. I then have to refer to a very difficult-to-read paper which pictures each level with a number next to it. If I don't enter the correct number, I can't play the game. I can see Accolade's point in this form of copy protection, but just the same I know there must be a way to skip this log-on routine each time I play the game. I know because I've seen it done with games like Vegas Gambler. I would be more than grateful if you could publish a byte change that would eliminate the ridiculous manual check!

? Along these same lines, I seldom play Leisure Suit Larry because of their "pirate protection." Even though I'm 20 years old, I still have trouble answering some of the stupid questions that appear before you can play the game! Even some adults don't know some of these questions, so I sometimes find myself re-booting and trying again three or four times. I'd like to skip this question asking at the beginning of the game all together, if possible. Please work on this one.

? I'd probably be asking too much if I were to ask for a way to play the bonus screen of Zany Golf without getting par or better in the first nine levels. Perhaps a byte change can be done so that this bonus level always loads up after the energy level, regardless of previous scores.

I'd like to thank you for taking the time to read this letter, and I'm eagerly awaiting any form of reply to these questions. I will continue to work on the programs that are on your Most Wanted List. I'll let you know as soon as I make any progress. Thank you very much for a great magazine.

Alan Wilson

Mr.Johnson might find that "The Calculus Toolkit" published by Addison-Wesley (#16877) might help him learn calculus. The package includes 4 disks with 29 programs and a 300 page manual. The best part is that the package is only $16.95.

? Does anyone know how to put all four 5¼" sides of Certificate Maker on one 3½" disk? The program is very picky about the volume names of the disks. It can be copied to four 3½" disks, but not one. Seems to be picky about which volume each of the certificates is on.

? Does anyone know an easy way of converting DOS 3.3 Print Shop pictures to ProDOS so they can be loaded on a 3½" disk. The DOS to ProDOS conversion utility leaves the pictures in the wrong format for Print Shop.

Keep up the IBM RDEX--many of us have several computers.

Eric Thuse

Softkey for...

Certificate Maker's Library Vol.1

Springboard Publishing

If this disk is copied with any disk copier such as Copy II+, Locksmith Fast Copy etc., it will work fine with a broken copy (COMPUTIST #62 & #43) of Certificate Maker.

This copy will not work with the original disk of Certificate Maker, indicating that it's copy-protection is tied to the main program. Also, the library disks will now work in slots other than #6.

I have enjoyed your magazine almost from it start and am renewing my subscription. Hope you will expand to cover the Mac now that you also have RDEX for IBM.

RDEX is an open forum. If you write it, we'll do our best to print it. So far, only one person has sent any info on MACs. Perhaps someone out there has some notes that they have been sitting on.
. . . . . *RDEXed*

Don L Jackson

I would like to have "Stickybear Math, Add & Subtract" added to the most wanted list. I would also appreciate it if you could put this letter in the next issue. I tried the procedure in COMPUTIST #26 and it did not work on this program although it did work on several other Stickybear programs I had. If anyone has any information on this I would appreciate it.

Rob Fiduccia

? I have been getting COMPUTIST for a year now. I have mailed two letters in. The first was "Help with Deathlord" in COMPUTIST #58. I was asking for APT info and a softkey. Well in about 2 or 3 weeks I had found the bytes and info to do the APTs. I mailed all the information to do so in a letter printed on my printer.

I was aware that it won't get in until you had the time to retype it. I was not worried about that. But I really wanted to put it in a text file? That is my question. What do you mean by a DOS 3.3 text file. And you also mention "it makes things much easier" if it is not DOS 3.3. Well, what really do you do with the file? You also say that it gets put in the RDEX immediately, why? And from my understanding, if it's big or not on disk you'll put it in the RDEX, right? And what is so special about DOS 3.3? What would happen if I used a ProDOS? I rarely ever use text files, I have no reason. And also, you say that you'll mail the disk(s) that have the letter back as fast as you can, or when you can. I thank you for that. The reason I'm asking you all these questions, dumb or not, is that I have many things to write to you about, and I want to know the fastest way to put them in the magazine. I do know that if I send a letter from the printer and it's only one page, then it'll be in soon. But I have pages of things, and if I print it out, then they can only go in when you have the time, (I do understand how busy you are) and it'll take a long, long time. So please answer my questions about sending stuff on disk or on paper through the mail, NOT in the magazine because it takes to long. You can however print this letter in the newest magazine and the answers to my questions because there might be other people that send in letters and don't fully understand what is really happening. But please write back and tell me the answer to these questions so I can start to work on my letter as fast as possible. I don't have a DOS 3.3 text file writer. If you know of one, can you please tell me.

First and most important — send all of your letters on disk.— Don't send paper copies of your letters unless it involves something that must go in the next issue (such as a bug, or other warning) or a note to Karen about your subscription.

Use whatever wordprocessor you want. Send any Applesoft programs as Applesoft programs and any binary programs as binary programs on disk. Don't try to merge them into your letters as text. Doing so only make things harder at this end as we have to edit them out. We have programs here for capturing programs and they generate the checksums at the same time. It's policy here to capture all programs ourselves in order to insure the correct checksums are printed.

You can use DOS or ProDOS disks. The only difference is that I will convert the ProDOS files to DOS files when I receive them. If you send DOS disks, it saves me one additional step, which saves time. (A very precious commodity.)

Material received on disk is put into COMPUTIST in chronological order (first in, first out). I don't like to jump the line (although I have

done it in the past) it's not fair to other writers.

One of the final steps to assembling the magazine is the typeset flats that are sent to the printers. At this time I copy the pages that your letter is on and I copy that issue's library disk onto your disk. Then I send them both to you, First Class. That way, you get your disk back and you get a peek at the next issues contents. Of course, that assumes that you sent your info on disk.

We do make a creditable effort to type written letters and put them in the next issue. But I know that I have skipped over long multi-page letters, in favor of shorter half page letters, when I'm doing the typing. I am especially averse to long letters, obviously printed on a dot matrix printer. I assume that the letter was written with a text editor before it was printed. I can't understand why they didn't send it on disk.

So that's the why of it. It saves us time and money, and there's never enough of either of those around here. . . . . .RDEXed

Steve Robinson

Softkey for...

Coast To Coast

C NeoSoft Inc.

■ Requirements

☐ DOS 3.3 System Master
☐ 1 Blank disk
☐ DOS Copier

This program is good for young children to help them learn facts about the 50 states in our nation. It is not protected very well which you will soon see.

[1] Boot your DOS 3.3 system disk.

[2] Tell DOS to ignore checksum and epilog errors and use COPYA to copy the disk.

POKE 47426,24
RUN COPYA

[3] Use Master Create to copy DOS from System Master to copy of Coast to Coast.

Put the original away in a safe place and enjoy your copy.

Irwin Roth

In COMPUTIST #61, Mike Basford mentions a program "CRACKER" which I have been unable to find. Please put me in contact with Mr. Basford or advise where or how I may attain this program.

The instructions for contacting another writer are on page 3 (left hand column, next to last paragraph at the bottom of the page) of this issue. . . . . .RDEXed

Frank M. Polosky

A.P.T. for...

Run For It

Optimum Resource

Run For It, is a good Arcade Adventure game of about 54 rooms, but with many extras. (Elevators and one way exits that place you in a different room.) Start with Room A and find the exit at Level R. I kept getting killed by "running out of time" rather than by the creatures in the game. Something had to be "fixed"!

How did I do it? As my 1st APT, I'll explain the way I wish other people would, instead of "hiding" their secrets. Each (life) canister has 9 countdown clicks, so 5 starting cans times 9 equals 45. Using Copy II+, I searched for 45 but that didn't work. So I decided to search for the hex value 2D (45 decimal is 2D in hex). I had 3 choices to search for 45 or 2D in hex.

```
A9 2D  LDA #$2D      Accumulator
A2 2D  LDX #$2D      X-Register
A0 2D  LDY #$2D      Y-Register
```

I got lucky on my first try (A9 2D), so I changed 2D or FF and came up with "extended time". (2D = 45, FF = 255) This edit changes the value of each canister from 35 seconds to 2 1/2 minutes each. Search the disk for A9 2D and change the 2D to FF. I found it on track $07, sector $03.

I also had trouble with my high score table as it would not write the "high score" to disk for the 5th place score. I used Copy II+ to search for my initials in Text. The "high score table" was found on track $00, sector $0F. A score of 3790 is found as B3 B7 B9 B0. 00 - 09 doesn't work. To change things, you must use B0 - B9 or things really get messed up. Changing scores in hex and initials in Text works, I can now save 5 new top scores and get rid of "unwanted scores and names". Use a sector editor to make the changes (use a backup to be safe).

A.P.T. for...

Oils's Well

Sierra OnLine

A score of 14,980 is stored as 01 04 09 08 00 in hex. You can use 00 - 09 to change the score in this game. Search for score in hex, or search text for your initials. This and similiar techniques can be used to change many "High Score" and "Vanity" tables. Be careful use a backup, not all games are the same and you may need to experiment a little.

? I spent several hours and was unable to change the timer of 990, or increase the number of lives. If anyone can help with this, I'd like to hear how you did it. (I give up on this one).

Charles Taylor

In COMPUTIST #61 you published my crack for COFA courseware. You omitted my BASIC program that copies the protected track. Please print the program and also print my apology to Blackbeard. I inadvertantly called him Bluebeard. Blackbeard was the scourge of the bounding main in the 17th century, and is the scourge of the copy protectors in the 20th century.

Oops! That's the second time I've left out a program. Maybe I need to take a break and get away from here for a while. Anyone out there got an extra room to let for a week?

. . . . . .RDEXed

COFA Copy

```
10 REM B = SECTOR NUMBER(0-15)
20 REM C=MEMORY LOCATION($2000-$2F00)
30 PRINT CHR$ (4) "BRUN^SREAD/SWRITE"
40 A$ = "READING^TRACK^#35"
50 B$ = "WRITING^TRACK^#17"
60 PRINT "INSERT^ORIGINAL^DISK^AND^PRESS^ANY^
   KEY" : WAIT - 16384,128: GET A$
70 HTAB 21 - LEN (A$) / 2: PRINT A$
80 PRINT CHR$ (4) "MON^C,I,O"
90 FOR B = 0 TO 15
100 C = 2 * 16 ^ 3 + B * 16 ^ 2
110 D = C + 1
120 PRINT CHR$ (4) "SREAD^T35,^S" ;B; ",A" ;C
130 PRINT D: POKE D,17: NEXT B
140 PRINT "INSERT^COPY^IN^DISK^DRIVE^AND^PRESS^
   ANY^KEY" : WAIT - 16384,128: GET B$
150 HTAB 21 - LEN (B$) / 2: PRINT B$
160 FOR B = 0 TO 15
170 C = 2 * 16 ^ 3 + B * 16 ^ 2
180 D = C + 1
190 PRINT CHR$ (4) "SWRITE^T17,S" ;B; ",A" ;C
200 NEXT
210 PRINT "NEED^ANOTHER^COPY?^(Y/N)" : GET C$:
   IF C$ = "Y" THEN GOTO 60
220 PRINT "COPY^DONE,^COPY^NEW^DOS^TO^COPY^
   DISK" : END
```

Checksums

```
10  - $BADD     120 - $AB3D
20  - $9B13     130 - $8A82
30  - $B53C     140 - $0DD9
40  - $B428     150 - $0851
50  - $1D4A     160 - $F319
60  - $AE03     170 - $D7DB
70  - $3048     180 - $AF76
80  - $2C15     190 - $BA70
```

90	- $6590	200	- $C207
100	- $BC2A	210	- $1757
110	- $0E52	220	- $E8E8

James J. Harvey

Softkey for...

Weather Forecaster

CBS Software Co.

This is a great program for young and old, and one can learn a lot about the general weather on our planet by using it.

[1] Boot DOS 3.3 System Master. Remove the master, insert a blank disk, initialize it and set it aside.

INIT HELLO
DELETE HELLO

[2] Insert The System Master disk in drive one.

POKE 47426,24
RUN COPYA

[3] Remove the System Master disk and insert the original of Weather Forcaster into drive one. Insert a blank disk into drive two and start the copy procedure.

[4] When the copy procedure is finished; remove the original from drive one and insert the System Master disk.

BRUN FID *or your favorite file copier*

[5] Remove the System Master disk from drive one and insert your copy of Weather Forcaster into the drive. Insert the disk that you previously initialized into drive two, and copy all of the files to the disk in drive two

That's it, you now have a deprotected copy of Weather Forcaster.

The Mad God

I got hold of COMPUTIST #59 and #60 in October and I am very interested in your magazine. I am not a subscriber since I find $8.75 per month too much. I simply cannot afford it. Maybe some day when I'm richer or you're cheaper...

I find your softkeys especially helpful. I have always found copy protection of programs a nuisance. I've done some cracking myself, and I thought you might find them interesting.

I have a Apple IIgs with two disk drives and 1M memory expansion. For copying I mostly use Copy II Plus v8.3 and for disk editing, I use Block Warden written by Glen Bredon. This last utility you can find on Prosel. I wrote all my softkeys with these programs, but I guess any other good block editor will do. In my softkeys when I say "copy disk", I refer to the copy option in the utility menu of Copy II Plus unless mentioned otherwise. (e.g. Bit copy, Sector copy...)

IIgs Softkey for...

Deja Vu (IIgs)

Mindscape Inc.

This one is not very hard to make copyable. There are two disks in the package. Disk one is the system disk 4.0 (GS/OS) and is not an essential part of the program since you can use system disk 3.2 too. The troubles start with the second disk.

Just copy the whole disk with Copy II Plus. You'll receive a read error on block $0007. With the disk editor you must go to Block $76, byte $8D. You'll find the beginning of the protection check routine there. The routine is quite large and has some complicated parts, so I am not going to explain it here, but you'll recognize it by the bytes 18 FB C2 30. Disassembled it will say:

```
CLC
XCE
REP #30
```

This is a very common way to start a routine, so be sure you find the right one. Block and offset must be correct (offset is the byte number within the block). The code above enters the IIgs emulation mode and sets all registers to 16 bits registers.

Change these bytes into A9 0F 00 6B. Disassembled this will say:

```
LDA #000F
RTL
```

Once you've written the block to disk, the program must work. Strangely enough this protection scheme looks a lot like the one on several other programs from different companies. I found a code much like this one on Shanghai, Paintworks+, Hacker II, Draw plus and Music Studio. I hope more companies will use it, since it's very easy to remove as you see.

IIgs Softkey for...

Strip Poker II

Artworks

Strip Poker for IIgs is written under ProDOS 8, and is largely a Applesoft BASIC program. This, again, makes things very easy. Copy the disk (This is usually the first step unless you want to modify the original program). Once again you'll receive a Read Error on block $0007. Although the same block number, the protection scheme surely is not the same as in Deja Vu. Now boot a ProDOS 8 disk with BASIC.SYSTEM, insert your copy and type:

BLOAD AN, A$1000	*Load file AN*
CALL -151	*Enter Monitor*
1ODB:80	*Modify byte*
BSAVE AN, A$1000	*Save file AN*

You've now completed one part of the deprotection. This means you can play with one of the girls. To enable playing with the other girl too, do exactly the same as above, but instead of AN, use the file SH.

Softkey for...

King's Quest III

Sierra

Stephen Lau in COMPUTIST #60 was wondering whether or not Sierra was dropping protection. No, that is not the case. I, too, was surprised to find Police Quest unprotected, but Space Quest II and King's Quest II and III are once again protected. The protection scheme has been improved compared to Space Quest I and King's Quest I. Cracking King's Quest III requires the following procedure:

[1] Copy the disks (Ignore read error on block $0634 on disk #1).

[2] Block edit the copy of disk #1.

Block	Byte(s)	From	To
$2A7	$182	C9	A9
	$185	F0 1E	80 21
$2A8	$109	F0 1A	EA EA

On booting the copy, you'll receive the message "IF YOU DON'T WANT TO PLAY ON THE ORIGINAL DISK, INSERT BACKUP DISK". This is exactly what the original disk does, so you completely convinced the program that you're using the original disk. Disk #2 is not protected, so the copy of it can be used without further problems.

Notes on Alien Mind

I noticed the article about Alien Mind in COMPUTIST #60. This is truly one of the hardest cases of copy-protection on 3½" disks. Alien Mind is a neat action-arcade game. Anyone who was terribly disappointed by Gauntlet (as I was) should see this program. It has no real protection like checking an unreadable block or a nibble count, but is written on disk in a non-standard format. Nevertheless, this is usually enough to stop people from copying it.

Stephen Lau suggested we convert the data from the disk to a standard format and rewrite the main program so that it could easily be copied. This is a possibility and it might be a very good solution. Personally I don't like to

rewrite the main program, not because it would be too difficult, (the solution I propose is not easy either) but because of the chance that you could mess up entry-points or couldn't rewrite parts of the program where it is not really clear as to what they do or why they are in the program in the first place. Also it would be a shame to lose the high-speed loading of the program, (startup within 3 seconds) which is a direct result of how the disk is formatted.

My suggestion is to ADD a copy utility to the program. I got the idea from a friend of mine, who did the same with Broderbund's Toyshop. He added an option that, when you press escape during booting, brings you to a copy program which copies all disks. In the case of Alien Mind, I am attempting to do the same.

For anyone out there who would like to do this also, here is all the information I have found so far.

Format

Except for tracks $ØØ and $Ø1 on disk 1, all the data is stored in large chunks of nibbles. The coding used (see below) transforms every $1ØØ bytes into $156 nibbles. The tracks are not divided in sectors. All data is put on a track in one piece. Just some sync FF's, a header and the data. The tracks vary in length.

Track	memory	disk
$Ø2-ØF	$1BØØ bytes	$2412 nibbles
$1Ø-1F	$19ØØ bytes	$2166 nibbles
$2Ø-2F	$17ØØ bytes	$1EBA nibbles
$3Ø-3F	$15ØØ bytes	$1CØE nibbles
$4Ø-4F	$12ØØ bytes	$18ØC nibbles

This is for both sides, except that on disk 2, track $ØØ and $Ø1 are the same as track $Ø2-ØF. The system of decrementing track length is a normal 3½" disk format. ProDOS also supports it, but requires the use of a look-up table in the read/write routines.

The header is D5 AA AA for all tracks except $ØØ and $Ø1 on side 1. Those tracks are normal ProDOS format (blocks) and consequently have a D5 AA 96 header. Track $Ø1, side 2, on disk 1 is different from all others. The header is D5 AA AA, but the track is only $4ØØ bytes long! This is remarkably shorter than any other track on disk. This track contains the Hi-Score list! So now we have the following situation:

Disk 1

Track	Header	Length
$ØØ (both sides)	D5 AA 96	24 blocks
$Ø1 (side one)	D5 AA 96	24 blocks
$Ø1 (side two)	D5 AA AA	$4ØØ bytes
$Ø2-4F	D5 AA AA	variable

Disk 2

$ØØ-4F	D5 AA AA	variable

The coding

The coding used on track $Ø2-4F is not standard. Normally there are three different kinds of encoding: 4&4, 5&3 and 6&2. These encodings have been or are being used by Apple (ProDOS uses 6&2). Because the drive hardware cannot just write any byte to disk, the bytes have to be encoded into nibbles.

6&2 encoding makes four nibbles from every three bytes. Three bytes are split up into three sets of six bits and three sets of two bits. With a conversion table, the 6-bit parts are converted into three disk bytes and written to disk. The 2-bit parts are put together to form another 6-bit value, which with the same table is converted into a valid disk byte and written to disk. So, four nibbles for every three bytes.

4&4 encoding is done by dividing every byte into 2 parts of 4 nibbles. Part 1 contains the even bits (Ø,2,4,6) and part 2 the odd bits (1,3,5,7). All other bits are made 1 (which forms valid disk bytes) and so the values are written to disk.

Normally, sectors with 6&2 decoding are written as first all nibbles with 6-bit information, then all nibbles with 2-bit information. Alien Mind first writes the nibble with the 2-bit information, then the corresponding 3 nibbles with 6-bit information. This is done with $FF bytes and byte $1ØØ is written with 4&4 encoding! You can see this with the nibble editor of Copy II Plus. With 6&2 encoding, three $ØØ's are encoded into four $96's. With 4&4 encoding, two $ØØ's are encoded into two $AA's. When you look at track $Ø2, side one, you'll see the header, then $154 times $96, and then two $AA's. Which mean that the first $1ØØ bytes, written to disk were $ØØ's. (This is correct, the data on that particular place is the first part of the intro-picture, which is black!)

Track $Ø1, side 2, consists of $4ØØ bytes of data completely encoded with 4&4, forming $8ØØ nibbles on disk.

Reading

Stephen Lau suggested in COMPUTIST #6Ø that you would have to make extensive smartport calls to read and write the nibbles from disk. I wish this was true, but the program addresses the Integrated Woz Machine (IWM) directly. (The IWM is described in the Apple IIgs hardware reference manual). As a result the program has a tremendous loading/writing speed, but has to handle everything like headers, sync bytes and nibble encoding and decoding itself!!

We hardly talked about track $ØØ and $Ø1 side 1, but that is where you have to start. These tracks are normal ProDOS format. They contain one file called PRODOS. This, of course, is not the file PRODOS which you can find on any other ProDOS disk. I disassembled this file using SOURCEROR from the MERLIN 8/16 program. After that, I started to analyze the program. This is a very good idea, especially when you want to use the internal read-routines.

My own copy-program is able to load any track by internal read-routines and to write syncs, header and nibbles to disk. I need to write an encoding routine to complete the program. I'm planning to write my own read-routine, which does not decode the data, so I won't need to encode it either.

Hopefully I inspired some people to start with Alien Mind. Keep us informed by writing to COMPUTIST.

Edward Teach

Softkey for...

Master Of The Lamps

Activision

Since I have submitted a few long softkeys lately, I decided to keep this one short. This is essentially the same signature check that is always used on Activision. To softkey the disk, make a fastcopy of the original. Then make the following changes:

Trk	Sct	Byte(s)	From	To
$ØØ	$ØB	$ØD	2Ø 25 A1	EA EA 18
$ØØ	$ØA	$DC	ØØ	FF

You might also like to use INIT from BAG OF TRICKS to reskew the disk to 2 ascending. It cuts the loading time in half.

Side notes

I would be interested in hearing from anyone who has put something on the Most Wanted list. I would like to assist you in "cracking". II+ and IIe software only. Send letters in care of COMPUTIST.

How about if all the thousands of readers start drumming up some more members. Lets all start posting the COMPUTIST's address and subscription info on the local BBS's. After all, this mag is now an excellent publication. Since Mr. RDEXed is nice enough to keep this mag in business, lets do our part and drive the membership up so far that the COMPUTIST will last as long as *protected* disks are around. Mr. RDEXed, let us know if, in the next few months, you see a jump in subscription requests.

I'll go you one better, I'm going to post the current subscription numbers on the editorial page so everyone can see where we're at. It costs a lot more to publish a professional looking magazine than most people think and things get pretty grim here on some days. It would be "nice" if more of us were directly involved . . . . . .RDEXed

Jeff Hurlburt

The PRODUCT MONITOR

Ratings

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

Wizardry V: Heart of the Maelstrom

by D. Bradley and A. Greenberg

$49.95 Sir-Tech

★★★★

■ Requires:

64K Apple II series
one 5¼" drive
second drive optional

Newly arrived in Llylgamyn, you and your hearty band are sitting around a table in Gilgamesh's Tavern conversing in low tones, when a stranger approaches and offers to buy a round of drinks. "I see you are all new here," the old one begins. Well, he might just as well have said: "I see you fellows just rolled off the turnip cart", so fantastic is his tale. Supposedly, for reasons of her own, a renegade mage known as "The Sorn" has unstoppered a Gate separating The Elemental Forces and, thereby, created a vortex which threatens to plunge the universe into utter chaos. Someone (?!) must penetrate an already warped multi-level "Maelstrom" maze beneath the Brotherhood's Temple (just outside town), defeat The Sorn, and free the Gatekeeper before ALL is lost!!! Pure blatherscafe, of course. Still, the stranger did mention "pools of gold"; and it might be fun to poke around the old place for a day or two, before looking for a REAL adventure.

Fifth in a series dating back to the earliest days of swords and sorcery Apple gaming, "Heart of the Maelstrom" is also the first Wizardry scenario in years to be entirely self-contained. You CAN bring in advanced characters from earlier quests; but you don't have to. Indeed, creating and developing the members of your " 'Maelstrom" party is much of the fun. (If you have powerful Wizardry veterans, it's probably best to add them to the Roster as potential rescuers; or, for continuity, pick one of your oldtimers to lead the new group.) Remarkably, " 'Maelstrom" imposes almost no 'sequel penalty'. An experienced player will have a feel for 'how Wizardry does things' and familiarity with some artifacts and spells; but a lot is new — including a new magic system (with forty new spells for attack, defense, healing, scrying, transportation, etc.), enhanced combat, new character abilities, ... AND a much BIGGER maze loaded with more puzzles, nifty artifacts, tantalizing obstacles, and eccentric personages than ever. For series newcomers, this is the perfect starting point.

A Wizardry hallmark is the exceptionally detailed definition of characters and that, in the course of the adventure, differences in race, key attributes, skills, experience, and possessions really do matter. Individualization begins during creation, where a 'random' dice roll for your new human, hobbit, elf, dwarf, or gnome favors one or more race attributes. Dwarves, for instance, get more Strength, gnomes start with a Piety boost, Hobbits are Luckier, etc.. Agility, I.Q., and Vitality are similarly weighted. Selecting 'orientation' (Good, Neutral, Evil) and parceling out Bonus Points, your can tailor a character just so, for specialization as a Fighter, Thief, Priest, or Mage; OR you may mix classes to obtain a Bishop (priest + mage) or fighter-mage Samurai. Later on, an advanced character may become a fighter-priest Lord or combine fighter and thief skills as a Ninja.

Crafting a tough, hard-hitting party with just the right abilities in spell casting, weapons use, swimming, detrapping, etc. is, to be sure, the meat and potatoes of SERIOUS questing. While " 'Maelstrom" allows amazing flexibility, it also challenges you with interesting, often tricky, trade-offs. A samurai, for instance, soon acquires some useful mage spells; but a pure fighter develops more rapidly in hit power and can wear heavier armor. Priests and mages acquire the more potent spells much earlier than bishops; but a bishop has some abilities in each area and is the only class which can identify the numerous "?" (unknown) weapons, and artifacts you will discover in the maze. Since Boltac (the guy who runs the trading post next to the tavern) charges a hefty fee for identifying items, a developed bishop is worth a fortune. The thief soon becomes deft at detrapping chests and, in combat, can attack from hiding; but thieves can wear only light armor. As to developing a ninja: he or she is a super fighting machine but must be "evil" and, thus, cannot serve with a priest, bishop, or lord, who must be "good".

Evidently, just about any mix of characters can become a viable party. Amulets, rings, potions, etc. allow fighter types to acquire magic (albeit, not easily); and a magic user can simulate heavy-duty weapons and armor (if he or she lives long enough to acquire the right spells). Since the maze is nicely 'leveled' for difficulty — 'easy' on Level I, rougher, the lower you go — a party can, within reasonable limits, 'pick' battles and other risks to match its current powers. Your choice is to aim for a 'most likely to succeed' party possessing a good starting mix of abilities, go for a high-challenge adventure (e.g. start with six mages), or try anything between these extremes.

Okay, so now your six questers are sitting around a table in Gilgamesh's swilling ale and telling jokes about "utter chaos". YOU, however, have read the 86-page " 'Maelstrom" manual, perused the "Myths and Muses of the Maelstrom" booklet, AND taken due note of the five diskettes (sides A-I!) included in the package. The 'Maelstrom IS big. Based upon some forty hours of exploration, it appears to run eight levels deep (one per diskette side B-I) including at least two 900-plus square levels and others two or three times larger. Adding to the impression of SIZE is a design which, while permitting elevator access to many areas, hides large sections beneath obscure stairways, shafts, chutes, and teleports. Many of these, in turn, require specific keys, tokens, strange devices, or discovery of a secret door to access. Sprinkle-in 'dark areas', several multi-level pools, gas traps, quicksand, etc., and you'd have a decent exploration challenge, even if The Sorn and her minions decided to leave for a vacation. (Not bloody likely.)

What you actually see is a full-screen (3-D perspective) forward view in standard hires showing doors and wall sections in simple white-on-black outline. Movement, via arrow or letter keys, is speedy; and, thanks to double-dot width lines, you traverse rooms and corridors where "white" is really white, not shades of green and purple. "Crisp", "clear", "easy to read", all are accurate; so, regrettably, is "bland". Happily, players can look forward to some quality artwork upon encountering 'monsters', 'friendlies', arcane machines, and other key personages and devices. Expertly drawn, the colorful figures appear as overlays on a maze background and do, indeed, dispell much of the gloom.

Where maze graphics leave a bit much 'for the imagination to fill-in', game prompts and menus try very hard to leave nothing. At Gilgamesh's or Camping in the maze, screens present detailed character information, with window overlays and menus to handle spell casting (e.g. for healing) and the trading,

equipping, using, and identification of items. Options allow travel with or without Exploration Key and Character Status overlays; and should you encounter someone willing to barter, new windows display prompts and take care of exchanges. Similarly, all messages (e.g. responses of maze personages, monster 'sounds', blow-by-blow combat results, verbose wall carvings, etc.) come neatly enclosed in variously sized 'dialogue boxes'. Everything, in fact, works so smoothly and prompting is so well thought-out that, in " 'Maelstrom", your only challenge is the adventure, not running the program.

In the course of your explorations you can expect to encounter monsters and other adversaries of every conceivable type. Giant bugs, skeletons, zombies, hostile guards, (golems, dragons, demons, evil mages, "the Beauty", "the Beast", etc., etc..) all await your party; but not, as is too often the case, with maze-drenching frequency. The 'rule' here seems to be that, if one sticks to the corridors, one is relatively free to map and explore. Also, since the game remembers where you've been — you play on write-able copies of the original diskettes — the more often the party passes through an area, the less frequent encounters become. (Good, because, when your guys are Level 25 maze berserkers, you don't want to spend time squashing low-payoff pissant monsters.)

As the major reward for your planning, astute purchases, equipment improvements, and other efforts toward party development, combats are a highlight of great quests, and " 'Maelstrom" is no exception. Buttressed by an excellent magic system and with good weapons/armor variety, battles here are among the most entertaining offered by any adventure. They can also be very, very rough. Though 'only' semi-tactical in nature (i.e. no moving around, the monsters appear and you trade blows), the great range of attack and defense options available to both sides often produces highly challenging, involved exchanges. Particularly against groups including skilled spell casters, you can bet your party's 'stuff' will be tested to the limit, sometimes, beyond! Winning a 'great battle' is, naturally, very satisfying, besides which victories yield ever better goodies and the Experience your characters need for further growth.

Considering the game's complexity, it has to be counted a near miracle that, in many hours of maze delving, I have discovered just one design weakness, a weakness 'toss-up', and only a single genuine bug. The latter is the switching, for no apparent reason, of a character's orientation from Good or Neutral to Evil. Fortunately, this is a rare occurrence, but, when it happens, your Eviled priest (bishop, mage, etc.) is disqualified from service with any Good characters. (I have notified the Sir-Tech people and will let you know how they respond.) More bothersome (you may never encounter the bug) is the game's craving for disk access. Except for moving around in the maze, virtually every action seems to be the occasion for yet another read or write to the current diskette. These are fairly speedy; but, for someone spoiled by using IIgs wares, annoying nonetheless. A pleasant surprise is that, despite the nine diskette sides, the game is entirely playable (indeed, runs faster!) with a single drive.

Clearly, the author of " 'Maelstrom" intends that your party (and you) become enmeshed in an authentic fantasy adventure--which is to say: "all is not sweetness and light". Carelessness (as in miss-spelling the name of a snare when detrapping a chest), taking 'dumb risks' (as in diving into an unknown pool without healing spells or potions near at hand), and just plain bad luck (as in equipping a weapon which turns out to be cursed) — any of these can have very serious, even deadly, consequences. I rate this tendency to 'teach by death' as a 'maybe' or 'toss-up' weakness because, usually, 'you asked for it' and because " 'Maelstrom" supplies numerous believable, playable remedies (to say nothing of options for in-maze Quick Save or restoration from a backup of your 'player disk'). In the scenario context, Temple monks can usually restore a dead character (for a hefty fee), advanced priests acquire powerful resurrection spells; and, should your entire party perish in the bowels of the maze, there is always the option of sending in a rescue squad (armed with body locator spells) to carry them out. 'Playing it straight', then, almost certainly means a longer, more arduous quest, if only because you must plan upon developing four or five additional (reserve) characters.

No one, not even a reviewer, spends whole evenings of leisure time playing a game he or she doesn't enjoy. Absence of state-of-the-art graphics and sound notwithstanding, Sir-Tech's claim to "setting a new standard for role play fantasy adventuring" may be entirely justified. Certainly, the game is absolutely packed with fascinating places and people ("the girls" at Manfretti's nightclub, a "Mad Stomper", the "Ruby Warlock", etc.). Every excursion, it seems, uncovers new puzzles, runes, clues, and odd little machines; and any conversation can launch your party upon yet another mini-quest. (So far, no one has asked for a broom from the Wicked Witch; but one old priest has insisted I bring him an "ornate staff".) Super-addictive and good for many, many evenings of fun, "Heart of the Maelstrom" is 'the stuff REAL adventures are made of'.

FAST FRAMES, UPDATES, ETC.

Fixing the bug

If playing the game on a IIgs, you can fix a character messed around by the orientation bug mentioned in the review. Having installed "Diversi Hack" or a comparable CDA, start the game and go to "Camp" with your 'eviled' character. Now enter the monitor and find the character (look for his/her name) somewhere in the $9000-$9FFF block. Find the offending "11" in one of a few isolated bytes following the name and (if present) password. Change it to "01" for "good" or "10" for "neutral", exit the monitor; and viola!, "evil" is vanquished. Leaving the maze writes the restored character to disk and he/she can now join your party. (Incidentally, Rob Hall's "Wizardry" stuff in Computist #40 is still a useful guide to character format. A few things seem to be changed; but place values for Gold and Experience bytes remain valid.)

In the Lore Library

"Wizardry V" 's manual offers a few helpful hints for mapping; but, predictably, very little specifics about starting coordinates and size. While I can't offer any guarantees, the following (currently known) coordinate range listings should help avoid much bothersome cutting and taping:

Level 1	1W-31E	10S-31N
Level 2	18W-15E	17S-14N
Level 3	4W-28E	30S-11N
Level 4	3E-55E	11S-5N
Level 5	25W-16E	33S-24N
Level 6	16W-26E	35S-4N
Levels 7 -	???	???

When generating new characters at the "Training Grounds", you will notice that the attributes dice roller usually delivers totals in the middle 50's. Don't stand for it! With persistence, you can get up to 69 and, thus, have a much better character.

For IIgs users, a more powerful alternative to restoring lost characters from disk is to employ Roger Wagner's "SoftSwitch" as a kind of 'Time Warp' spell. Known, among IIe/IIc types, as the "CCT" (for "craven, cowardly take-back"), this ploy greatly reduces risks, perhaps too much so. An SS user might consider limiting the number of Time Warps to some pre-set value, such as the 'level' of his/her weakest character.

Best New Stuff

As I was preparing to tabulate the results of the "Best New Stuff" vote, a sysop friend expressed an interest in putting the ballot on his BB. Figuring, "the more votes, the better", I agreed and, so, have put off publishing the results. Winners, however, have been drawn and notified.

Vendors

SIR-TECH: P.O. Box 245, Charlestown Mall, Ogdensburg, NY 13669 (315-393-6633)

Ronald E. Riggs

Convert Appleworks file to DOS 3.3 text file

I would like to answer Donald Jones's question on how to change an AppleWorks file to a DOS 3.3 text file.

First type in or load your AppleWorks file into AppleWorks. When you are finished, instead of saving the file, "Print" it to an ASCII file on disk. This saves steps later and prevents AppleWorks from inserting control codes into the file. Use a blank ProDOS disk and put only the files you want to convert on it. Quit AppleWorks and boot the ProDOS users disk or IIc Utilities disk. Using CONVERT (or the "Change a disk's format" from the Advanced Operations selection on the IIc Utilities) copy the ProDOS text files to a DOS 3.3 disk, use a blank disk here also because all other data will be erased. And there you have it, a DOS 3.3 disk with your AppleWorks created files. You may now read them in to a DOS 3.3 word processor or mail the disk to COMPUTIST. I created this letter to send to COMPUTIST in just this manner.

Some word processors save their files in a binary form. Here is a way to convert them for use in AppleWorks. I converted the DOC files on the COMPUTIST Starter Kit disk like this:

Use Copy II Plus (or any file copier. FID will work) to isolate the file(s) on an otherwise blank DOS 3.3 disk. Use CONVERT as above except change the files to ProDOS. Get into BASIC under ProDOS and at the prompt type:

CREATE *filename*, **TTXT**

Where *filename* is a name different than the BIN file. Do this for each file. CATALOG (not CAT) the disk and you should see your BIN files and a corresponding TXT file. While you are there write down the ENDFILE number of each BIN file, this is the file length in decimal. Now type:

BLOAD *BIN filename*, **A$2000**

Where *BIN filename* is the name of the BIN file.

Next type:

BSAVE *filename*, **A$2000**, **L** *endfile #*, **TTXT**

Where *filename* is the name used in the create operation and *endfile #* is the ENDFILE number from the BIN file. Repeat this for each file.

The files may now be loaded into AppleWorks from the word processor menu by selecting "2. From a text (ASCII) file.". Before booting AppleWorks make sure you know the pathname of your files, AppleWorks asks for this when you try to load the text file.

(?) And now I have a question; How do you make DOS 3.3 use a binary file as a HELLO program? I ran into this problem while trying to put a fast DOS on some disks. If I am forced to use an Applesoft program to BRUN the binary program the boot process in not greatly enhanced.

The DOS must be patched and a new disk INITed in order for the hello program to be binary. "POKE 4Ø514,52" (That's $9E42:34 from the monitor) and INIT your disk. That's all. You would use 2Ø ($14) to EXEC a text file. . . . RDEXed

Bob Igo

Editor Creator II

In the past, I have gone through the tedious tasks of either booting up a sector-editor to make byte changes manually or making editor programs from scratch for games like Seadragon, Rescue Raiders, Sword of Kadash, etc. This is why I developed Editor Creator. Version two has just been perfected and here it is.

Using this program, you enter the edits you wish to make, name them, verify them as on/off or number values, and give the name of the game you are editing. Then, sit back and watch the drive spin. After it has stopped, it will have made an EXECutable textfile as does Controller Writer. To install the editor you made, type "EXEC (filename)". This will load the main program (EDIT.MAIN), type in the variable lines for you and run the editor. So, by having a main program with non-changing lines and a textfile which installs the variable ones and merges the two programs, much space is saved. It works much like Super IOB.

It uses DOS Utility from COMPUTIST #54, p.9 (thanks, Keith!), so everybody should have it or be able to back-order it.

Notes about EC II

The program asks how many aspects of the game you will be changing. An aspect is something like unlimited bullets, disable enemy tanks, and stuff like that.

When asked how many sector-edits are needed for an aspect, enter the total number of byte changes that pertain to the aspect. To make it easier for many byte changes on the same sector, default values are given. Press RETURN to accept them, or you may enter your own values.

If you like this program, let me know. I am considering making a generic editor program for adventure games. If I feel there is a need, I'll try it.

Oh, and for you beginners, please pay no attention to line 56Ø.

```
1Ø INVERSE
2Ø TEXT : HOME :A$ = "EDITOR^CREATOR^II" : HTAB
   (4Ø - LEN (A$)) / 2: FOR L = 1 TO LEN (A$):
   PRINT MID$ (A$,L,1);: X = PEEK ( - 16336): X
   = PEEK ( - 16336): NEXT
3Ø VTAB 2: HTAB 1: FOR L = 1 TO 2Ø: PRINT "-^";: X
   = PEEK ( - 16336): NEXT : POKE 34,3: HOME
4Ø NORMAL
5Ø PRINT "DO^YOU^NEED^TO^CREATE^THE^PROGRAM,^
   ^^^^^EDIT.MAIN^?";: GET OO$: PRINT OO$: IF
   OO$ = "N" THEN 8Ø
6Ø IF OO$ <> "Y" THEN CALL - 198: VTAB 4: GOTO 5Ø
7Ø NA$ = "EDIT" : GOTO 31Ø
8Ø HOME : PRINT "ENTER^ALL^TRACK,^SECTOR,^
   BYTES,^AND^BYTECHANGES^AS^ONE^OR^
   TWO-BYTE^HEX^NUMBERS."
9Ø VTAB 8: PRINT "HOW^MANY^ASPECTS^OF^THE^GAME^
   WILL^YOU^BECHANGING";: INPUT X$: X = VAL
   (X$): IF X = Ø THEN CALL - 198: GOTO 9Ø
1ØØ DIM A(X),NA$(X),OO(X),TR$(X,3Ø),SE$(X,
   3Ø),BY$(X,3Ø),FR$(X,3Ø),TU$(X,3Ø)
11Ø FOR L = 1 TO X: HOME
12Ø VTAB 4: PRINT "HOW^MANY^SECTOR-EDITS^ARE^
   NECESSARY^FOR^ASPECT^#" L;: INPUT A(L):
   IF A(L) = Ø THEN CALL - 198: GOTO 12Ø
13Ø FOR E = 1 TO A(L): PRINT "PRESS^RETURN^ALONE^
   FOR^DEFAULT^VALUES." : INVERSE : PRINT
   "EDIT^#" E ":" : NORMAL : PRINT "TRACK: ("
   ;TR$(L,E - 1) ")";: HTAB 11: GOSUB 89Ø: IF
   X$ = "" THEN TR$(L,E) = TR$(L,E - 1): GOTO
   15Ø
14Ø TR$(L,E) = X$
15Ø PRINT "SECTOR: (";SE$(L,E - 1) ")";: HTAB
   12: GOSUB 89Ø: IF X$ = "" THEN SE$(L,E) =
   SE$(L,E - 1): GOTO 17Ø
16Ø SE$(L,E) = X$
17Ø PRINT "BYTE: (";BY$(L,E - 1) ")";: HTAB 1Ø:
   GOSUB 89Ø: IF X$ = "" THEN BY$(L,E) =
   BY$(L,E - 1): GOTO 19Ø
18Ø BY$(L,E) = X$
19Ø PRINT "FROM: (";FR$(L,E - 1) ")";: HTAB 1Ø:
   GOSUB 89Ø: IF X$ = "" THEN FR$(L,E) =
   FR$(L,E - 1): GOTO 21Ø
2ØØ FR$(L,E) = X$
21Ø PRINT "TO: (";TU$(L,E - 1) ")";: HTAB 8:
   GOSUB 89Ø: IF X$ = "" THEN TU$(L,E) =
   TU$(L,E - 1): GOTO 23Ø
22Ø TU$(L,E) = X$
23Ø NEXT : PRINT : PRINT "WHAT^WILL^YOU^CALL^
   THIS^ASPECT?" : PRINT "(SUCH^AS:^TOGGLE^
   UNLIMITED^BULLETS)" : INPUT "ANSWER:^^"
   ;NA$(L)
24Ø PRINT : PRINT "IS^THIS^ASPECT^(1)^ON^OR^
   OFF," : PRINT "OR^(2)^A^NUMBER^VALUE^?";:
   GET OO$: PRINT OO$: OO(L) = VAL (OO$): IF
   OO(L) < 1 OR OO(L) > 2 THEN CALL - 198: GOTO
   24Ø
25Ø NEXT
```

```
260 HOME : VTAB 13: HTAB 1: PRINT "WORKING^ON^HEX^
    CONVERSIONS" ; : FOR L = 1 TO X: FOR E = 1 TO
    A(L)
270 H$ = TR$(L,E): GOSUB 840: TR$(L,E) = D$: H$ =
    SE$(L,E): GOSUB 840: SE$(L,E) = D$: H$ =
    BY$(L,E): GOSUB 840: BY$(L,E) = D$: H$ =
    FR$(L,E): GOSUB 840: FR$(L,E) = D$: H$ =
    TU$(L,E): GOSUB 840: TU$(L,E) = D$
280 NEXT : PRINT "." ; : CL = PEEK ( - 16336): CL =
    PEEK ( - 16336): NEXT
290 REM --DOS UTILITY NEEDED (#54, P.9)--
300 HOME : PRINT "WHAT^ WILL^ YOU^ CALL^ THIS^
    EDITOR" : INPUT NA$: HOME
310 PRINT CHR$ (4) "MONICO"
320 PRINT CHR$ (4) "OPEN" NA$: PRINT CHR$ (4)
    "WRITE" NA$
330 Q$ = CHR$ (34)
340 IF NA$ < > "EDIT" THEN 710
350 PRINT "NEW"
360 PRINT "90ONERRGOTO390"
370 PRINT "100IFPEEK(768)<>169THEN?CHR$(4)"
    Q$ "BLOADDOS^UTILITY" Q$
380 PRINT "110HOME:TR=784:SE=789:RW=794:R=
    1:W=2:POKE799,0:POKE804,32:A=8192:P=
    768:POKE774,96:POKE779,1"
390 PRINT "130READX:FORL=1TOX:READO$(L),
    N(L)"
400 PRINT "140NEXT"
410 PRINT "160FORL=1TOX:FORN=1TON(L)"
420 PRINT "170READT(L,N):READS(L,N):READBY
    (L,N):READFR(L,N):READTU(L,N):READ
    OO(L):POKERW,R:POKETR,T(L,N):POKESE,S
    (L,N):CALLP"
430 PRINT "180IFPEEK(A+BY(L,N))=FR(L,N)AND
    OO(L)=1THENC$(L)=" Q$ "OFF" Q$ ":GOTO210"
440 PRINT "190IFPEEK(A+BY(L,N))=TU(L,N)AND
    OO(L)=1THENC$(L)=" Q$ "ON^" Q$ ":GOTO210"
450 PRINT "200C$(L)=STR$(PEEK(A+BY(L,N)))"
460 PRINT "210NEXT:NEXT"
470 PRINT "220HOME:?" Q$ "OPTIONS:" Q$
    ":HTAB5:?" Q$ "PRESS^1-" Q$ "X" Q$ "^OR^'S'^
    TO^SAVE."
480 PRINT "230?:FORL=1TOX:VTABL+3:INVERSE:
    ?C$(L);:NORMAL:HTAB5:?L" Q$ ")^ " Q$
    ";O$(L):NEXT:?:?"
490 PRINT "240INPUT" Q$ "CHOICE:^" Q$ ";C$"
500 PRINT "250C=VAL(C$):IFNOT(C$=" Q$ "S" Q$
    "OR(C>0ANDC<=X))THENCALL-198:VTABX+6
    :GOTO240"
510 PRINT "260IFC$=" Q$ "S" Q$ "THEN300"
520 PRINT "270IFC$(C)=" Q$ "OFF" Q$
    "THENC$(C)=" Q$ "ON^" Q$ ":GOTO291"
530 PRINT "280IFC$(C)=" Q$ "ON^ " Q$
    "THENC$(C)=" Q$ "OFF" Q$ ":GOTO291"
540 PRINT "290?" Q$ "ENTER^NEW^" Q$ "O$(C)" Q$
    ":" Q$ ":INPUTC$(C):VTABC+3:?" Q$ "^^^^" Q$
    ":POKE34,X+6:HOME:POKE34,0:GOTO291"
550 PRINT "291INVERSE:VTABC+3:?C$(C):NORMAL:
    VTABX+6:GOTO240"
560 PRINT "300?" Q$ "DO^" Q$ ";:INVERSE:?" Q$
    "NOT" Q$ ";:NORMAL:?" Q$ "^REMOVE^THE^DISK^
    OR" Q$ ":?" Q$ "YOUR^ COMPUTER^ COULD^
    EXPLODE." Q$
570 PRINT "310FORL=1TOX"
580 PRINT "320FORN=1TON(L)"
590 PRINT "330POKERW,R:POKETR,T(L,N):POKESE,
    S(L,N):CALLP"
600 PRINT "340IFC$(L)=" Q$ "ON^ " Q$
    "THENPOKEA+BY(L,N),TU(L,N)"
610 PRINT "350IFC$(L)=" Q$ "OFF" Q$
    "THENPOKEA+BY(L,N),FR(L,N)"
620 PRINT "360IFOO(L)=2THENPOKEA+BY(L,N),VAL
    (C$(L))"
630 PRINT "370POKERW,W:CALLP:NEXT:NEXT"
640 PRINT "380VTAB23:?" Q$ "DONE." Q$ ":?" Q$
    "PRESS^ANY^KEY" Q$ ":GETG$:?:RUN"
650 PRINT "390?" Q$ "YOU^ GOOFED!!" Q$
    ":?:CALL-198:?" Q$ "ERROR^ #" Q$
    "PEEK(222):END"
660 PRINT "SAVE^EDIT.MAIN"
670 PRINT "HOME:?" Q$ "EDIT.MAIN^ HAS^ BEEN^
    ENTERED^AND^SAVED." Q$
680 PRINT "DELETE^EDIT"
690 PRINT CHR$ (4) "CLOSE"
700 HOME : PRINT "TYPE^'EXEC^EDIT'^TO^INSTALL"
    : PRINT "THE^ BASIC^ PROGRAM." : GET G$:
    PRINT : GOTO 80
710 PRINT "NEW"
720 PRINT "LOADEDIT.MAIN"
730 PRINT "400DATA" X
740 PRINT "120DIMA(" X "),NA$(" X "),OO(" X
    "),T(" X ",30),S(" X ",30),BY(" X
    ",30),FR(" X ",30),TU(" X ",30),O$(" L
    "),N(" L "),C$(" L ")"
750 PRINT "150TEXT:HOME:?" Q$ "INSERT^'" NA$ "'^
    AT^DRIVE^1" Q$ ":?" Q$ "AND^PRESS^A^KEY."
    Q$ ":GETG$:?"
760 LN = 410: FOR L = 1 TO X: PRINT LN "DATA" ;:
    PRINT NA$(L) "," A(L):LN = LN + 10: NEXT
770 PRINT :LN = 1010
780 FOR L = 1 TO X: FOR E = 1 TO A(L):LN = LN + 10:
    PRINT LN "DATA" TR$(L,E) "," SE$(L,E) ","
    BY$(L,E) "," FR$(L,E) "," TU$(L,E) ","
    OO(L)
790 NEXT E: NEXT L
800 PRINT "RUN"
810 PRINT CHR$ (4) "CLOSE"
820 PRINT CHR$ (4) "NOMONICO"
830 HOME : VTAB 23: PRINT "DONE." : PRINT "PRESS^
    ANY^KEY" : GET G$: PRINT : RUN
840 IF LEN (H$) < 2 THEN H$ = "0" + H$
850 DE = 0:HE$ = "0123456789ABCDEF" :H1$ = LEFT$
    (H$,1):MP = 16: GOSUB 860:H1$ = RIGHT$
    (H$,1):MP = 1: GOSUB 860: RETURN
860 FOR P = 1 TO 16
870 H2$ = MID$ (HE$,P,1): IF H1$ = H2$ THEN DE =
    DE + ((P - 1) * MP):D$ = STR$ (DE): RETURN
880 NEXT
890 INPUT "" ;X$: RETURN
```

Checksums

```
10  - $964B      460 - $A7BB
20  - $82DF      470 - $076B
30  - $0ECD      480 - $AE42
40  - $B4A6      490 - $26E4
50  - $2010      500 - $29F4
60  - $479D      510 - $3231
70  - $DE95      520 - $ADE2
80  - $24DB      530 - $DD65
90  - $2B1D      540 - $2507
100 - $B607      550 - $5CE0
110 - $00CA      560 - $CC85
120 - $1E06      570 - $F1B8
130 - $56D4      580 - $6584
140 - $CA1D      590 - $E665
150 - $3220      600 - $0CD5
160 - $B23D      610 - $DA7D
170 - $7826      620 - $157E
180 - $AF1B      630 - $DCB0
190 - $2815      640 - $B8E5
200 - $FF84      650 - $01B8
210 - $245A      660 - $9B0C
220 - $D568      670 - $9FF9
230 - $52B2      680 - $45C0
240 - $C494      690 - $45F5
250 - $8E34      700 - $4757
260 - $A580      710 - $523F
270 - $CA9D      720 - $C443
280 - $F9F9      730 - $A494
290 - $ED62      740 - $1668
300 - $235A      750 - $FF41
310 - $3FC1      760 - $7972
320 - $1B22      770 - $C736
330 - $3275      780 - $50D6
340 - $B85B      790 - $04FD
350 - $C000      800 - $9BD6
360 - $E34F      810 - $FE97
370 - $2B29      820 - $9C65
380 - $A133      830 - $C5BF
390 - $8A63      840 - $7830
400 - $D0EA      850 - $C61F
410 - $8938      860 - $BE4E
420 - $B2F5      870 - $056E
430 - $087A      880 - $BB57
440 - $5E2F      890 - $7B50
450 - $487B
```

Creating your own APT

With all the emphasis on cracking techniques, no one seems to wonder how people come up with APT's. In this article, I will attempt to explain some procedures I use and hopefully stimulate the readership to try them on their favorite games.

The Problem

On DeathSword, you are given two options by which to play the game. The first is just to fight all the barbarians you can until you die or to fight someone using the keyboard. The second, the main object of the game, takes you through various settings to fight eight barbarians (scenes numbered 00-07) until you finally get to Drax, the evil wizard. Maybe you're a better player than I am, but I got frustrated with spending 30 minutes+ fighting various Conan sorts just to have Drax kill me with two little

fireballs in seconds. So, I set out to find where the number of hits were stored in order to NOP (stands for No OPeration, the ever-popular EA opcode of so many APT's) all access to it.

Because you have twelve (12) hits before you die, I searched my limited knowledge of good old 65Ø2 assembly language and thought, "Hmm... 12 decimal is $ØC in hex... And in order to store that value in a location for decrementing (DEC in assembly language) each time you got hit, you must load it into either the Accumulator (LDA #$ØC, or A9 ØC), the X-register (LDX #$ØC, or A2 ØC), or the Y-register (LDY #$ØC, or AØ ØC)." The # sign before the $ sign for hex means loading directly. Loading directly is like taking the number of the house instead of what number is inside the house. "LDA $ØC" puts the value, which is in location $ØC, into the Accumulator. LDA #$ØC puts the number $ØC DIRECTly into the Accumulator. Those numbers in parentheses after the load command operands are opcodes. If you do a monitor listing of a program and you see something like RTS on the right, you will see the number 6Ø on the left. This is what the computer reads for the instruction (machine language), not the operand, which is the nice thing for us humans (assembly language). So, we now know that A9 ØC is the same as LDA #$ØC and A2 ØC is the same as LDX #$ØC and LDY #$ØC is the same as AØ ØC. We need to know this for our sector-editor search which will be described later.

"WHAT? I don't know any assembly language! How am I, a BASIC progammer (or just a plain old USER), supposed to hack through someone's code just to cheat on a game? Let someone else do it."

First of all, I just taught you most of the assembly language you'll need in this endeavor. Second of all, it's that kind of attitude which makes reader-based magazines like COMPUTIST go bankrupt. Try it first and see if you feel like taking that old sledge hammer to your monitor. If you do, forget where you read this. If not, you've just come up with a useful APT to send in to COMPUTIST and get your name in print!

The Code Hacking

For DeathSword (hereafter referred to as DS), this part was terribly easy. For other games, where you may find erroneous code, or code that may not really be part of the program you're interested in, it could mean many hours of work. In any case, there are several steps to follow. I assume you own Copy II+. If not, you may use another like utility,but Copy II+ is by far the best (in my opinion). Remember to use a backup of the game for the following procedures. Even pros mess up every now and then.

1) If possible, catalog the disk and look at the file names. You can shorten your search by eliminating sectors which contain files such as TITLE.PIC, STARTUP or HELLO, and other obvious things like that. On DS, the only file I saw that looked like it might hold some nice code was the file, DEATH.SWORD. Kind of a dead giveaway, wasn't it?

2) Next, with the name(s) of the file(s) you've selected written down in the best organizational fashion on the back of a disk jacket somewhere (No, just kidding, but do write them down.), go to the DISK MAP option. Use the arrow keys to get to the file you've selected to search. Write down the starting track and sector of the file and the ending track and sector. This will save much time, because you won't have to scan through the other files which have nothing to do with the main function of the game. In the case of DS, I found the file, DEATH.SWORD to start on track $Ø5, sector $Ø9 and end on track $Ø9, sector $Ø6. Do this for all of the files you selected to search. Not all games will be in a file-based format, so this part of the procedure doesn't always work. If not, don't worry, it's only a time-saving device.

3) Get into your sector-editor on Copy II+ and read the first track-sector configuration for the file you'll be searching. For example, on DS, I read track $Ø9, sector $Ø6 which is where the file DEATH.SWORD starts, as I found out from my disk map. Next comes your knowledge of rudimentary assembly language. Using the (S)can function, scan for (H)ex values. Remember, we're searching for the piece of code which tells the program how many lives we have. First, because the Accumulator is the most popular register to use for this sort of thing, we scan for A9 ØC, which, you will remember, are the opcodes for LDA #$ØC. If you have a game which gives you three lives, chances are the code to search for would be A9 Ø3, or LDA #$Ø3. There are rare exceptions to this rule, but we won't get into that.

The scan will stop at each location where the bytes you scanned for are. Write down all track-sector locations and what byte has the number of lives (theoretically). In DS, I found the first theoretical number of lives on track $Ø7, sector $ØØ, byte $1E. I say theoretical because we haven't yet verified that it actually is the number of lives. Keep scanning until you reach the last sector your file is on and then scan the rest of the files (if you are scanning more than one file) Usually, what I do next is to try changing the lives to a number less than normal (I used $Ø6) and write down what the old number was. (What? If you change it to $FF you should be set for a few days at least!) I do this because some games, and DS is one of them, tell you how many lives you have by a graphic representation of some sort, usually a little head or a dot. If you want to see what can happen when you mess around with numbers higher than the game was made to handle, try one of the APT's for miner 2Ø49er and set the number of lives to $FF. Dot city! Besides, this is only to find if we have the right LDA #$ØC and therefore the right stored memory location after it. This will be better explained shortly.

4) Next, with your sector-edit made, boot the game and see how many lives (or hit points in DS) you now have. If nothing has changed, restore the value to its old self (You DID write it down, didn't you?) and try the next occurence you found. If you try all occurences without success, you must then search for A2 XX (LDX #$ØC) and AØ XX (LDY #$ØC) where XX is the number of lives/hit points.

WOW! What luck! The DS edit for lives happened to be on the first sector I tried. This is wonderful! I can send it in to Compu---Wait a minute.... The bad guy has six hits, too. Hmm... I went back to Copy II+ and looked at the disassembly of the sector which I edited. It told me that the lives were being stored by using STA $4B,X (95 4B) This must mean that absolutely anything I do is going to affect both barbarians because it is using X-addressing mode. This is a technique that puts the value found at the address (which is gotten by adding the value of the X-register to $4B) into the Accumulator.

Still recovering from this shock, I scanned for any reference to $4B and found some on track $Ø7, sector $Ø8. This led me to some useless APT's, which gave both barbarians infinite hits, making each invulnerable to everything but a flying neck chop, or gave both an insta-kill ability. However, I wouldn't have brought you this far just to let you drop. The theory can still be explained even though it won't work here. Now, if we had found that location $4B held the number of hits for your barbarian and not the other, the next part would have been easy.

Note: The following doesn't actually work on DeathSword. It's here only for theory.

5) In order to decrease the value in location $4B, the game must use a DEC command (DECrement a value). So, search for all occurences of C6 4B (DEC $4B). Note the absence of a # in front of the $4B. That's because it's DECrementing location $4B, not the number $4B. If the location to be decremented were a 4-byte number instead, such as $1234, you would need to search for CE 34 12 (DEC $1234). Note the byte reversal in the number $1234 in the machine code. This is a strange quirk which probably has some higher purpose other than to annoy us, but in any case, that's the way it is.

Keep in mind, I am using $4B and $1234 only as examples as 2-byte and 4-byte locations.

6) Change all C6 4B bytes to EA EA, or, for a 4-byte location, change all CE 34 12 bytes to EA EA EA and you should have infinite hits/lives.

Not Yet Beaten

Now, since I couldn't have my cake and eat it too, I decided to go about finding the part of the program which checks the level after you've killed a barbarian to see if it's $Ø7 (or plain old 7 decimal). And if it is, load Drax in for a fight. I searched the disk for C9 Ø7 (CMP #$Ø7), which is a command which CoMPares a value in the Accumulator with a constant value ($Ø7 in this case). I found this edit to be on track $Ø7, sector $ØD. It's possible that CPY (ComPare Y, CØ Ø7) or CPX (ComPare X, EØ Ø7) could have been used instead, but here they weren't. Using the (L)ist command, I saw a BCC statement after the CMP #$Ø7. I'm not an assembly language whiz. In fact, I'm far from it. However, I do know a few opposites such as BCC and BCS, BEQ and BNE, BMI and BPL, etc. So, I changed the BCC to a BCS by changing byte $4C from $9Ø to $BØ. Now, instead of going here when the level is 7, it's goes here when the level is not 7. Because the program doesn't check here until after you've killed a barbarian, you must still fight one of them before Drax.

I hope these techniques help you aspiring APT writers out there. Sometimes, this can be just as much fun as cracking something. If you have any questions about this technique, please write to the RDEX and I'll answer them as soon as possible. Remember to send in your APT's to COMPUTIST!

A.P.T. for...

DeathSword
Epyx

Fight Drax after killing one barbarian

Trk	Sct	Byte(s)	From	To
$Ø7	$ØD	$4C	$9Ø	$BØ

Other Edits

The following are not particularly useful APT's. The first is infinite hits and the second is Insta-kill.

Trk	Sct	Byte(s)	From	To
$Ø7	$Ø8	$24	$FØ	$DØ
$Ø7	$Ø8	$28	$DØ	$FØ

In response to Donald Jones' question about Appleworks in COMPUTIST #61, you must use the print option of printing to an ASCII file on disk. After doing this, you now have a textfile version of your Appleworks letter. Then, using either Copy II+ or /PRODOS.USER, transfer your ProDOS textfile from your ProDOS disk to a DOS 3.3 disk.

(?) Has anyone with a IIe noticed that the 'e' key will sometimes strike twicee wheen you meean to strikee it oncee? Maybe I type funny, but it does really seem to repeat unexpectedly. Also, has anyone had trouble with his/her mouse, like not moving on the screen the way it used to, causing you to bang it off the desk? If so, please let me know how I can fix it. It's not just me, a few of my friends have had similar trouble.

(?) Although it's an extremely stupid game, would you please add Thunderchopper to your most wanted list? And when someone sends in the softkey, please describe the entire procedure, so I can learn from it.

Jack Moravetz

Softkey for...

Word Search 3.0
Word Match 2.0
Word Scramble 3.0
Word Choice 2.0
Hi Tech of Santa Cruz

These are ProDOS versions of earlier programs released in DOS 3.3. They are written in BASIC and compiled with the Beagle Compiler. The disk seemed to only have altered trailers as protection, but any copy made with standard trailers would not boot.

I held control-C while booting Word Search 3.Ø and was able to interrupt the program and CATalog the disk. Using the ProDOS from the copy protected disk, I was able to prefix my disk with Copy II Plus and run UTIL.SYSTEM. I was unable to successfully format a disk with Copy II Plus using this ProDOS. Not having a formatted disk to copy the files to posed a problem, so I used RAM.DRIVE from Glen Bredon's ProSEL to format my RAM. I was then able to copy the files from the protected disk to RAM.

I then booted a normal ProDOS and had to reformat the RAM with RAM.DRIVE again so that Copy II Plus would be able to read the files in RAM. I copied the files from RAM to a disk formatted with Copy II Plus. The ProDOS from the protected disk had to be replaced with a standard ProDOS. Two of the disks had the title screen in the ProDOS.

With these changes, three of the four disks ran perfectly. Word Choice 2.Ø would boot and after running the STARTUP file give a "PLACE PROGRAM DISK IN DRIVE 1" message and hang. I used BLOCK.WARDEN from ProSEL to follow the files STARTUP and MASTER.MENU. The program is compiled, but the files being accessed by the program are easily read. In the STARTUP file, I saw a BLOAD PRODOS.NS1.1, and in MASTER .MENU, I saw BRUN PRODOS.NS1.1. Since it was already BLOADed, I couldn't see a reason for it to be BRUN. I changed the bytes that would BRUN PRODOS.NS.1.1 all to EA and Word Choice 2.Ø worked perfectly also.

The bytes I found in the file MASTER. MENU were "...BRUN PRODOS.NS1.1". In hex that's:

```
1C 9A 11 42 52 55 4E 2Ø
5Ø 52 4F 44 4F 53 2E 4E
53 31 2E 31
```

Change those bytes to:

```
EA EA EA EA EA EA EA EA
EA EA EA EA EA EA EA EA
EA EA EA EA
```

Softkey for...

Scoop Mahoney
Developmental Learning Materials

Scoop Mahoney, Investigative Reader, simulates a magazine reporter on assignment for a national news magazine. Reading comprehension skills are developed while tracking down story information.

This ProDOS based program includes a two-sided program disk and a one-sided Assignments disk.

I'm not really sure how this was protected. All attempts at bit copying failed. I loaded the file STARTUP from BASIC.SYSTEM and noticed some ampersand commands and two calls. I edited a call from one line, saved the STARTUP file and had the program boot successfully.

[1] Copy all three sides with any full disk copy program.

[2] Run BASIC.SYSTEM from a ProDOS system disk and prefix the program disk

```
PREFIX/SCOOPINTRO
LOAD STARTUP
```

[3] Edit line 2Ø2Ø

Originally

```
2Ø2Ø & DATA "FNT.LINK.OBJ",12288:& DATA
"TEXT9A.FNT",A: AD = USR(LE): TB = AD: CALL
12288
```

Change to:

```
2Ø2Ø & DATA "FNT.LINK.OBJ",12288:& DATA
"TEXT9A.FNT",A: AD = USR(LE): TB = AD
```

[4] Save the file STARTUP to the disk

```
SAVE STARTUP
```

Jack R. Nissel

Softkey for...

Adventure with Fractions
Create-a-Base
Diagnostic System
E-Z Logo
Elementary - volume 8
Elementary - volume 9
Elementary - volume 10
English Parts of Speech
Estimation
Grade Manager
Graph
Graphing Primer
Growgins' Fractions
Guessing and Thinking
Keyboarding Master
Keyboarding Primer
Labels, Letters, and Lists
Logo Words and Ideas
Management System
Market Place
Mathematics volume 1
Mathematics volume 2
Mathematics volume 3
Mathematics volume 4
MECC Speller
Mind Puzzles
Number Systems
Nutrition volume 1
Nutrition volume 2
Oh, Deer!
Prime Numbers
Probability
Problem Solving Strategies
Puzzles and Posters
Sound Tracks
Study Guide
Stuff and Fetch
Writing a Narrative

MECC

■ **Requirements**

- ☐ Blank initialized disk(s) for each title
- ☐ Super IOB v1.5
- ☐ A way to reset into the monitor

All of these MECC titles can be deprotected as shown below.

[1] Create a blank slave disk(s).

```
INIT HELLO
DELETE HELLO
```

[2] Boot your original disk and at the Applesoft prompt, reset into the monitor.

[3] Move the RWTS to a safe place.

```
1900<B800.BFFFM
```

[4] Put your slave disk in the drive.

```
C600G
```

[5] Insert your Super IOB disk and save the RWTS to it.

```
BSAVE RWTS.MECC, A$1900, L$800
```

[6] Install the controller into Super IOB, run it and copy your original disk to your blank disk. Answer "NO" when asked if you want to initialize the blank disk.

Controller

```
1000 REM MECC
1010 TK = 3:ST = 0:LT = 35:CD = WR
1020 T1 = TK: GOSUB 490: GOSUB 360: ONERR GOTO
     550
1030 GOSUB 430: GOSUB 100:ST = ST + 1: IF ST < DOS
     THEN 1030
1040 IF BF THEN 1060
1050 ST = 0:TK = TK + 1: IF TK < LT THEN 1030
1060 GOSUB 490:TK = T1:ST = 0: GOSUB 360
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 : PRINT "COPY^DONE" : END
10010 PRINT CHR$ (4) "BLOAD^RWTS.MECC,A$1900"
```

Checksums

```
1000  - $356B      1060  - $20C0
1010  - $3565      1070  - $28C5
1020  - $6170      1080  - $6CA2
1030  - $7771      1090  - $9DCA
1040  - $6342      1100  - $9A4D
1050  - $ABA3      10010 - $6BE4
```

Patch Appleworks Cursor, Addendum

Here is a follow-up to my patch to change the AppleWorks cursor (COMPUTIST #60).

[1] Get into BASIC. (You can get into BASIC from any TimeOut disk or from the ProDOS system disk.)

[2] Insert a copy of your AppleWorks Startup Disk in drive 2.

```
CAT,D2
BLOAD APLWORKS.SYSTEM,TSYS,A$2000
CALL-151
2DA1:41
2DBC:A9 40 4C CB 1D
3D0G
BSAVE APLWORKS.SYSTEM,TSYS,A$2000
```

If you use UltraMacros, enter APLWORKS.SYS instead of APLWORKS.SYSTEM.

This patch will change the insert cursor to an Open-Apple and the overstrike cursor to a Solid-Apple. If you wish to reverse the Solid-Apple and Open-Apple enter 40 instead of 41 at 2DA1 and enter 41 instead of 40 at 2DBC.

I want to thank Randy Brandt for giving me the location of the overstrike cursor and the changes that were necessary.

Bob Thanski

Softkey for...

Take 1 Deluxe
Baudville

■ **Requirements**

- ☐ Apple IIe
- ☐ 1 or 2 Disk Drives
- ☐ COPYA or Copy II Plus Copy Program
- ☐ Sector Editor
- ☐ 1 Blank Disk

Recently, I read in one of the Apple magazines that Baudville has deprotected its in-house software. So I ordered Take 1 Deluxe for my Honors Chemistry classes. When the package from Baudville arrived, I tore it open and removed the Take 1 Deluxe program. It copied easily with Copy II Plus. I then booted the copy and, alas, the drive head made some horrendous grinding noises. It was obvious that copy protection remained on the update.

Scanning my library of COMPUTIST Magazines, I found Clay Harrell's softkey for the first version of Take 1 in COMPUTIST #25. Was it possible that Baudville did not change its protection? The program had not changed radically in the update.

Using Clay's lucid explanation of how the BNE instruction worked, I used my sector editor from Copy II Plus to scan for 20 44 DC (JSR $DC 44). That was the code that began the disk check for the original Take 1. I found four. Two are ignored because they have no CMP code associated with them. It is the CMP with the BNE that causes the program to loop if the proper value is not stored at location $2D.

The two BNE's that I NOPed were the two Clay had in his softkey. The disassembly follows.

At track $ØØ, sector $Ø6:

```
20 44 DC  JSR DC44
A5 2D     LDA 2D
C9 ØØ     CMP #ØØ
DØ F7     BNE ØE0A          EA these 2 bytes
```

And at track $ØØ, sector $ØF:

```
4C 2Ø 44  JMP 442Ø
DD A5 2D  JML (2DA5)
C9 FF     CMP #FF
DØ F7     BNE ØEØ1          EA these 2 bytes
```

I booted the disk after NOPing the two DØ F7's. The program did not load. I used the sector editor to find the LDA 2D (bytes A5 2D) location that had both a CMP and BNE associated with it. BINGO! It was on track $ØØ, sector $ØB. Its disassembly looks looked like this.

```
20 44 DC  JSR DC44
BØ ØB     BCS ØED2
A5 2D     LDA 2D
C9 ØF     CMP #ØF
DØ Ø5     BNE ØED2          EA these 2 bytes
```

I replaced the DØ Ø5 with 2 EA's and booted the disk. The program loaded. The disk was unprotected.

The Fast Way

[1] Copy the Take 1 disk with COPYA or Copy II Plus. The Address and Data marks are normal.

[2] Use your sector editor on track $ØØ, sector $Ø6 and search for A5 2D C9 ØØ DØ F7. Replace the DØ F7 with EA EA.

[3] Search track $ØØ, sector $ØF for DC A5 2D C9 FF DØ F7. Replace the DØ F7 with EA EA.

[4] On Track $ØØ, sector $ØB search for A5 2D C9 ØF DØ Ø5. Replace the DØ Ø5 with EA EA

Boot up your deprotected disk and enjoy the program. I have used this program with my Honors Chemistry students and they have produced some rather good movies. It helps to have the graphics disks which contain the "actors and various actions." I used Science Shape Library #2 and the Business Animation Library #3.

I know it takes time to explain how a disk is deprotected. If you, who contribute your softkeys, can explain what you do, it helps people like me to follow the logic and risk some efforts of our own. I have learned a great deal about Apple computers and how to check for protection schemes from the many contributors to COMPUTIST Magazine.

(?) I have tried the Softkey in COMPUTIST #6Ø by Doodlebug for Crossword Magic 4.Ø. The controller only reads track $ØØ through sector $ØF and then gives a DRIVE ERROR when it stops. What now?

All of you at COMPUTIST do a great job. Thanks for what you do to make it easier and better for us to deprotect our programs. Your magazine is the only one I read from cover to cover. Keep up the good work.

John E. Wanner

Questron II (Part 1) a walk-through

In COMPUTIST #61, I submitted a series of playing tips for WASTELAND. This was my first attempt at such an article and did not include several fairly important pieces of information (such as when to swap disks); this was pointed out to me by several friends who read the article.

This article will be a more ambitious undertaking, a complete walk-through of a fairly recent intermediate difficulty game, QUESTRON II. For this reason, I have game tested the instructions twice myself and had a couple of friends try to follow them, too, resulting in a few revisions. I hope the information presented here will make the game more fun and less frustrating for the reader. It is being presented in two parts. Part 1 will be devoted to building a survivable character. It will advance your alter-ego to a reasonable level and give him/her transportation good enough to avoid inconveniences of continual attacks and constant worry about food on the surface of Landor, the world of the new scenario.

QUESTRON II is the long-awaited (at least by those of us who finished the original several years ago) sequel to Questron. In this scenario, Mesron, your mentor, entrusts you, the original peacemaker of Questron, with the Evil Book of Magic and sends you back in time to the land of Landor, to destroy the Book even as it is being created. The new scenario has a larger world map than the original and has some rather nice touches of graphics, especially in the Dungeon sequences.

When Mesron's spell dissipates, you arrive in Landor S (the directions will be abbreviated) of Folman. Your first task is to get better weapons, armor and methods of travel, then to find the Hall of Visions in Redstone Castle where Mesron can communicate with you. As you may run into monsters, you should equip your weapon & armor. *Note: Each time you purchase new or sell weapons or armor, you must again equip them.* (W)ear rawhide and (A)rm dagger. Now go to Folman. Enter and go N and E to the S most unmarked booth. Buy studded leather and sell rawhide. Then (E)xit the town. Always leave town this way as it saves travel time, ie. food.

To travel in ALL parts of the map, you need rope & hooks for the mountains. Go S to Crooked Pine (2nd village) and purchase them. But, FOR NOW, travel only in the grassy areas. You're not strong enough and don't have good enough weapons to tackle other monsters.

Now improve your weapons. Go N and then W to Bay View. Enter & go E until you see 2 guards with a 2-tile path S between them. Go S and buy a hammer. *Note: Both Folman and Bay View always have the best armor & weapons (respectively) in Landor.*

Go a little farther W and then S to Santor. Wait there S of the lake (but NOT in the swamp) and bash monsters to gain gold ($). The most efficient way to do this is to hold down the (S)peak To key until a beast appears, then talk or fight as is necessary. This will save hit points and, more importantly, food, as none is used in the (S)peak mode. *Don't ever fight someone who'll talk. Don't ever buy anything outside a city unless there is very dire need--you'll get ripped off.* Fight only Antisaurs, Grub Snufflers & Ramdarts for now. You'll lose more hit points than you gain $ with others. Fight until you have a little over 5Ø HP left, enter Santor and go E to the first entry, then N. Buy HP there, (E)xit and repeat until you have your maximum (3ØØ) and about 3ØØ food (S of the HP shop).

Now, improve your lot in life. Go W until you can see the ocean and follow the coastline S to Redstone Castle. Enter and go W to the first entrance S, then to the first hall W. At the obvious doors, (U)se the gold key, go N to the funny tiles and (S)peak to Mesron. He'll give you +5 each Agility & Strength and promote you to Adventurer. (E)xit and **SAVE** here.

Now go N. If you have any extra $, stop at Seacrest (on W coast, N of the Castle) and get more HP at the unmarked shop S & E of the entrance. Then continue N to the River Crest Cathedral. Go directly to the chest in the SE corner (NOT the one behind the priest) and (L)oot it from the E corner of the N side of the chest. You get $14ØØ. Go N avoiding the guards as much as possible (*Don't fight them*) to the tomb and enter. If you started with enough HP (at least 3ØØ), you should be safe going S and E to the first chamber. (L)oot it and get the Moonstone Amulet. This will temporarily solve your food problems. (It's good for 3 charges of about 1ØØ each.) Then go back the way you came and leave the tomb--(E)xit doesn't work here--and the guards will have forgotten you. You can repeat this until you're low on HP but each time you only get half the $. It reaches a point of diminishing returns below $175.

(E)xit and bash monsters in the mountains to get below 1ØØ HP (if necessary). You then can reenter the Cathedral (you'll learn to hate the sight of this place) and visit the "Holy One". He'll now sell you Bread of Life (BL)

good for 100 HP each. Buy about 20 (he'll sell 3 at a time; (E)xit and reenter & he'll sell you more), then return to Folman for better armor ($290) and Bay View for a better weapon ($121). Now go back to, you guessed it, the Cathedral.

Your next quest is again in the tomb, but you'd better have some magic help there. This costs $$$! Wait in the pass just E of the Cathedral (use the same strategy as before) and bash monsters. The staff's efficient and your armor now absorbs much of the damage. *Even so, don't mess with Mavins, Slasher Boars, Vipods & Trolls.* They do more damage than you gain in $. The best deal is Spikers (the staff is *REALLY* good on them.) If you pay attention to what you're doing, you can make about $300-400 for each 100 HP you use. Make a little over $5000, then buy enough BL so you have about 30. (E)xit and go S and E to Long View. In town, go N and E and find the magic shop. Buy 25-30 each of Time Saps (TS) and either Magic Missiles (MM) (are more likely to work) or Fireballs (FB) (more powerful). (E)xit & go to Seacrest, to get 400 HP. Spend any extra $ on food. Now go back to the tomb again. When challanged by monsters, you can use TS to freeze them and either bash them or use MM or FB to kill, as necessary. Find Morle the Magician, looting everything in sight and fight your way back out. (You really should map the whole tomb, but to find Morle directly, follow these directions at each *INTERSECTION*--the path may also bend in between--and St means straight: E, St, St, N, N, ($200 for the blind priest), E, S through the first chamber & into the 2nd.) Get the brass key from Morle, leave the tomb & bash monsters again in the mountains to be able to resupply. Go to Redstone Castle again. **SAVE.** You're now ready for the big bucks.

Inside the castle, find a chest near the entrance *and a long, single-tile hall.* (L)oot the chest and run for the hallway, moving at least one tile inside it. (The guards only come at you one at a time this way.) Use this strategy: Wait until 2 are lined up, use TS to freeze them and MM or FB to kill. If the spell fails, use the staff. Fight until down just below 100 HP, then TS to freeze the fighting and (U)se BL to heal fast. To save HP, use the bread ONLY when the guards are frozen or you're NOT under attack. Loot *EVERYTHING*, killing all guards. You should get over $14000, emerald copper & iron keys, unicorn horn and +5 Strength. Walk out (''it's not that easy'') and **SAVE.** Your money troubles are (temporarily) over. Now, re-stock. Get at least 30 more BL, TS and FB. Also get about $300 food and go to (what, again??) the Cathedral.

You need 2 more things from the tomb: the Wand of Power (good for 3x200 HP, but save it for the endgame), and the Chalice of Arvyl. The most direct way is: Go to Morle as before, and go out the S exit, E, St, S, S, St, St, S (at the 4-way). At the end of this hall, you get the Chalice. Return to the ENTRANCE, then St, St, St, St, St, E, St, St, S, St, St, E (U)se the Emerald Key, S and get the wand. Now fight your way back to the entrance and return to the Castle. (S)peak to Mesron, get +10 Stamina and become a Scout. You may now go to the doors in the W of the castle, (U)se the brass key, get some maps for $1000 (be sure to sketch these, or screen dump to a printer if your machine has this capability) and (U)se the copper key to get the Orb of Enchantment--(L)oot it--no problem. Then go to the SW corner of the castle, (U)se the iron key and pay the gold-toothed guy $1500 to increase Charisma 10. (E)xit, re-enter & see Mesron again. You're now an Apprentice (+10 Strength). (For $3000, you can get another +5 Charisma, too.)

Now (E)xit and get better weapons and armor again, bash monsters & restock, but save $3600 or so, **SAVE** (again) at River Crest and revisit Morle. He'll send you to the Realm of Sorcerers.

In this new continent, you arrive just south of the city of Demph. By now you may have noticed that the monsters are becomming a real nuisance. They come at you in groups of 2 and really slow down travel time. In addition, if you go N & W to Burnside and get a boat, they're a real menace to navigation. You *NEED* better transportation. So, unless you *WANT* to explore the ocean & its beasties, go S and W to Grissold. E & S, you will reach a travel counter. Use your $3600 to buy a Trained Eagle. Now *YOU* can choose when to have encounters. *NOBODY* stops the Eagle. (E)xit & **SAVE.**

Questron II (Part 2)

Using what you have

In part 1, I gave a walk-through for creating a character strong enough to survive and succeed in Landor, in QUESTRON II. Now I will describe how to use that character in an efficient way to win the game. At the save-off at the end of part 1, your character had reached the rank of Apprentice, been teleported to the Realm of Sorcerers and made his/her way to Grissold to purchase a Trained Eagle. (E)xit from town and merge with your Eagle to fly away.

The Realm of Sorcerers

From Grissold, go E over water to the coast, then N to the coastal Dungeon. Go through the first two levels looting. *BE CAREFUL!!* (X)amine every 3 steps *AND AT EACH CORNER* for traps. On the third level, you will find the Scroll of Scalna. (From the first entrance I found, it was 3E, 2S, 1E, 2S, 1W to the chest.) (U)se the scroll and it MAPS as you go. Loot the whole place starting at the first level and you should get about $14000, more food, + points in several attributes, the Crystal Goblet, and Agate & Onyx keys. Go up the escape hatch on level 8 (you'll know it if you find it) and back to Mesron.

He'll tell you Cramford has troubles, but by the time you get there, everybody'll be dead, so save time. (E)xit, then re-enter the castle & go back to him. Now he'll tell you about Seacrest's woes. Go there and you'll see Mantor near the entrance. Line up a tile away and use a FB on him. He'll leave. Now go back to Mesron & get +5 Intelligence. You are now smart enough to use stronger magic. (E)xit, go 8 tiles W, then S to the Realm again and locate the Twilight Cathedral. Here you can get real discount BL in quantity. Stock up until you have 99 (the max), then go S to ''A Mighty Fortress''. Enter and loot (same strategy). You should get over $20,000, Ruby & Saphire Keys and the Eternal Flame (needed for Twilight Tomb). Leave, then return & (S)peak to King Kelfar (''YES'') & get $5000 more & +5 Stamina. Then visit Simon the Stooge (SE), pay $2000 & get +10 Intelligence. Exit and **SAVE.**

Twilight Tomb and the Endgame

Next, go to Grissold & pick up some magic, then back to the Cathedral. Your Onyx Key will open the Tomb. You can check out *ALL* the chambers, but the Black Key you need for the endgame is in the farthest SW one. (You *DID* do the maps, didn't you?) The tomb is *BIG!* Have 1500 or more food if you want to loot the whole place. With the Flame & Key, return to Mesron & become a Knight (+5 Agility, Strength & Intelligence).

Now fly back to Grissold & get Plate Mail and a Crossbow, & 30 or so sonic whines (SW) from the magic shop. You also should have 99 BL. Buy HP until you also have 5000. **SAVE.**

Fly W to the 2nd mountain chain & enter the Dungeon of Despair. (You must be a Knight & have the Black Key.) Loot & map *EACH* level. (F)ight monsters with the crossbow as they come at you and (M)agic attack those which come from the sides & behind with SW. You'll improve a couple of attributes and gain around 600 HP if you're careful. At the descent spot on level 8, (U)*se all the BL*. You should now have 15000-16000HP. Now (C)limb down to Mantor.

Mantor will immediately hit you with a mind blast. Don't waste any time--start moving. Stay along the *LEFT* wall and (F)ight the guards with the crossbow as soon as they enter the frame. *Don't use magic, it will backfire and affect you!!* Ignore Mantor's Mind Blasts for now. You can't do anything about them

anyway. When you reach Mantor, go past him, moving to the *RIGHT* wall. Follow this to the room with the funny tiles and (from a safe distance) kill all the magicians except Mantor. Enter the Circle, (U)se the book and cast the Destruct spell. Enjoy the show that follows.

John W. Cambe

After sending in my subscription fee for my second year of "COMPUTIST", I thought a comment or two might be in order.

I enjoy all the Softkeys and they have proved to be beneficial in helping to understand the DOS and ML programs. The Starter Kit included with my first subscription was well worth the money spent, with or without the magazine.

Not being into games at all, the APT's get a little carried away at times but I can live with that. It is felt that more items like "Reading from Protected Disks" by Bill Jetzer in COMPUTIST #60 would be beneficial, but I suspect they are hard to come by. I am in favor of including Mac/IBM information in COMPUTIST. The more information the better, but don't forget the II+ and IIe.

It is felt that a bug exists in your Disk Edit program. IE. When used to read track $00, sector $00 of the DOS 3.3 System Master then Buffer Disassembly is selected and printed, everything seems normal. Yet, when compared to an actual Monitor disassembly of $0800 to $XXXX, an error is noted. Branch instructions will be to $0900+ addresses, instead of $0800+. Not a big problem maybe, but for those of us that don't understand ML too well, it's a little disconcerning.

A hard copy of the two listing noted above will included for your information. Keep up the good work.

There's a simple explanation for the branch offsets being in the $900+ range, that's where the DiskEdit sector buffer is ($900-9FF). There is no easy way of knowing where the disk sector that you read into the DiskEdit buffer will actually reside in memory. So when you use the binary disassemble command, the branch offsets are calulated based on the memory location of the buffer. It keeps the code simple, but you do have to remain aware of what it is doing to avoid confusion. . . . . RDEXed

Perry L. Holman

Wrath Mapper

Wrath of Denethenor is an excellent Ultima type game that has the added attraction of being unprotected. For me, it was an excellent learning adventure into graphic shapes, map files, and animation. Normally, game map files are composed of a series of values from 0 to 127 ($00 to $7F) that, when organized into rows, represent features such as walls, grass, rock, etc. WRATH MAPPER is a package of three programs that read this data and produce visually accurate maps using User Defined Characters (UDCs). UDCs are characters that have been created by defining the pin patterns used by the dot matrix printer, downloaded into the printer RAM, and substituted for normal characters during printing. For instance, the character "{" will print as the shape of a horse when the RAM characters are selected.

The first program, DEFINE, downloads 95 UDCs into the printer RAM for later use by the MAPPER and CHART programs. It will work without modification on EPSON FX and JX printers. When I reorganized the programs for submission to COMPUTIST, I consolidated all of the variables (P1$-PA$) used for printer command in lines 300-399 in each program. Each line has an accompanying REM statement explaining what the command does, so it should be easy to adapt to other printers by changing these lines to reflect the correct codes.

The MAPPER program sets up a character array that is accurate for the game being mapped. The position of the numbers in the DATA lines 2000-2070 indicates the corresponding map table value. For example, if the map table value $03 represents a wall, then the third number in the data statements should be the decimal value of the UDC created to represent a wall, i.e. 34. As written, the program will print all of the Wrath of Denethenor maps.

To use the program with other games, it is necessary to understand and change some MAPPER values. The variable NDB (Line 415) represents the number of non map table bytes at the beginning of the map file. The COPY II Plus "View Files" option will quickly give you this information. When viewed, most map files will appear like this:

```
00 20 00 01 00 00 00 00
00 00 00 00 00 3E 4F 02
etc...
```

The first four bytes in the above example are the loading address ($2000) and the file length ($1000). The next nine bytes do nothing pertinent to the map, the map table actually starts with byte number 14. So, without counting the loading address and length bytes, (which are stored in a DOS memory location, not with the map file when bloaded) the number of non data start bytes (NDB) for this file would be 9.

For example: to allow MAPPER to produce ULTIMA IV maps change the NDB value (Line 415) to 0 (415 NDB=0). Change the FL calculation (Line 435) to ignore the last 256 bytes (435 FL=(FL-256)), which on a Ultima IV map are used as shape tables and are not part of the map table itself. Delete Line 735 (There is no initial message in Ultima Maps).

The output will be slightly scrambled until the DATA Lines (2000-2070) have been properly rearranged, but the features are easily recognizeable and the map is readable (Sorry, but I finished Ultima IV quite a while ago and didn't really feel like revisiting Britannia to verify the map features). I have also produced Moebius maps with this utility.

The third program, CHART, simply produces a printout of the user defined characters used and what they represent. The first time you use MAPPER, I recommend you select the chart option from the main menu after printing your first map. Although I tried to develope UDCs that are visually accurate, (the horse really does look like a horse, mostly...) there are limitations with a nine pin print head. The CHART program will help to interpret the map.

I hope you enjoy the program and would appreciate hearing about any modifications/ enhancements that will broaden its application. Surely the subscribers who came up with Super IOB can develop a general purpose Super MAPPER.

```
10 REM * DEFINE
20 REM * CHARACTER DEFINITION UTILITY
25 REM * BY PERRY L. HOLMAN NOV/1988
30 REM *
40 ONERR GOTO 50
45 PRINT : PRINT CHR$ (4); "MAXFILES^1"
48 GOTO 500: REM MAIN DRIVER
50 REM ERROR HANDLER
55 PRINT CHR$ (4); "PR#0"
60 HOME : VTAB 5: PRINT TAB( 10) "An^Error^had^
     Occurred!"
65 PRINT : PRINT TAB( 10) "The^Error^Code^Was:^
     " ; PEEK (222)
70 ER = PEEK (218) + ( PEEK (219) * 256)
75 PRINT : PRINT TAB( 10) "on^Line^Number:^" ;ER
80 END
100 REM VARIABLE ASSIGNMENTS
105 D$ = CHR$ (13) + CHR$ (4)
110 P1$ = CHR$ (9) + "80N" : REM SET MAXIMUM LINE
     LENGTH
115 P2$ = CHR$ (27) + ":" + CHR$ (0) + CHR$ (0) +
     CHR$ (0) : REM COPY ROM CHARS TO RAM
120 P3$ = CHR$ (27) + "%" + CHR$ (0) + CHR$ (0) :
     REM ACTIVATE ROM CHARS
125 P4$ = CHR$ (27) + "%" + CHR$ (1) + CHR$ (0) :
     REM ACTIVATE RAM CHARS
130 P5$ = CHR$ (27) + "&" + CHR$ (0) + CHR$ (32)
     + CHR$ (126) : REM DEFINE CHARS 32-126
135 P6$ = CHR$ (15) : REM CONDENSED MODE
140 P7$ = CHR$ (27) + "1" : REM 7 DOT LINE SPACING
145 P8$ = CHR$ (27) + "2" : REM NORMAL 12 DOT LINE
     SPACING
150 P9$ = CHR$ (12) : REM FORM FEED
155 PA$ = CHR$ (18) : REM CANCEL CONDENSED MODE
195 RETURN
```

```
200 REM ONE MOMENT
210 HOME : VTAB 10: PRINT TAB( 9) "One^Moment^
    Please.."
220 RETURN
300 REM DEFINE CHARACTERS
305 PRINT P5$;
310 FOR X1 = 1 TO 95
315 PRINT CHR$ (10);
320 FOR X2 = 1 TO 11
325 READ CH: PRINT CHR$ (CH);
330 NEXT X2
335 NEXT X1
340 PRINT
345 RETURN
400 REM PRINT DEFINED CHARACTERS
405 PRINT D$; "PR#1"
410 IF LN > 80 THEN PRINT PA$: REM CANCEL
    CONDENSED
415 PRINT CHR$ (25); "ØN"
420 PRINT P4$;: REM ACTIVATE RAM
425 CH = 32
430 LC = 50: GOSUB 455
435 LC = 45: GOSUB 455
440 PRINT P3$: REM ACTIVATE ROM
445 PRINT P9$: REM FORM FEED
450 RETURN
455 FOR X1 = 1 TO LC
460 PRINT CHR$ (CH);
465 CH = CH + 1
470 NEXT X1
475 PRINT CHR$ (13)
480 RETURN
500 REM MAIN DRIVER
505 RESTORE
510 GOSUB 100: REM VARIABLES
515 GOSUB 200: REM ONE MOMENT
520 PRINT D$; "PR#1"
525 PRINT CHR$ (9); CHR$ (25): REM CHANGE
    GRAPPLER CONTROL CODE
530 PRINT CHR$ (25); "ØN"
535 PRINT P2$: REM DOWNLOAD ROM TO RAM
540 GOSUB 300: REM DEFINE CHARACTERS
545 PRINT D$; "PR#Ø"
550 HOME : VTAB 5: PRINT TAB( 8) "PRINT^
    CHARACTERS?^(Y/N)^" ;: GET ME$
555 IF ME$ = "Y" OR ME$ = "y" THEN GOSUB 400
560 PRINT CHR$ (25); CHR$ (9)
565 PRINT D$; "PR#Ø"
570 HOME : CLEAR : END
2000 REM CHARACTER DEFINITION DATA
2032 DATA Ø,Ø,18,4,56,68,56,4,18,Ø,Ø: REM
    DIMENSION DOOR
2033 DATA Ø,30,33,2,53,Ø,53,2,33,30,Ø: REM
    SAD FACE
2034 DATA Ø,Ø,34,Ø,Ø,8,Ø,Ø,34,Ø,Ø: REM GRASS
2035 DATA Ø,30,33,4,51,Ø,51,4,33,30,Ø: REM
    HAPPY FACE
2036 DATA Ø,Ø,34,Ø,8,22,8,Ø,34,Ø,Ø: REM BRUSH
2037 DATA Ø,48,72,1,78,1,78,1,72,48,Ø: REM
    LIVE TREE
2038 DATA Ø,Ø,54,Ø,Ø,Ø,Ø,Ø,54,Ø,Ø: REM BRICK
    PATH
2039 DATA 4,8,20,40,20,40,20,40,16,32,Ø: REM
    TRAP
2040 DATA Ø,48,2,28,2,124,2,28,2,48,Ø: REM
    CASTLE
2041 DATA Ø,Ø,50,12,2,12,2,12,50,Ø,Ø: REM
    OUTPOST
2042 DATA 16,14,48,2,112,2,112,2,48,14,16:
    REM TOWN
2043 DATA Ø,Ø,Ø,16,Ø,63,Ø,16,40,16,Ø: REM AXE
2044 DATA 6,8,16,Ø,38,8,38,Ø,16,8,6: REM
    DUNGEON
2045 DATA 1,Ø,6,Ø,6,Ø,8,Ø,16,Ø,32: REM SWORD
2046 DATA Ø,Ø,127,Ø,42,Ø,42,Ø,127,Ø,Ø: REM
    LADDER
2047 DATA Ø,Ø,Ø,4,Ø,62,Ø,4,Ø,Ø,Ø: REM DAGGER
2048 DATA Ø,Ø,127,Ø,56,Ø,24,Ø,8,Ø,Ø: REM SIGN
2049 DATA Ø,48,Ø,17,14,49,78,1,16,32,Ø: REM
    DEAD TREE
2050 DATA Ø,62,Ø,62,Ø,62,Ø,14,64,46,64: REM
    STAIRS DOWN
2051 DATA Ø,2,48,10,32,95,32,10,36,Ø,Ø: REM
    TREASURE
2052 DATA Ø,Ø,16,32,7,32,4,32,24,Ø,Ø: REM
    QUESTION
2053 DATA Ø,Ø,Ø,8,20,8,20,8,Ø,Ø,Ø: REM SMALL
    BALL
2054 DATA Ø,8,Ø,8,16,Ø,8,Ø,8,Ø,Ø: REM DEEP
    WATER
2055 DATA ^Ø,Ø,18,Ø,18,36,Ø,18,Ø,18,Ø: REM
    SHALLOW WATER
2056 DATA Ø,36,18,Ø,18,36,Ø,36,18,Ø,Ø: REM
    WAVY LIGHT
2057 DATA 10,Ø,4,Ø,4,10,4,10,Ø,4,Ø: REM
    FISH#1
2058 DATA 85,Ø,85,Ø,42,Ø,42,Ø,85,Ø,85: REM
    ROCK
2059 DATA Ø,Ø,12,18,12,18,12,18,12,Ø,Ø: REM
    LARGE BALL
2060 DATA Ø,30,32,10,32,10,32,10,32,30,Ø: REM
    LOCKED DOOR
2061 DATA Ø,30,32,2,32,2,32,2,32,30,Ø: REM
    UNLOCKED DOOR
2062 DATA 127,Ø,73,Ø,73,54,73,Ø,73,Ø,127: REM
    WALL
2063 DATA Ø,28,34,28,34,Ø,34,28,34,28,Ø: REM
    PEDESTAL
2064 DATA 88,32,16,8,86,41,86,9,16,33,90: REM
    DRAGON
2065 DATA 6,9,22,9,22,9,22,9,22,1,38: REM
    TANK
2066 DATA 56,Ø,24,Ø,30,Ø,28,Ø,24,Ø,8: REM
    AIRPLANE
2067 DATA Ø,56,6,33,22,41,22,33,6,56,Ø: REM
    SHIELD
2068 DATA 6,Ø,62,Ø,96,Ø,3,Ø,31,Ø,48: REM
    MUSIC
2069 DATA 65,Ø,34,28,Ø,28,Ø,28,34,Ø,65: REM
    PIT/HOLE
2070 DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø: REM TITLE
    SPACE
2071 DATA Ø,20,Ø,20,Ø,127,Ø,20,Ø,20,Ø: REM
    FEATURE?
2072 DATA Ø,Ø,Ø,Ø,24,32,Ø,Ø,Ø,Ø,Ø: REM
    APOSTROPHE
2073 DATA Ø,Ø,62,Ø,62,Ø,34,Ø,34,Ø,34: REM
    LEFT FURN
2074 DATA Ø,Ø,15,16,36,Ø,36,16,15,Ø,Ø: REM
    LETTER A
2075 DATA 34,Ø,34,Ø,62,Ø,62,Ø,34,Ø,34: REM
    MIDDLE FURN
2076 DATA Ø,Ø,33,30,33,8,33,8,33,22,Ø: REM
    LETTER B
2077 DATA 34,Ø,34,Ø,34,Ø,62,Ø,62,Ø,Ø: REM
    RIGHT FURN
2078 DATA Ø,Ø,30,Ø,33,Ø,33,Ø,33,18,Ø: REM
    LETTER C
2079 DATA Ø,Ø,62,Ø,6,Ø,6,Ø,62,Ø,Ø: REM LOWER
    FURN
2080 DATA Ø,Ø,63,Ø,33,Ø,33,Ø,30,Ø,Ø: REM
    LETTER D
2081 DATA Ø,Ø,127,Ø,28,Ø,28,Ø,127,Ø,Ø: REM
    MIDDLE FURN
2082 DATA Ø,Ø,63,Ø,37,Ø,37,Ø,33,Ø,Ø: REM
    LETTER E
2083 DATA Ø,Ø,63,Ø,48,Ø,48,Ø,63,Ø,Ø: REM
    UPPER FURN
2084 DATA Ø,Ø,63,Ø,40,Ø,40,Ø,32,Ø,Ø: REM
    LETTER F
2085 DATA 112,8,38,9,52,9,52,9,38,8,112: REM
    DEMON
2086 DATA Ø,30,33,Ø,33,4,33,4,33,22,Ø: REM
    LETTER G
2087 DATA Ø,Ø,99,Ø,93,34,93,Ø,99,Ø,Ø: REM
    COLUMN
2088 DATA Ø,63,Ø,8,Ø,8,Ø,8,Ø,63,Ø: REM LETTER
    H
2089 DATA 20,Ø,20,Ø,28,Ø,28,Ø,20,Ø,20: REM
    HORIZ FENCE
2090 DATA Ø,Ø,33,Ø,33,30,33,Ø,33,Ø,Ø: REM
    LETTER I
2091 DATA Ø,Ø,Ø,127,Ø,28,Ø,127,Ø,Ø,Ø: REM
    VERT FENCE
2092 DATA Ø,Ø,7,32,1,32,1,62,Ø,32,Ø: REM
    LETTER J
2093 DATA 124,Ø,72,Ø,72,48,72,Ø,72,Ø,124: REM
    UPPER WALL
2094 DATA Ø,63,Ø,12,18,Ø,18,33,Ø,Ø,Ø: REM
    LETTER K
2095 DATA 31,Ø,9,Ø,9,6,9,Ø,9,Ø,31: REM LOWER
    WALL
2096 DATA Ø,Ø,63,Ø,1,Ø,1,Ø,1,Ø,Ø: REM LETTER L
2097 DATA Ø,Ø,Ø,Ø,65,Ø,127,Ø,73,Ø,127: REM
    RIGHT WALL
2098 DATA Ø,63,Ø,16,8,4,8,16,Ø,63,Ø: REM
    LETTER M
2099 DATA 127,Ø,73,Ø,127,Ø,65,Ø,Ø,Ø,Ø: REM
    LEFT WALL
2100 DATA Ø,Ø,63,Ø,16,8,4,2,Ø,63,Ø: REM
    LETTER N
2101 DATA Ø,Ø,4,48,68,11,68,48,4,Ø,Ø: REM
    ANKH
2102 DATA Ø,Ø,30,Ø,33,Ø,33,Ø,30,Ø,Ø: REM
    LETTER O
2103 DATA 16,44,18,4,42,84,42,4,18,44,16: REM
    ROYALTY
2104 DATA Ø,Ø,63,Ø,36,Ø,36,24,Ø,Ø,Ø: REM
    LETTER P
2105 DATA Ø,24,Ø,24,39,88,39,24,Ø,24,Ø: REM
    CHURCH
```

```
2106 DATA 0,0,30,33,0,37,2,33,30,1,0: REM
     LETTER Q
2107 DATA 0,0,127,0,64,32,0,44,16,12,0: REM
     MACE
2108 DATA 0,63,0,32,4,32,6,33,24,1,0: REM
     LETTER R
2109 DATA 0,64,32,76,50,76,50,73,48,64,0: REM
     TORNADO
2110 DATA 0,17,40,1,40,1,40,1,38,0,0: REM
     LETTER S
2111 DATA 0,0,0,127,0,42,0,127,0,0,0: REM
     LADDER#2
2112 DATA 0,0,32,0,32,31,32,0,32,0,0: REM
     LETTER T
2113 DATA 0,0,29,0,127,0,127,0,29,0,0: REM
     STATUE
2114 DATA 0,0,62,1,0,1,0,1,62,0,0: REM LETTER
     U
2115 DATA 0,4,8,20,43,84,43,20,8,4,0: REM
     PINE TREE
2116 DATA 0,56,4,2,0,1,0,2,4,56,0: REM LETTER
     V
2117 DATA 0,0,1,8,18,8,36,8,64,0,0: REM
     LIGHTNING
2118 DATA 0,63,0,2,4,8,4,2,0,63,0: REM LETTER
     W
2119 DATA 32,78,32,14,0,62,0,62,0,62,0: REM
     STAIRS UP
2120 DATA 0,0,33,18,4,8,4,18,33,0,0: REM
     LETTER X
2121 DATA 28,34,69,0,73,50,69,0,73,34,28: REM
     BASKETBALL
2122 DATA 0,0,32,16,8,7,8,16,32,0,0: REM
     LETTER Y
2123 DATA 6,8,7,8,4,8,20,11,52,0,16: REM
     HORSE
2124 DATA 0,0,33,2,37,0,41,16,33,0,0: REM
     LETTER Z
2125 DATA 0,4,0,9,34,92,34,9,0,4,0: REM MAN
2126 DATA 36,2,125,2,37,2,21,2,61,2,20: REM
     BOAT
```

Checksums

```
10   - $BADD
20   - $9B13
25   - $5036
30   - $A496
40   - $8375
45   - $C51F
48   - $2831
50   - $CF4E
55   - $C046
60   - $3298
65   - $08EF
70   - $101E
75   - $0263
80   - $3F04
100  - $CEE8
105  - $3993
110  - $A451
115  - $DE92
120  - $5893
125  - $5A16
130  - $D369
135  - $6775
140  - $66B5
145  - $A1BC
150  - $69E5
155  - $8003
195  - $B339
200  - $D720
210  - $329A
220  - $A340
300  - $5839
305  - $3C55
310  - $94BF
315  - $285B
320  - $4852
325  - $F592
330  - $F401
335  - $6BAF
340  - $A3C7
345  - $1566
400  - $A63D
405  - $6E4C
410  - $960C
415  - $9301
420  - $6397
425  - $5A81
430  - $DFAE
435  - $D9F3
440  - $F7C7
445  - $DACA
450  - $899A
455  - $4765
460  - $7EF7
465  - $C79D
470  - $4C34
475  - $E967
480  - $806A
500  - $A21E
505  - $3FCE
510  - $0F97
515  - $C721
520  - $08BA
525  - $DEA2
530  - $9152
535  - $0191
540  - $031E
545  - $6A1D
550  - $04AF
555  - $0CB2
560  - $BB46
565  - $D035
570  - $B25C
2000 - $43D4
2032 - $9A2A
2033 - $B8EB
2034 - $A83C
2035 - $F2FA
2036 - $C2A6
2037 - $EA3A
2038 - $A18E
2039 - $FACF
2040 - $8EF1
2041 - $2032
2042 - $BA60
2043 - $471A
2044 - $269D
2045 - $1389
2046 - $B4E5
2047 - $9899
2048 - $1034
2049 - $BE12
2050 - $5BE8
2051 - $C479
2052 - $D895
2053 - $F1C9
2054 - $61B4
2055 - $BD9E
2056 - $6BE4
2057 - $E6E3
2058 - $E626
2059 - $84E5
2060 - $71E9
2061 - $E05E
2062 - $1846
2063 - $4595
2064 - $289C
2065 - $EF22
2066 - $5A77
2067 - $D7C3
2068 - $CA7E
2069 - $B59D
2070 - $D683
2071 - $34E3
2072 - $A316
2073 - $B658
2074 - $D85F
2075 - $2D88
2076 - $C5B2
2077 - $8E90
2078 - $5947
2079 - $E28C
2080 - $5839
2081 - $9143
2082 - $6B4F
2083 - $BBF9
2084 - $6963
2085 - $1C2C
2086 - $77CA
2087 - $DA29
2088 - $C11E
2089 - $40B8
2090 - $8BFC
2091 - $F2FE
2092 - $A74A
2093 - $E365
2094 - $F082
2095 - $63C2
2096 - $ED54
2097 - $F383
2098 - $3B68
2099 - $5C97
2100 - $16DA
2101 - $0033
2102 - $ED1F
2103 - $FAE8
2104 - $B1DD
2105 - $4079
2106 - $BCDA
2107 - $6B77
2108 - $1A1E
2109 - $AB6F
2110 - $08C7
2111 - $CA04
2112 - $3C2D
2113 - $14A0
2114 - $13C7
2115 - $5C98
2116 - $9471
2117 - $7979
2118 - $DD1E
2119 - $5EE8
2120 - $FF07
2121 - $BE68
2122 - $3F9A
2123 - $04C1
2124 - $B485
2125 - $BD51
2126 - $4201
```

```
10 REM * WRATH MAPPER
20 REM * MAP PRINTING UTILITY
25 REM * BY PERRY L. HOLMAN NOV/1988
30 REM *
40 ONERR GOTO 50
45 PRINT : PRINT CHR$ (4); "MAXFILES^1"
49 GOTO 1000: REM MAIN DRIVER
50 REM ERROR HANDLER
55 PRINT CHR$ (4); "PR#0"
60 HOME : VTAB 5: PRINT TAB( 10) "An^Error^had^
     Occurred!"
65 PRINT : PRINT TAB( 10) "The^Error^Code^Was:^
     " ; PEEK (222)
70 ER = PEEK (218) + ( PEEK (219) * 256)
75 PRINT : PRINT TAB( 10) "on^Line^Number:^" ;ER
80 END
100 REM VARIABLE ASSIGNMENTS
105 D$ = CHR$ (13) + CHR$ (4)
110 P1$ = CHR$ (9) + "80N" : REM SET MAXIMUM LINE
     LENGTH
115 P2$ = CHR$ (27) + ":" + CHR$ (0) + CHR$ (0) +
     CHR$ (0): REM COPY ROM CHARS TO RAM
120 P3$ = CHR$ (27) + "%" + CHR$ (0) + CHR$ (0):
     REM ACTIVATE ROM CHARS
125 P4$ = CHR$ (27) + "%" + CHR$ (1) + CHR$ (0):
     REM ACTIVATE RAM CHARS
130 P5$ = CHR$ (27) + "&" + CHR$ (0) + CHR$ (32)
     + CHR$ (126): REM DEFINE CHARS 32-126
135 P6$ = CHR$ (15): REM CONDENSED MODE
140 P7$ = CHR$ (27) + "1" : REM 7 DOT LINE SPACING
145 P8$ = CHR$ (27) + "2" : REM NORMAL 12 DOT LINE
     SPACING
150 P9$ = CHR$ (12): REM FORM FEED
155 PA$ = CHR$ (18): REM CANCEL CONDENSED MODE
195 RETURN
200 REM ACTIVATE RAM
220 PRINT P4$;
230 RETURN
250 REM ACTIVATE ROM
260 PRINT P3$;
270 RETURN
300 REM GET FILE LENGTH
305 FL = PEEK (43616) + ( PEEK (43617) * 256)
310 RETURN
340 RETURN
350 REM GET MAP NAME
355 HOME : VTAB 9: HTAB 7: INPUT "Map^Name?:^"
     ;MAP$
360 RETURN
400 REM CALCULATE MAP PARAMETERS
405 GOSUB 350: REM GET MAP NAME
410 START = 8192
415 NDB = 186
420 ADD = (START - NDB)
422 HOME : VTAB 9: PRINT TAB( 3) "Insert^Map^Disk^
     (Drive^1):^" ;: GET ME$
425 PRINT D$; "BLOAD^" MAP$ ",A" ;ADD
430 GOSUB 300: REM GET FILE LENGTH
435 FL = (FL - NDB): REM ALLOW FOR NON DATA BYTES
440 ROW = SQR (FL)
445 LN = ROW
450 RETURN
500 REM PRINTER SETUP
505 PRINT D$; "PR#1"
```

```
510 PRINT P1$: REM SET UNLIMITED LINE LENGTH
515 IF LN > 80 THEN GOTO 530
520 GOTO 540
530 PRINT P6$: REM CONDENSED MODE
540 PRINT P7$;: REM SET LINE SPACING TO 7 DOT
545 RETURN
550 REM LOAD CHARACTER ARRAY
555 DIM CA(128)
560 FOR X1 = 0 TO 127
565 READ CA(X1)
570 NEXT X1
575 RETURN
600 REM MAIN MENU
605 HOME : VTAB 5: HTAB 15: INVERSE : PRINT "MAIN
    MENU" : NORMAL
610 VTAB 8: PRINT TAB( 12) "1=Print Maps"
615 PRINT : PRINT TAB( 12) "2=Print Chart"
620 PRINT : PRINT TAB( 12) "3=Quit Mapper"
625 VTAB 15: PRINT TAB( 10) "Your Choice (1-3)?
    " ;: GET ME$
630 ME = VAL (ME$)
635 RETURN
700 REM QUIT
705 PRINT P8$: PRINT P3$: PRINT P9$
710 PRINT CHR$ (18): REM COMPRESSED OFF
715 PRINT D$; "PR#0"
720 IF ME = 2 THEN GOTO 730
725 HOME : END
730 REM PRINT CHART
735 HOME : VTAB 9: PRINT TAB( 3) "Insert Program
    Disk (Drive 1)" ;: GET ME$
740 HOME
745 PRINT D$; "RUN CHART"
780 REM PRINTING!
785 HOME : VTAB 7: HTAB 15: FLASH : PRINT
    "PRINTING!" : NORMAL
790 VTAB 11: PRINT TAB( 10) "Press CTRL C to
    Halt"
795 RETURN
800 REM PRINT MESSAGE
805 GOSUB 250: REM ACTIVATE ROM CHARS
810 ML = 76: REM MAXIMUM MESSAGE LENGTH
815 FOR X1 = 1 TO ML
820 CR = PEEK (START - ML)
830 IF CR = 252 THEN CR = 160: REM CONVERT TO SPACE
835 PRINT CHR$ (CR);
840 START = START + 1
845 NEXT X1
850 PRINT CHR$ (13)
855 PRINT
860 RETURN
900 REM PRINT MAP
905 PRINT "Map Name: " ;MAP$; "   Rows: " ;ROW;
    "   Lines: " ;LN
910 PRINT : GOSUB 200: REM ACTIVATE RAM CHARS
912 START = 8192
915 FOR X1 = 1 TO ROW
920 FOR X2 = 1 TO LN
925 CR = PEEK (START + (X2 - 1))
930 CHAR = CA(CR)
935 PRINT CHR$ (CHAR);
945 NEXT X2
950 START = (START + LN)
965 PRINT CHR$ (13);
970 NEXT X1
975 PRINT
980 RETURN
1000 REM MAIN DRIVER
1005 GOSUB 100: REM VARIABLES
1010 GOSUB 600: REM MAIN MENU
1015 IF ME < 0 OR ME > 3 THEN POKE 49168,0: GOTO
     1000
1020 IF ME = 3 THEN GOTO 700: REM QUIT
1025 IF ME = 1 THEN GOTO 1035
1030 GOTO 730
1033 RESTORE
1035 GOSUB 400: GOSUB 780: GOSUB 500
1038 GOSUB 550
1040 GOSUB 800
1045 GOSUB 900
1050 PRINT CHR$ (18)
1055 PRINT D$; "PR#0"
1060 GOTO 1000
2000 DATA 32,33,34,35,36,37,38,39,40,41,42,
     43,44,45,46,47: REM 00-0F
2010 DATA 48,49,50,51,52,53,54,55,56,57,67,
     67,67,67,67,67: REM 10-1F
2020 DATA 64,64,64,64,64,64,64,64,65,65,65,
     65,65,65,65,65: REM 20-2F
2030 DATA 66,66,66,66,66,66,66,66,85,85,58,
     59,60,61,62,63
2040 DATA 68,68,68,68,68,69,70,71,72,73,74,
     75,76,77,78,79: REM 40-4F
2050 DATA 80,81,82,83,84,85,86,87,88,89,90,
     91,92,93,94,95: REM 50-5F
2060 DATA 96,97,98,99,100,101,102,103,104,
     105,106,107,108,109,110,111: REM 60-6F
2070 DATA 112,113,114,115,116,117,118,119,
     120,121,122,123,124,125,126,126: REM
     70-7F
```

Checksums

```
10   - $BADD      615  - $1D6C
20   - $9B13      620  - $D34C
25   - $5036      625  - $1437
30   - $A496      630  - $41A8
40   - $8375      635  - $5984
45   - $C51F      700  - $1BC8
49   - $DCAC      705  - $8BCA
50   - $8650      710  - $01D7
55   - $B5B2      715  - $89D8
60   - $6314      720  - $B8CC
65   - $9111      725  - $6CC5
70   - $5900      730  - $6E54
75   - $7797      735  - $4675
80   - $B34D      740  - $9347
100  - $C3C6      745  - $F2A5
105  - $17C2      780  - $24B4
110  - $A97F      785  - $9454
115  - $D3BC      790  - $D5C1
120  - $46E6      795  - $B663
125  - $5BDA      800  - $6A22
130  - $27F4      805  - $A2B3
135  - $66B9      810  - $97BF
140  - $A8B4      815  - $E093
145  - $3C72      820  - $457D
150  - $A57C      830  - $54D3
155  - $E537      835  - $68DA
195  - $7FA0      840  - $FEAD
200  - $4AEE      845  - $D450
220  - $2D0A      850  - $F543
230  - $636A      855  - $07FC
250  - $806B      860  - $F22E
260  - $87FE      900  - $A3F6
270  - $B525      905  - $EA02
300  - $19BD      910  - $1A82
305  - $06B1      912  - $F3EA
310  - $2E52      915  - $FF81
340  - $89E9      920  - $C2AD
350  - $CD34      925  - $1DE4
355  - $A56A      930  - $4BC8
360  - $F958      935  - $15CE
400  - $001D      945  - $82D8
405  - $25E5      950  - $9257
410  - $11A4      965  - $CE75
415  - $7ED0      970  - $7F17
420  - $0CC8      975  - $338A
422  - $E1D0      980  - $DC72
425  - $C758      1000 - $4F36
430  - $FDF4      1005 - $A66F
435  - $A268      1010 - $D380
440  - $B738      1015 - $CA42
445  - $EEA5      1020 - $E253
450  - $FAA0      1025 - $C68A
500  - $9018      1030 - $0EF1
505  - $46AD      1033 - $C491
510  - $9EF1      1035 - $D036
515  - $D6BD      1038 - $A277
520  - $4499      1040 - $D061
530  - $4CEB      1045 - $6BB8
540  - $2928      1050 - $DC71
545  - $F1D5      1055 - $CA01
550  - $261B      1060 - $94F2
555  - $2C7B      2000 - $0797
560  - $4114      2010 - $5FD3
565  - $627C      2020 - $76EE
570  - $E29E      2030 - $D1E1
575  - $BF6D      2040 - $AB81
600  - $F6DE      2050 - $DA6B
605  - $9B3D      2060 - $995C
610  - $88BA      2070 - $CDB6
```

```
0 D$ = CHR$ (13) + CHR$ (4): PRINT D$; "OPEN
    TEXT1" : PRINT D$; "DELETE TEXT1"
10 REM * CHART
20 REM * CHARACTER DEFINITION UTILITY
25 REM * BY PERRY L. HOLMAN NOV/1988
30 REM *
40 ONERR GOTO 50
45 PRINT : PRINT CHR$ (4); "MAXFILES 1"
49 GOTO 300: REM MAIN DRIVER
50 REM ERROR HANDLER
55 PRINT CHR$ (4); "PR#0"
60 HOME : VTAB 5: PRINT TAB( 10) "An Error had
    Occurred!"
65 PRINT : PRINT TAB(10) "The Error Code Was:
    " ; PEEK (222)
70 ER = PEEK (218) + ( PEEK (219) * 256)
75 PRINT : PRINT TAB( 10) "on Line Number: " ;ER
80 END
100 REM VARIABLE ASSIGNMENTS
```

```
105 D$ = CHR$ (13) + CHR$ (4)
110 P1$ = CHR$ (9) + "0N" : REM SET MAXIMUM LINE
    LENGTH
115 P2$ = CHR$ (27) + ":" + CHR$ (0) + CHR$ (0) +
    CHR$ (0) : REM COPY ROM CHARS TO RAM
120 P3$ = CHR$ (27) + "%" + CHR$ (0) + CHR$ (0) :
    REM ACTIVATE ROM CHARS
125 P4$ = CHR$ (27) + "%" + CHR$ (1) + CHR$ (0) :
    REM ACTIVATE RAM CHARS
130 P5$ = CHR$ (27) + "&" + CHR$ (0) + CHR$ (32)
    + CHR$ (126) : REM DEFINE CHARS 32-126
135 P6$ = CHR$ (15) : REM CONDENSED MODE
140 P7$ = CHR$ (27) + "1" : REM 7 DOT LINE SPACING
145 P8$ = CHR$ (27) + "2" : REM NORMAL 12 DOT LINE
    SPACING
150 P9$ = CHR$ (12) : REM FORM FEED
195 RETURN
200 REM PRINT LINES
205 FOR X2 = 1 TO LE
210 PRINT P3$;
215 PRINT SYM$(X); ":" ;
220 PRINT P4$;
225 PRINT CHR$ (CR(X));
228 PRINT CHR$ (70);
230 X = X + 1
235 NEXT X2
240 PRINT CHR$ (13)
245 RETURN
300 REM MAIN DRIVER
305 GOSUB 100: REM VARIABLES
310 D = 67: REM EASY TO CHANGE
315 DIM SYM$(D)
320 DIM CR(D)
325 FOR X = 1 TO 67
330 READ SYM$(X)
335 NEXT X
340 FOR X = 1 TO 67
345 READ CR(X)
350 NEXT X
355 PRINT D$; "PR#1"
360 PRINT P1$
365 X = 1
370 FOR X1 = 1 TO 8
375 LE = 8: GOSUB 205: REM FIRST 8 LINES
380 NEXT X1
385 LE = 3: GOSUB 205: REM LAST LINE
390 PRINT P3$
395 PRINT D$; "PR#0"
399 END
1000 DATA DIMDOOR,UNK,GRASS,UNK,BRUSH,TREE,
     BRICK,TRAP,CASTLE,OUTPOST,TOWN,UNK
1005 DATA DUNGEON,UNK,LADDER,UNK,SIGN,DEAD
     TREE,UNK,UNK,UNK,UNK,DEEPWATER,
     SHALLOWS
1010 DATA WAVYLIGHT,UNK,ROCK,UNK,DOOR
     (LOCKED),DOOR,WALL,PEDESTAL,UNK,UNK,
     UNK,UNK
1015 DATA UNK,PIT/HOLE,UNK,L-OBJ,MIDOBJ,R-O
     BJ,LOW-OBJ,MID-OBJ,UP-OBJ,UNK,UNK,
     H-FENCE
1020 DATA V-FENCE,UP-WALL,LOW-WALL,R-WALL,
     L-WALL,UNK,UNK,UNK,UNK,UNK,UNK,UNK
1025 DATA UNK,UNK,UNK,UNK,UNK,UNK,UNK
1030 DATA 32,33,34,35,36,37,38,39,40,41,42,
     43
1035 DATA 44,45,46,47,48,49,50,51,52,53,54,
     55
1040 DATA 56,57,58,59,60,61,62,63,64,65,66,
     67
1045 DATA 68,69,71,73,75,77,79,81,83,85,87,
     89
1050 DATA 91,93,95,97,99,101,103,105,107,
     109,111,113
1055 DATA 115,117,119,121,123,125,126
```

Checksums

0	$AA65	240	$CCC8
10	$3B00	245	$ECA4
20	$3A2C	300	$5482
25	$9B6D	305	$434A
30	$CBC7	310	$1ACA
40	$5E4E	315	$A011
45	$9E62	320	$AB64
49	$6532	325	$1F70
50	$A831	330	$194D
55	$590B	335	$5E20
60	$3729	340	$109D
65	$5F20	345	$4370
70	$7761	350	$847C
75	$9B2E	355	$5BD1
80	$8E63	360	$AFF0
100	$BD53	365	$26B4
105	$8296	370	$65D3
110	$D7EA	375	$06C3
115	$AD29	380	$2240
120	$270A	385	$3446
125	$CF77	390	$FC79
130	$9E6A	395	$4DF1
135	$F214	399	$E283
140	$2D20	1000	$F930
145	$A2F7	1005	$7117
150	$08B2	1010	$69EF
195	$86F3	1015	$644C
200	$9D55	1020	$BB97
205	$582C	1025	$EFC0
210	$D2C6	1030	$9870
215	$7BEC	1035	$9D8D
220	$0F2F	1040	$1925
225	$0D20	1045	$1AB4
228	$4504	1050	$9C52
230	$710E	1055	$0160
235	$ED28		

Jerry P. Mulder

Softkey for...

Millionaire v2.1

Blue Chip Software

■ Requirements

☐ Millionaire Version 2.1 Program Disk
☐ One blank or expendable disk
☐ COPYA

Millionaire Version 2.1 is a slightly older game, but many readers out there probably have it. Central Point's COPY II+ Bit Copy Program will admirably (and easily) make an archive copy of this program for you, but why not go one better and deprotect it altogether? At any rate, the program can be copied by any whole-disk copier that ignores errors, but the resultant copy will not boot, and just sits there with the illuminated IN USE indicator on your disk drive staring at you till the cows come home.

In the first line of the Hello program, the BLOADing of a small garbage Binary file named CON (perhaps as in "Con" game?) darkens the screen, and the program proceeds no further. The second villain in the following line is a CALL 16384, which is designed to fix the first three bytes of the flawed garbage file. In the protected environment, the CALL 16384 is executed correctly due to disk formatting which is part of the copy protection, consequently, both lines need to be removed in order for the copy to work.

[1] Boot your DOS 3.3 master disk and use COPYA to copy the disk.

POKE 47426, 24 *ignore chksum & epilog errors*
RUN COPYA

[2] Place Millionaire version 2.1 (write-protected) in drive 1, and the blank disk in drive 2, copy from drive 1 to drive 2.

[3] When COPYA is done, remove the original disk, reboot your DOS 3.3 Master, then place the copy you just made into drive 1.

[4] Fix the Hello program by deleting lines 10 through 30.

UNLOCK ENTRA
LOAD ENTRA
DEL 10,30
SAVE ENTRA
LOCK ENTRA

That's all — your COPYA version of Millionaire is done! Installing a fast-loading DOS like Diversi-DOS will speed things up a bit, since the program *really does* take about six (6) minutes to put together a game for you, and during this time there is frequent disk access.

Final Notes: Since the protected DOS is "somewhat normal", this is one of the few copy-protected programs which allows installation of Diversi-DOS or other fast-loading DOS enhancements on a copy of the original program (as usual, try it on a COPY only). When you wish to explore further, also notice that the CDIINC file on the CATALOG is really the file name with identical control characters after each letter (C—ctrl-C—D—ctrl-D, etc.), and the CHR$ (4) command in the ENTRA Hello program has those control characters embedded in it!

Thomas V. Rapheld

M. M. McFadden wrote an excellent article in COMPUTIST #52 concerning Strategic Simulation Inc. (SSI). Although I am not very familiar with ProDOS, I was able to follow his softkey fairly well. It did take me awhile to figure out that I had to use the Apple Utilities Program to switch my Checksoft and Checkbin to a ProDOS format before these typing error checkers would work with Mr. McFadden's softkey.

All his programs and my typing checked out well until I investigated TRANSFER. For a weak programer, like myself, TRANSFER turned out to be a nightmare. Throughout the program all 'commas' (,) were printed as 'periods' (.). In addition, the checksums were based on the symbol 'ON$' instead of the symbol 'OL$' which was printed in the article. The 'ON$' does not work in the program because 'ON' is part of the Applesoft Command 'ON...GOSUB' and 'ON...GOTO', however the checksums were calculated using 'ON$' instead of 'OL$'.

The following lines need correcting for missing commas:

```
127 IF V=3.2 THEN POKE 6774,212: POKE 6795,183:
130 PRINT " INSERT RDOS DISK AND HIT RETURN";:
    CALL-151: PRINT
140 POKE TR,1: FOR A=0 TO 10: POKE SC,A: POKE
    BF,14+A: CALL RW: NEXT:
170 PRINT CHR$(34) NAME$ CHR$(34);: HTAB 41:
    PRINT "TYPE " T$ ", " BL " BLOCKS, START "
    = " SB
200 IF T$="A" THEN CALL 768,P$ + NAME$,A,LD:
    TY$="BAS"
210 IF T$="B" THEN CALL 768,P$ + NAME$,B,LD:
    TY$="BIN"
220 IF T$="T" THEN CALL 768,P$ + NAME$,T,LD:
    TY$="TXT"
230 PRINT D$ "BSAVE" P$ NAME$ ",A" BS*256 ",L"
    LN ",T" TY$
1020 A=24: N$=LEFT$(N$,15): FOR A=15 TO 1 STEP
    -1: IF MID$(N$,A,1)=" " THEN
    N$=LEFT$(N$,A-1): NEXT
1030 NAME$="": FOR A=1 TO LEN(N$):
    A$=MID$(N$,A,1): IF (ASC(A$) < ASC("A")
    OR ASC(A$) > ASC("Z")) AND (ASC(A$) <
    ASC("0") OR ASC(A$) > ASC("9")) THEN
    A$="."
```

After the program is checked with Checksoft and found correct, all the 'ON$' symbols must be changed to 'OL$'.

Although this allows the checksums to be matched, there still is a problem with the program accessing the Catalog of the SSI program which you are attempting to copy. Here I need a lot of help from Mr. McFadden. I believe that hang up is the defining of 'RW'. The program is asked to 'Call RW' which is set at 771. This does not provide access to the SSI disk, but instead the program goes through its operations without accessing a 'NAME$' in the catalog and finishes with 'DONE'. Mr. McFadden states in his article that this Call accesses a short machine language routine (in TRANSUBS) which calls the RWTS routine. Since TRANSUBS is loaded at $0300, I believe 'RW' should be defined to be equal to a number from $0300 to $039C.

I highly appreciate Mr. McFadden's energy in producing and sharing this article with the reader's of COMPUTIST. If he has a little more energy I would appreciate his help in correcting his program.

Part of the problems that you are having are because of the DOS/ProDOS confusion. The rest are mostly our fault. The ON$ in Transfer was noticed by one of our volunteers and he changed the ON$ to OL$. Unfortunately, he didn't recalculate the checksums.

The font that we used for listings in COMPUTIST #52 has a comma with a very narrow downward line. The chemicals used to process the typeset film were cold that morning and the typeset copy came out light. When the printer shot the negatives for the 8 page plate, he had to balance the exposure for the light and dark sheets. No one noticed that some of the commas had become periods. We didn't know anything was wrong until we received the finished magazines. We now insure that the chemicals are at the proper temperature before any film is developed.

As to the variable RW, the TRANSUBS program resides on page 3 ($300) and CALLs from BASIC are in decimal. So, a call to $300 would be 768 in decimal. The call 771 is to $303.

Does anyone have any idea why the Transfer program isn't working? . . . . . RDEXed

Ronald Mundell

A.P.T. for...

Tower of Myraglen

PBI

Hit points can be increased. Before you edit, take note of how much gold, and hit points you have when you save the game. They are located with a block editor at block $05DD. I changed them only after having saved my place in the game, so the posession data would begin to be recorded also. When you locate your hit points (mine were located at bytes $62-66; you must take note of all of the following text, you have to enter all of the data spaced as it was before you enter a new value: Everthing must shift to the right to allow for hit points up to about 2500. Use the text mode to alter the bytes. After the hit points are the damage points, then defense points. Gold points are about the last entry, you should be able to recognize them. The posession bytes preceed the hit points, and are marked by 1, meaning posession of the item. I didn't map them out, as one should be able to find the items when you have enough hit points.

Lewis D. Kaufman

Without so much as a campaign speech, I have been elected the Apple Guru of our school. To some this might seem an honor. My problem is that I really don't know that much about the whole thing! Oh, I've been reading COMPUTIST for several years and know a bit from a byte, but when it comes to moving RWTS to a safe memory location or following a jump command, I'm afraid I'm lost. So, you say, what am I doing writing to COMPUTIST? Well I'm proud of myself, for one thing!

Anyway, recently a teacher presented me with two Appleworks Data Disks that gave the dreaded message "Getting errors trying to read directory". I cannot repeat her comments when I asked her "Where are your backup disks?". With tears streaming down her face and pleading for help, she finally convinced me to give it a try.

After write protecting her disks, I tried cataloging them with COPY II+ 8.3. The disk head had to recalibrate to track $00 several times but eventually the catalog appeared. Aha! piece of cake! Copy files to RAM then back to a newly formatted Appleworks Data Disk and done, right? That was two days ago.

When I tried to COPY files, I kept getting an error in Block $0002? Not knowing for sure what, or where exactly, this was, I tried loading files from a known good disk. While they loaded, I watched the readout on my Trackstar indicator. It seemed that Appleworks Data Disks have catalog information on track $00 because as each file was loaded, from the good disk, the head returned to track $00 before going to other tracks for information. To confirm this, I copied a good track $00 onto a formatted disk and then cataloged the new disk. Sure enough, there was a complete list of files. In desperation, I even tried to sector copy the bad data disk only to get a read error on track $00. This only confirmed what I suspected- a problem on track $00.

As luck would have it, my renewal of COMPUTIST arrived yesterday and along with it the COMPUTIST Starter Disk. After reading the instructions for each section, it seemed like a good idea to look at the sectors on track $00 using the DiskEdit program. Hey, even I get lucky sometimes! When I got to Sector $06, I got a disk error and the head tried to recalibrate to the track $00 position. I couldn't actually read sector $06, however. This made me "curiouser" and "curiouser".

Hauling out a good disk, I read the same track sectors. Especially sector $Ø6. Sector $Ø6 contained all $ØØ's. Maybe a little knowledge is a dangerous thing, but I reasoned that if the good disk contained all $ØØ's in Track $ØØ, Sector $Ø6, maybe all Appleworks Data Disks do.

Using Appleworks, I formatted a data disk. Then, using the Diskedit program, I read track $ØØ, sector $ØØ from the damaged disk and wrote it back to the new disk at track $ØØ, sector $ØØ. I did this for all sectors on track $ØØ, **except** sector $Ø6. I now had a disk with track $ØØ having the same information in each sector as the damaged disk, **except** sector $Ø6, which contained the data placed there when it was formatted. Next I booted COPY II+ and sector copied tracks $Ø1 through $22 from the damaged disk onto my new disk.

OK, cross you fingers! Booting Appleworks and selecting #1 from the main menu, it worked! I actually did it. The new disk had all but 4 files present.

Someone out there probably already knew this or knew a better and more successful method and this might not be any great accomplishment to them. I know I didn't crack Garfield or Bard's Tale and I wasn't 1ØØ% successful in getting all the files back but it made the teacher very happy and, hey, isn't that what being a Guru is all about anyway?

This would be a good time for someone to write an article showing how the ProDOS directory is formatted. . . . . RDEXed

Tim Furry

Notes on copying TOMAHAWK

This is NOT a proper softkey, but merely a way to back it up. I started by using Copy II+ 8.3 Bit Copy parm "TRY.STANDARD". It seemed like this would work, but half way throught the boot, it died. So I again tried "TRY.STANDARD". This time it worked and it seems I have a deprotected copy, since I tried making a copy of a copy.

? I am having a problem with backing-up Zany Golf by Electronic Arts, however. I have found what appears to be the protection code, but I can't find it on the disk and I don't know what I should change it to. The code runs as follows:

```
ØØ/5E02:ØØ 65 BRK 65
A=302D X=ØØ5A Y=ØØ2A S=Ø1EF D=ØØØØ P=3Ø
B=ØØ K=ØØ M=ØC Q=9F L=1 m=1 x=1 e=1
```

If anyone can help, please let me know!

? Also I desperately need a softkey for Skate or Die IIgs, Electronic Arts, California Games IIgs, Epyx, Mini-Putt IIgs, Accolade, and of course Alien Mind. I can not express in words my desire for an Alien Mind softkey. Just suffice it to say that the person who cracks it will, in my eyes, be a godsend to the users of America!

John Windle

I'd like to thank all the people that gave explanations in their softkeys, it helps a lot.

IIgs Softkey for...

Strip Poker GS

Artworks

This is a BASIC game, with a lot of BIN. files, so by running everything from immediate mode, I found the protection in the files called PLOADAN and PLOADSH. Both look like this.

```
AC6  LDA #9FF
AC9  TCS
ACA  PEA ØØØØ
ACD  PLD
ACE  LDX B1Ø
AD1  LDY ØØØØ
AD4  JSL ØØ6ØØØ          this is the check routine
AD8  CMP #ØØ11
ADB  BEQ AE2
ADD  SEC
ADE  XCE
ADF  JMP C5ØØ             reboot slot 5
AE2  SEC
AE3  XCE
etc
```

To fix this I just NOPed everything from ADB through AE1, and it worked.

There was another problem with this program, every other time it drew a picture, it would be junk. The call to draw the screen was in a file called DW15. The routine started at $7DØC.

```
7DØC LDA ØØ               picture #
7DØE ASL                  double it
7DØF TAX                  make it an offset
7D1Ø LDA 7D6C,X           get address LO
7D13 STA 7D57             store pic address in prog
7D16 STA 7D5E
7D19 STA 7D36
7D1C INX
7D1D LDA 7D6C,X           do the HOB
7D2Ø STA 7D56
7D23 STA 7D5D
7D26 STA 7D35
7D29 JSR 7D47             unscramble pic
```

After the RTS, they displayed the picture then jumped to $7C4Ø.

```
7D47 CLC
7D48 XCE
7D49 REP #3Ø
7D4B LDA #1F2B
7D4E STA 7D78
7D51 LDX #ØØØØ
7D54 LDA Ø4ØØØØ,X   this is one of the addresses put in by the prog
7D58 EOR 7D78              unscramble one word
7D5B STA Ø4ØØØØ,X          another address put in
7D5F INC 7D78              increment EOR value
7D62 INX
7D63 INX
7D64 CPX #5BDF             pic = 5BE1 bytes
7D67 BCC 7D57
7D69 SEC
7D6A XCE
7D6B RTS
```

The picture address data follows from $7D6C to $7D78.

The problem was that it would load the picture one word at a time, unscramble it, then put it back. But the next time it went through this subroutine, it would load, scramble it, and put it back.

I rewrote part of this code so it would load the word, unscramble and put on the super hires screen, never altering the original picture. Here goes.

```
7DØC LDA ØØ
     ASL
     TAX
     LDA 7D6C,X
     STA PICIo
     INX
     LDA 7D6C,X
     STA PIChi
     JSR 7D47
     JMP 7C4Ø              the old one jumped here
```

And at 7D47:

```
7D47 CLC
     XCE
     REP #3Ø
     LDA #1F2B
     STA 7D78
     LDX #ØØØØ
MORE LDA Ø4ØØØØ,X          pic HI LO
     EOR 7D78
     STA SUPHIREZ,X        =E1/2000
     INX
     INX
     CPX #5BDF
     BCC MORE
     SEC
     XCE
     RTS
```

The hex code is:

```
7DØC:A5 ØØ ØA AA BD 6C 7D 8D 57 7D E8 BD 6C 7D 8D
56 7D 2Ø 47 7D 4C 4Ø 7C
```

And

```
7D47:18 FB C2 3Ø A9 2B 1F 8D 78 7D A2 ØØ ØØ BF ØØ
ØØ Ø4 4D 78 7D 9F ØØ 2Ø E1 EE 78 7D E8 E8 EØ DF 5B
9Ø EB 38 FB 6Ø
```

When you go to save the program, its "BSAVE DW15,A$7000,L$D7D".

I know this is a lot of typing, but it works.

? I have a question. Would somone write a program or, better yet, tell me how to put the output from INSTDSP (monitor ROM display dissembled instruction $F8D0) into a buffer so I can disassemble to a text file, instead of using reams and reams of paper? This will be most useful to me, as I'm just learning this computer stuff (I got my IIgs one year ago), and I try to disassemble everything I can find to see how it works. Thank you.

Steve Lawrence

IIgs Softkey for...

Monte Carlo
PBI Software Inc.

This is a great gambling simulation making full use of IIgs capabilities. The mouse control is outstanding. Be sure to set the System Speed to FAST from the control panel otherwise you'll have a very slow roulette wheel, etc. The protection allows you to copy a disk and use it normally but will hang when you attempt to cash out (save your scores). The deprotection technique is identical to that for Tower of Myraglen by Stephen Lau in COMPUTIST #53 except for its location. I searched for the string C9 0B 00 F0 03 and found it in three places. Only the first location was necessary to edit.

[1] Copy the disk ignoring errors.

[2] Using the Copy II+ or ProSEL block editor, make the following changes to the copy:

Block	Byte(s)	From	To
$E4	$5C	C9 0B 00 F0 03	A9 0B 00 80 03

IIgs Softkey for...

Jigsaw!
Britannica Software

If you like Shanghai, this one is another *must* in your library of addictive games. It also uses GS/OS in place of the old ProDOS 16 "shell". A copy will work. However, if you attempt to SAVE a game in progress or your scores, the program will check for an original disk and if not found will ask you to insert it. Having studied Brian Troha's work on Unicorn products in COMPUTIST #61, I searched for the nibble count strings for tracks $20 and $21, A2 20 A0 01 and A2 21 A0 01. The disassembly of the code was almost identical to Magical Myths (COMPUTIST #61, pg 10). I found it early on block $26.

[1] Copy the disk ignoring errors.

[2] Using the Copy II+ or ProSEL block editor, make the following changes to the copy:

Block	Byte(s)	From	To
$26	$130	A2 21	80 2C

IIgs Softkey for...

Shanghai
Activision

To determine which version of this program you have, CATALOG the disk and check the date of the START file within the System Directory. Version 2 is dated 20 Jan 87 and has a bug in it that causes an error when displaying the Dragon if you have the current ROM 01 (Why have you waited to upgrade? It is free from any dealer.). Version 3 fixes this problem and has a date of 15 Sept 87 for the START file. The location has shifted a few bytes. So to repeat Alexis Gehrt's technique in COMPUTIST #48, pg 20:

[1] Copy the disk ignoring errors.

[2] Edit the copy:

For Version 2:

Block	Byte(s)	From	To
$27D	$162	18 FB C2 30	A9 01 00 6B

For Version 3:

Block	Byte(s)	From	To
$27D	$168	18 FB C2 30	A9 01 00 6B

? Help! Has anyone updated the technique in COMPUTIST #25 for "Where In The World Is Carmen San Diego?" to utilize the VISIT MONITOR feature on the IIgs? I've entered the IIgs monitor and tried 2100<0000.07FFM after the boot side stops loading, and then followed the rest of the softkey but without success. Also, the "Where in USA" scheme in COMPUTIST #52 doesn't work for me. Jim Hart's 3½" technique for Carmen Europe in COMPUTIST #61 works like a charm. It would be nice to do that for all the Carmen San Diego titles. TETRIS uses a "soft" form of copy protection which requires you to look up randomly located words in the manual before you play. These words are upper/lower case sensitive. Bypasses for the IIgs version? Spectrum HoloByte deserves credit for including multiple versions in a single package.

Dave Morgan

Some GS notes

Turning the Control Panel on and off

Have you ever had any of your GS programs "Turn off" the Control Panel before? Well FEAR NOT! For this is usually easy to overcome. A vector, stored as a long JMP (opcode $5C) to the Desk Manager interrupt handler, which actually calls the CDA menu, is located at $E1/0048. What this means is, every time you press Open Apple-Ctrl-Esc, program execution halts and a jump is made to that vector. One way to disable the Control Panel is to store a CLC and RTL (Return from Subroutine Long) at the beginning of the vector, or have the vector point to an RTL, thereby causing absolutely nothing to happen when you try to enter the CDA menu. The vector can be changed by storing a new address at the vector (which Apple strongly advises against) or, by making Miscellaneous tool set call $1003 (_SetVector) which will install the vector for you properly. The code to change the address of the vector to, say $03/2000 would look like this...

```
CLC
XCE
REP #$30        Set full native mode, long registers.
PEA $0012       Push the reference number for proper vector.
PEA $0003       push the bank number first. (12=$E1/0048)
PEA $2000       Than the offset.
LDX #$1003      Finally, call the Tool
JSL $E10000     Dispatcher.
```

The result is, the vector now points at $03/2000. Now how do we get around this? Well one of the ways is to search the disk for 49 00 E1 and disable anything that is stored there, or you could search for the _SetVector call by searching for A2 03 10 22 00 00 E1, and NOP out the whole routine. But if you want to have access to the visit monitor function and don't have a desire to return to the program once you are there, then why not use one of the other vectors to your advantage. By using the flush-key vector, which is at $E1/004C, right after the Desk Manager vector, we can gain access to the Control Panel, regardless of what they have done to the other vector. To do this, start up your computer and enter the monitor:

CALL -151

Now copy the CDA vector over the Flush-key vector like so.

E1/4C<E1/48.4BM

Now boot the protected disk.

5[Ctrl]P

Now, when you want to enter the monitor, or whatever, just press [Ctrl][Open Apple]DEL and bingo! You should be at the CDA menu! Note: You will NOT be able to return to your program, (If you select quit, the CDA menu comes up again). If anyone knows of a way to enable quit to work, (Mr. Troha?) please send it in! Though I think the problem is in the way the Flush-vector is called.

Some notes on the Apple 3½" drive

For those who have the Apple IIgs Firmware reference, a semi-working knowledge of how the SmartPort is called, and were wondering about the Apple 3½" specific SmartPort calls, this info should shed a little light on the subject. (I hope this will help you see how the device driver can read different format disks, Mr. Jetzer.)

I've been curious for awhile about just how the Apple 3½" drive works. So one rainy day I decided to snoop around bank E1 memory and see what goodies I could find. When I got to page $ØF, I ran into a set of somewhat familiar bytes. Looking on, I saw what appeared to be disk prologue and epilogue bytes, and that's just what they were! When you make a call to the SmartPort to change the disk marks, the table of bytes that are changed is stored at E1/F57 to E1/F61.

As for the SetHook routine, the addresses of the routines are stored starting at E1/F6F. They are repeated because the first one in each set is changed using the SetHook call and the second one is placed back over the first when a ResetHook call is issued. I still don't know exactly how the routines work, but maybe this information will give someone who has the time, the incentive, and the insanity to tear apart the code and figure out exactly how a disk is read from, turned on, etc.

Catalyst probably makes a direct call to the SmartPort to change the format so the device driver can read those blocks, then it would change it back to normal. If you want to look at their read routines, try to enter the monitor while those blocks are being read, then list the hook table that starts at E1/F6F. If there are no changes to this table, look at the disk mark table. I hope this helps. Try the Apple IIgs Firmware reference. It doesn't get too involved in the sethook routines or their functions, but it does provide a good start. Incidentally, by setting bit 6 of $CØ31 and accessing $CØE9, you can turn on the light on the Apple 3½", but the motor doesn't start up! Does anyone know why? What must be done to turn the drive on? I am clueless, except that maybe a few more softswitches might have to be switched.

A.P.T. for...

Wings of Fury
Broderbund

In answer to Mr. Jones letter, to get endless lives and bombs/rockets/torpedoes in WOF just make the following edits to side A:

Trk	Sct	Byte(s)	From	To
$15	$C	$AC	CE 86 Ø9	EA EA EA
$18	$D	$FØ	CE 86 Ø9	EA EA EA
		$88	Ø1	ØØ

The first two edits disable the decrementing of $986 (In the alternate bank of memory) where the number of bombs are stored, and the last edit prevents the number of planes from being reduced.

Appleworks to DOS Text

As for your other question, to make an Appleworks file into a DOS 3.3 Text file is not that difficult, providing you have the right tools. First, load in the file you want to change, then, select <open-apple>-P to print it, hit <Return>, and, when it asks for your printer, choose the last option, Print to text (ASCII) file on disk. It will then ask for a pathname, enter it and press <Return>. When it is done saving your file, use a utility like the ProDOS Convert disk, or better yet, Copy II Plus utilities to convert/copy it to a DOS 3.3 disk, and you are done!

Softkey for...

Shadowgate GS
Mindscape

■ Requirements

☐ Apple IIgs
☐ 3½" Disk copier that will ignore errors
☐ 3½" Disk editor

This program sounds like it is using sync-tracks. When I went to make a backup, I got an error on block $ØØ7 of the Program disk, and when I booted the copy, I heard the distinctive sound of the drive arm moving rapidly.

How I found the protection

When I set out to deprotect a disk, I usually start at the end and work my way back. First, I boot the disk and see just how it crashes (Reboot? Hang? Message?, etc.). If the disk reboots, (though I have yet to find a GS protection routine that does) then I look for the standard ways to reboot (JMP $CxØØ, X=slot). If it hangs, I look for a branch offset of $FE (any branch with this offset is an infinite loop) or I look for a JMP to itself, though these are usually tricky to find (read "luck"). If the program gives you a message, you can look for the code that prints it!

With Shadow Gate, when you boot from a copy, you get a message "Please insert the original program disk", where it then looks for the original disk, and continues booting on the copy. This is known as a key-disk system, because, to "Unlock" and use the program, you have to insert the "Key". After a little searching around, for the text, I found a little routine at $Ø3/3AFB, where a few comparisons are made and, depending on certain values, different messages are printed. (Like I/O error and the "Please insert..." message.) The text is printed out, using a toolbox routine ($11Ø1). Now all I had to do was find out where that was called from by searching for 2Ø FB 3A. I found it in several different locations, but the code is pretty much the same in all of them, as the one listed below.

```
Ø1 PEA #ØØØ3
Ø4 PEA #C9DA
Ø7 JSR 35A7
ØA LDX #BFE2
ØD LDY #ØØØ3      Set up parms for the check routine
1Ø JSL Ø3E755     Call the disk check
14 CMP BEBB       Is the disk good?
18 BEQ 21         Yes, continue program
19 LDA #ØØ8Ø      Otherwise, set a flag to indicate the disk is
                  a copy
1C JSR 3AFB       Go to the routine to print the error message
                  'Please insert...'
1F BRA Ø1         Go see if the original disk is now in a
                  drive.
21 ...            Continue loading.
```

This routine is easy to defeat. All we have to do is change the BEQ in line 18 to a BRA (Branch Always) and the program will continue on it's merry way.

In cookbook fashion, here are all the edits necessary to deprotect your copy of Shadowgate.

Block	Byte(s)	From	To
$ØØD	$Ø5C	FØ	8Ø
$ØØE	$15A	FØ	8Ø
$Ø23	$149	FØ	8Ø
$Ø24	$Ø39	FØ	8Ø
	$ØB4	FØ	8Ø
	$19Ø	FØ	8Ø
$Ø27	$1EE	BØ 7Ø	EA EA
	$1F3	DØ 6B	EA EA

And that's it!

(?) By the way, I need some help with this game. I have yet to figure out how to get past the second screen. The one where you first enter the dungeon, with two locked doors. At first I thought that this might be a bit of protection, but even when I play from the original, I am stuck. HELP!

Softkey for...

Bard's Tale II (GS)
Electronic Arts

■ Requirements

☐ Apple IIgs
☐ 3½" Disk copier that will ignore errors
☐ 3½" Disk editor

This is a great game, in the spirit of Bard's Tale, but 5Ø% percent bigger, and with even

more monsters and spells than the first one! If you liked Bard's Tale, you'll love this one! The only problem is, of course, the copy-protection.

Finding the protection

This game uses the familiar "key-disk" scheme, with what looks like some sort of bit-insertion block check on $63F, and there does not appear to be any other "signature" checking. Well anyway, this disk had the usual "Insert the master disk" or something like that, and would go into an infinite loop till it found the correct disk. Well, this is easy to fix, simply get out your block editor and make the following edits.

Block	Byte(s)	From	To
$42C	$1E8	A9 18 8F 48 00	EA EA EA EA EA
		E1 A9 6B 8F 49	EA EA EA EA EA
		00 E1	EA EA
$42E	$03E	$F0	$80

The first set of edits reenables the control panel, and the second one does the actual deprotection. One word of warning, when there is any kind of music playing, (Bard's song, tavern music, other sound effects) do NOT go to the monitor! For some reason, the music gets messed up, and hitting ctrl-Y only makes the computer crash! Well have fun and, happy hackin!

Maxwell Campbell

Softkey for...

Design Your Own Train
Run Your Own Train

Abracadata

Wait long enough and it will show up in COMPUTIST. While these two programs were not on the most wanted list, they were certainly on mine. I had invested so much time in tracing and trying different approaches, I was anxious to see the final solution. It turns out that the softkey sent in by Michael Paterno for Design Your Own Home and published in COMPUTIST #58, works perfectly on these programs also. I suspect it will work on all of Abracadata's design series.

Just follow the instructions exactly as entered in issue #58 for Design Your Own Home series and you will have a deprotected copy of the railroad programs.

Softkey for...

Starglider

?

While this program isn't protected it does require you to look up a word in the novella that comes with the program to play the game. To get around this you can edit the disk. With a sector editor look for the hex code 20 13 60 and change it to 4C 5A 61. On my copy this code resides on track $10, sector $0F starting at byte $0A.

Trk	Sct	Byte(s)	From	To
$10	$0F	$0A	20 13 60	4C 5A 61

I've made every patch to Silent Service mentioned in COMPUTIST #39, #45, #46 and #50 plus the changes shown by Copy II Plus and I still run into those damnable enemy mines. The code I found to change reads exactly like that published so I believe my version is the same. Is anyone else having this problem? Has anyone solved it?

Leh-Wen Yau

Softkey for...

Tetris

Spectrum Holobyte

Tetris comes with a 3½" disk for IIgs, and a 5¼" disk for IIe, IIc (side 1) and II+ (side 2).

Even though the 3½" disk (IIgs version) is not copy-protected, it asks you to find a specific word from the manual as the password before allowing you to play the game. This pain-in-the-neck imposition on legitimate TETRIS owners imposed by the publisher can be found in the very beginning of the code:

```
20 CE 57      JSR $57CE      Password verification
AD B7 0F      LDA $0FB7      Verification return code
D0 03         BNE :1         Verification failed
20 65 04      JSR $0465      Main routine
20 6E 01   :1 JSR $016E      Closing
              JSL $E100A8    ProDOS 16 Quit call
              $0029
```

To defeat this password verification, just replace the first line with 9C B7 0F (STZ $0FB7). This is located at offset $51 in the first block of the file TETRIS, which is block $2B (43) on my copy of the program.

[1] Make a copy of the 3½" program disk.

[2] Make the following changes on the copy:

Block	Byte(s)	From	To
$2B	$51-53	20 CE 57	9C B7 0F

[3] Write the block back to the copy.

The 5¼" disk is copy-protected. The 128K version of the game, however, is also on the 3½" disk. For IIc or IIe, follow these steps to make a COPYA-able disk of the game:

[1] Initialize a 5¼" disk in ProDOS format.

[2] Copy ProDOS (8 bit version) from your system disk to it.

[3] Copy the following files from the 3½" disk:

TETRISC
IIC.DATA (*subdirectory and all the files in it.*)

[4] Rename TETRISC to TETRISC .SYSTEM on the 5¼" disk.

Craig Meekins

Softkey for...

Paperboy IIe

Mindscape

■ Requirements

- ☐ COPYA
- ☐ Sector Editor
- ☐ 1 blank disk

This Mindscape game differs from previous ones of theirs I have deprotected. Paperboy is ProDOS based, so the old reliable sector edits to track $00 for the older Mindscape releases cannot be used, but, the protection is basically the same as their older releases. The address epilogs have been changed from DE AA to FF FF, and there is a signature check.

If you load PBLOAD.SYSTEM at A$2000, in the monitor, (the address ProDOS would load if you booted the disk, since it is the first SYS file) and follow the JSR's, JMP's, and RTS's, you will come to a JMP $2247. This, strangely enough, occurs after a JSR $225A which makes all kinds of CMP's to disk address marks. I wondered what would happen if this JMP never took place, thus preventing the code from circling back again to do disk CMP's. Eureka!, the program booted up and the disk was deprotected.

[1] Boot your DOS 3.3 system disk.

[2] Tell DOS to ignore checksum and epilog errors and use COPYA to copy the disk.

POKE 47426,24
RUN COPYA

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

Trk	Sct	Byte(s)	From	To
$14	$01	$2F-30	4C 47 22	EA EA EA

By the way, I got these sector edits by following techniques laid down by Jim S. Hart (COMPUTIST #57), Gerald E. Myers

(COMPUTIST #59), and Gary Verbuch (COMPUTIST #61). You can learn a lot by following the leg work others have done for you.

Softkey for...

Dreadnoughts (IIe)

Avalon Hill

■ **Requirements**

☐ Super IOB
☐ blank disk

Here's a quick one for Dreadnoughts. This game is protected/deprotected by the same method that most of the Avalon Hill games are.

[1] Init a blank disk and delete the hello program.

INIT HELLO
DELETE HELLO

[2] Boot the Dreadnoughts disk and press [RESET] after the first 3 tracks are read.

[3] Enter the monitor and move the protected RWTS to a safe location.

CALL-151
1900<B800.BFFFM

[4] Place your slave disk from step 1 in the drive and boot it.

C600G

[5] Save the protected RWTS to a disk containing Super IOB.

BSAVE RWTS.DREAD,A$1900,L$800

[6] Install the controller below into Super IOB and run it answering "NO" when asked to format.

Controller

```
1000 REM DREADNOUGHTS CONTROLLER
1010 TK = 3:ST = 0:LT = 35:CD = WR
1020 T1 = TK: GOSUB 490: GOSUB 360: ONERR GOTO
     550
1030 GOSUB 430: GOSUB 100:ST = ST + 1: IF ST < DOS
     THEN 1030
1040 IF BF THEN 1060
1050 ST = 0:TK = TK + 1: IF TK < LT THEN 1030
1060 GOSUB 490:TK = T1:ST = 0: GOSUB 360
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 : PRINT "COPY^DONE" : END
10010 IF PEEK (6400) <> 162 THEN PRINT CHR$ (4)
     "BLOAD^RWTS.DREAD,A$1900"
```

Checksums

```
1000  - $356B      1060  - $20C0
1010  - $3565      1070  - $28C5
1020  - $6170      1080  - $6CA2
1030  - $7771      1090  - $9DCA
1040  - $6342      1100  - $9A4D
1050  - $ABA3      10010 - $F2CE
```

That should do it, go out and make a fleet to conquer the oceans.

Bug in the Softkey for...

Mindshadow

Activision

I have discovered a bug in the Mindshadow softkey by Wayne Williams (COMPUTIST #47). One sector edit was left out that will allow Mindshadow's deprotected DOS to read the back side of the normalized disk. Add the following sector edit to the table compiled by Mr. Williams to complete the softkey.

Trk	Sct	Byte(s)	From	To
$00	$0C	$67	??	AA

? I would like to know if anyone has been able to successfully follow Christopher Dean's softkey of Jet in COMPUTIST #51? I have tried several times and the disk crashes into the monitor after the first track. If anyone can help, please write in and give the complete procedure.

Doyle H. Brown

Some notes on Tetris

Tetris is a nice game, whose IIgs version comes on a non-copy-protected disk. So far, so good. It does have two annoyances, however. One is a log-on procedure, requiring the player to enter a word from the manual by page and line number in response to the program's prompt. Only then will it load and run. The second, is a musical title screen with the program's history explained and all publishing credits slowly scrolling by. It takes almost two minutes.

The first problem I was able to ease by searching the disk for the table of code words. I found it in blocks $1000 and $1001, as ASCII. I changed all the words in the table to spaces (I used Copy II+). Now I type spaces (or just carriage returns) at the log on prompt and the program accepts them and proceeds to run fine. I would rather bypass this screen altogether, but that will have to be left to someone else.

For the second problem, wait until the program has loaded and the words begin scrolling on the screen. A click on the mouse button will then begin the game.

Dan Halfwit asks how to copy Tomahawk. I'm not a code cracker, but I can give him a hint on how to deprotect it. I make a copy by bit copying track $22.

Bill Jetzer

Fixing the Core Disk Searcher

■ **Requirements**

☐ Core Disk Searcher (from starter kit)

I recently discovered a small bug in the CORE DISK SEARCHER (CDS). It usually will not cause any problems, but may in some cases. To demonstrate an example of the bug, take a look at the following partial disassembly of track $00, sector $00 of a DOS disk:

```
0801- A5 27  LDA $27
0803- C9 09  CMP #$09
0805- D0 18  BNE $081F
0807- A5 2B  LDA $2B
0809- 4A     LSR
080A- 4A     LSR
080B- 4A     LSR
080C- 4A     LSR
080D- 09 C0  ORA #$C0
```

Run CDS, set the high track and sector to $00, and search a DOS disk for the last three bytes from the above disassembly (4A 09 C0). Were you surprised that CDS didn't find them?

The reason CDS didn't find them is that if the right byte isn't found, it will always start over looking for the string at the next position. It should only start over at the next position if it is still searching for the first byte of the string. Here is what happened, starting with the byte at $8008:

1. 2B - no match, start looking at next position
2. 4A - found a match
3. 4A - no match, start looking at next position (should have started here)
4. 4A - found a match
5. 4A - no match, start looking at next position (should have started here)
6. 09 - no match, start looking at next position

At step 1, the byte wasn't a match, so it started looking at the next position. At step 2, it found a match. At step 3, the byte wasn't a match, so it started looking at the next position. It should have started looking at the same position. Steps 4 and 5 are re-runs of 2 and 3 and as you can see, cause CDS to miss the string.

To correct the bug, all that must be done is to rewrite a portion of the code so that it checks if the first byte is being searched for or if it has found some of the string already. Here is the procedure:

[1] Load the machine language routine.

BLOAD SEARCH.OBJ

[2] Get into the monitor.

CALL-151

[3] Move the code to a different location to avoid retyping the whole thing.

2FF0<2F0.3A8M

[4] Insert the new code.

36C:09 C0 00 D0
370:EB E8 D0 EA F0 07 C8 C4
378:FD D0 F6 F0 05

[5] Move the last part of the code back.

37D<307A.30A8M

[6] Correct a couple branch statements.

367:0E
380:C6
390:CB

[7] Save the code back to disk.

BSAVE SEARCH.OBJ,A$2F0,L$BC

[8] Load the Applesoft program.

LOAD CORE DISK SEARCHER

[9] Update some lines to work with the new machine language routine.

```
370 TEXT: CALL 925: END
430 01 = 1: Z = 0: TW = 2: C1 = 915: C2 = 921: C3 =
    908: PR# Z: IN# Z: CALL 1002
```

[10] Save the file to disk.

SAVE CORE DISK SEARCHER

Brian A. Troha

It seems I have gotten a little slow about writing my articles. After checking the Most Wanted List in COMPUTIST #62, I found five programs that I had articles/kracks for. So I sent them in, sorry for the delay.

I'll work on dissassembling the code for Alien Mind, but it may take a long time.

The "King of Chicago" uses the 3½" nibble counting routine, search for A9 20 00 and A9 21 00 to find part of the protection. Anyone have any luck with this one? Beware: It may bomb after several minutes of play, I'm still trying to get a copy to look at. Could you help us out here, Mr. Stephen Lau?

I would like to request a few articles: Manhunter (Sierra), SuperStar Ice Hockey, Deja Vu, Shadowgate, Uninvited (all from Mindscape), Bubble Ghost (Accolade), Mancala and TrianGO (California Dreams/Logical Design Works). Nice little list, right? It's not that I cannot do these programs, I just don't have copies of them to work with.

Help with 3½" copy protection

listed by company

The only reason I'm writing this generalization of copy protection routines by companies, is, so someone will read it and make some exceptions to it:

Key	explanation
CODE:	You must enter a specific letter from a code wheel or manual
BB $x:	Bad Block check, where x is the block number
20/21:	A commercial nibble counting routine

Accolade

Use 20/21 & BB $7

Scan for: A2 20 A0 01 & A2 21 A0 01

To bypass, you must check each routine and decide how to skip the check. Examples (20/21): Mini Putt, Graphic Studio, 4th & Inches, Serve & Volley. Examples (BB $7): Mean 18, HardBall.

Activision

Old releases use BB $7

New releases use BB $63F

Scan for: 22 A8 00 E1 08 (old 1) or C9 01 00 D0 (old other) or 22 A8 00 E1 22 & C9 27 (new releases)

To bypass, you must check each routine and decide how to skip the check. Examples (old 1): Paintworks Plus, Draw Plus, Writer's Choice. Examples (old others): Hacker 2, Shanghi. Examples (new): The Last Ninja.

Cinemaware

Use 20/21

Scan for: A2 20 A0 01 & A2 21 A0 01 & A9 20 00 & A9 21 00

To bypass, you must check each routine and decide how to skip the check. Examples: Defender of the Crown, King of Chicago.

Electronic Arts

Early programs used BB $63F (on two ProDOS 16 releases)

Newer programs use 20/21 (popular on the ProDOS 8 releases)

Scan for (new releases): 21 01 B0 31 86 00 84 01 & 20 01 B0 14 86 02 84 03

To bypass, you must check each routine and decide how to skip the routine. Examples: Deluxe Paint 2.0, Instant Music. Newer releases: Music Construction Set, Marble Madness, Zany Golf. Examples other: Bard's Tale GS, Bard's Tale 2 GS.

Epyx

Use 20/21

Scan for: A2 20 A0 01 & A2 21 A0 01

To bypass, you must check each routine and decide how to skip the routine. Examples: World Games, Winter Games, Destroyer, Street Sports Soccer, California Games.

Logical Designs/California Dreams

Use CODE

To bypass, you must step/trace the program through to the letter check. When you find the routine you must decide how to skip/bypass it. Examples: Club Backgammon, Vegas Craps, Vegas Gambler, Mancala, TrianGO

Mindscape

Use CODE, BB $7

Scan for (ProDOS 8 release with BB $7): 22 00 90 00

To bypass, you must check each routine and decide how to skip the routine. Examples (BB $7): Gauntlet, Paperboy. Examples (CODE): Superstar Ice Hockey.

PBI

Use BB $7

Scan for: C9 0B 00 F0 03 A9 00

To bypass, change the sequence to EA EA EA EA EA A9 0B. Then back up four bytes from edit and change the 22 to AF. If the 22 is NOT present then make no further changes. Examples: Tower of Myraglen, Sea Strike, Cobra Cavern.

Sierra On-line

Use BB $634

Newest use CODE

Scan for: 01 00 F0 04 22 00 00 00 22 & for newer releases add C9 27 02 F0 04 22

To bypass, change the last 22 in each sequence to AF (only on the boot disk if the program come on two disks). For single disk releases, each protection scheme will be different. To find these scan for A9 34 06 (LDA #634) or F4 34 06 (PEA 0634), then examine the routine and decide how to skip/bypass it. Examples: King's Quest 1, Space Quest 1, Leisure Suit Larry. Newer releases: King's Quest 2 & 3, Space Quest 2. Single disk releases: Thexder (old version and new joystick version) Newest: Manhunter

Styleware

Use 20/21

Scan for: A2 20 A0 01 & A2 21 A0 01

To bypass, you must check each routine and decide how to skip the routine. Examples: Multiscribe 3.0, TopDraw.

Unicorn

Use 20/21

Scan for: A2 21 A0 01 20

To bypass, change the A2 21 to 80 2C. Examples: Aesop's Fables, Magical Myths, Read and Ryhme, Math Wizard, All About America, The Adventures of Sinbad, Tales from the Arabian Nights.

Steps to bypassing such protection schemes

1. Determine the protection scheme used.
   A. Copy the disk.

a. If read block error, then BB type protection.

B. Boot the disk (helpful in determining the operating system).

a. If it asks for an master/key disk, then 20/21 protection.

b. If it runs fine, buts ask you type a certian letter, then they're using a CODE protection.

c. If it runs fine until you quit, then no protection is used.

2. Determine the company that made the program.

A. Read the box it came in and find out.

3. Determine the operating system, ProDOS 8, ProDOS 16/GS OS or a special modified loader (remember from booting the disk).

4. Most important: Refer to COMPUTIST for softkeys on programs that are by the same company and try to adapt the procedure.

A. Also refer to the above generalization by companies.

5. Find the protection routine on the disk.

A. BB $x (ProDOS 16/GS OS), scan for 22 A8 00 E1 22 00.

B. BB $x (ProDOS 8), scan for 20 00 BF 80.

C. Also scanning for C9 27 will sometimes reveal BB $x checks.

D. 20/21, scan for A2 20 A0 01 & A2 21 A0 01.

E. CODE: You'll have to wait for an upcoming article (I'm writing).

F. Use any alternate scan sequeance listed above.

6. Study the protection routine.

A. IMPORTANT: Take as many notes as possible. I often use 3 or 4 pages per program in my "protection notebook".

B. Make an edit; write down: Block $, Byte $, From, and To. Always do this, incase you have to change it back!

a. Change conditional branches to BRA (80 - BRanch Always), or to 2 NOP's so the code will "fall" through to the next instruction.

b. First try changing BNE XX (D0 XX - Branch Not Equal) to NOP NOP (EA EA), if it's not equal, then it's probably not correct. IE: It failed.

c. Likewise, BEQ XX (F0 XX - Branch Equal) to BRA XX (80 XX).

C. Boot the disk to see the affects of your edit.

a. If the program boots, then use the program for awhile to see if everything works right.

D. If the program bombs

a. Look for some type of flag system. IE: storing a special value in memory, setting of the carry bit, etc.

b. Scan for references to the flag/memory location.

E. Insert the BREAK trick (See COMPUTIST #61, pg 9-10; Mavis Beacon).

a. Find where the call was made and check the surrounding code for references to a flag (memory or Carry bit, etc.).

b. Disable there if possible.

7. Once you have deprotected a program.

A. Kick back and relax for awhile.

B. Enjoy the newly deprotected program.

C. MOST IMPORTANT:

a. Organize your notes.

b. Write an article with as much information as possible.

c. SEND IT IN TO COMPUTIST for the rest of us to read.

Please keep in mind that these are very general hints. I keep all these things in mind when I go to krack a new program. I have come to expect certain protection schemes from certain companies. In fact, I was disappointed when I checked Sub Battle Simulation (Epyx), Police Quest (Sierra), and Mixxed up Mother Goose (Sierra) and found NO protection.

A personal comment: Some protection schemes provide me with more fun than the actual game/program.

By far, I find the CODE protection the most challenging and effective mode of copy protection. I also find this type of protection the most annoying, that's why I'm willing to spend 4 or more hours hunting it down! However, I have recently come across a few good deprotection proceedures I will pass along in the near future!

Most of the information I have given in this article is very brief. If I had the time, I would write it out as several pages with much more detail. In the future, I will write examples on using the above proceedures that will be much more specific.

Well, I hope this will help someone when they go to deprotect a program.

Softkey for...

Pirates! GS

Micro Prose

■ **Requirements**

☐ Apple IIgs 256K
☐ File transfer program
☐ Preformatted disk

Thanks to Dan Halfwit (COMPUTIST #61, pg. 8), I was able to make a deprotected copy of Pirates! GS. This article borrows heavily from his work and shows a slightly different method for those people without access to the monitor.

Due to the way ProDOS runs, the second disk (you insert after the break) can be named anything. Also, ProDOS will run the first program it finds with the suffix ".SYSTEM", so you could just have UTIL.SYSTEM (Copy II+) on the disk. In addition, I was also able to find a way to put any normal ProDOS on the disk, too.

Capturing Pirates's ProDOS: Enter the monitor and type in the following commands to move the boot code ROM to RAM and reroute the JMP $801

```
CALL-151
9500<C500.C600M
9573:4C 00 96              was JMP 801 (4C 01 08)
9600:A9 59 8D CD 09 A9 55 8D
9608:CE 09 4C 01 08
9500G
```

What the code at $9600 does is, changes the encrypted JMP $2000 to an encrypted JMP $FF59, which is, of course, the monitor entry point. Entering the 9500G will load the ProDOS from the Pirates disk and then you will be dumped into the monitor.

Now you should eject the Pirates disk and insert your disk with UTIL.SYSTEM as the first file. Then type "2000G" to get the ProDOS in memory running. Simply copy the files off the protected disk to a disk with the volume name "/PIRATES". The best thing at this point is to have two disk drives, although it's not required, it greatly speeds things up. When that's all done, search the disk for 8D 20 B1 A2 00 and change the 8D 20 B1 to 60 EA EA, as in Mr. Halfwit's article.

I then loaded the PIRATES.SYSTEM file into memory and checked it to find out why it wouldn't accept a different ProDOS version. I came across the following:

```
2034:AD FF BF  LDA BFFF          Load ID byte
2037:C9 04     CMP #04           Compare to known value
2039:F0 0F     BEQ 204A (+0F)    Equal, then continue
203B:AD 30 BF  LDA BF30          Load last slot accessed
203E:4A        LSR
203F:4A        LSR
2040:4A        LSR
2041:4A        LSR               Divide by 16
2042:09 C0     ORA #C0           Change to Cx, x=slot
2044:8D 49 20  STA 2049          Chg JMP 0000 to JMP Cx00
2047:4C 00 00  JMP 0000          Changable reboot
204A:A9 00     LDA #00           Continue
```

So, to add any version of ProDOS 8 type the following commands from BASIC:

```
CALL-151
BLOAD PIRATES.SYSTEM,A$2000,TSYS
2039:80
BSAVE PIRATES.SYSTEM,A$2000,TSYS
```

You can now add the latest version ProDOS you have. Also, the built in ProDOS quit routine works without problems. I was able to launch the system file from Finder, play the game, and return to finder when I quit! Has anyone found a way to skip over the manual check? That's the part where they ask you where the "silver train" will be and when. Thanks again Dan.

Softkey for...

Mini-putt
Accolade

■ Requirements

☐ Apple IIgs 512K
☐ 3½" disk copier
☐ 3½" disk editor

I would like thank Jim S. Hart for his help in kracking Mini-putt.

Mini-putt (MP) is a miniture golf game put out by the same company that released Mean 18 golf. The game comes with 4 built in courses on the disk, however, unlike Mean 18, you cannot design your own courses. MP comes on a single 3½" disk and Accolade has used the commercial nibble count protection scheme for this release. I first made a copy of the MP disk and received no errors, then, when booting the disk, I was asked for the original. So I got out my disk scanning program (actually Copy II+ v8, BC3.SYSTEM's sector editor) and searched the disk for A2 20 A0 01. I was able to locate the nibble counting routine on block $3A and it looks like this (on the disk):

```
1A7:E2 30       SEP #30          8-bit wide Accum.
1A9:A2 20       LDX #20          Track $20
1AB:A0 01       LDY #01
1AD:22 A8 03 00 JSL 0003A8       Go do the nibble count
1B1:B0 18       BCS 1CB (+18)    Carry set means
                                 fail/copy
1B3:8E 95 F3    STX F395         Store first half of nibble
                                 count sum
1B6:8C 96 F3    STY F396         Store the second half
1B9:A2 21       LDX #21          Track $21
1BB:A0 01       LDY #01
1BD:22 A8 03 00 JSL 0003A8       Go do the nibble count
1C1:B0 08       BCS 1CB (+08)    Carry set means
                                 fail/copy
1C3:8E 97 F3    STX F397         Store first half of nibble
                                 count sum
1C6:8C 98 F3    STY F398         Store the second half
1C9:80 04       BRA 1CF (+04)    Always go to the
                                 compare code
1CB:C2 30       REP #30  Switch to 16-bit wide Accum.
1CD:38          SEC      Set the carry for a fail/copy
1CE:6B          RTL              Return to the sender
1CF:C2 30       REP #30          16-bit wide Accum.
1D1:AD 95 F3    LDA F395 Load nibble count sum for
                                 track $20
1D4:C9 6C 20    CMP #206C        Compare to low end
                                 benchmark
1D7:90 F2       BCC 1CB (-0D)    If too low, goto fail
                                 & return
1D9:C9 03 21    CMP #2103        Compare to high end
                                 benchmark
1DC:B0 ED       BCS 1CB (-12)    If too high, goto fail
                                 & return
1DE:AD 97 F3    LDA F397 Load nibble count sum for
                                 track $21
1E1:C9 B0 1D    CMP #1DB0        Compare to low end
                                 benchmark
1E4:90 E5       BCC 1CB (-1A)    If too low, goto fail
                                 & return
1E6:C9 79 1E    CMP #1E79        Compare to high end
                                 bench mark
1E9:B0 E0       BCS 1CB (-1F)    If too high, goto fail
                                 & return
1EB:18          CLC      Got this far, must be an original
1EC:6B          RTL              Return to sender
1ED:E2 30       SEP #30  Start of the nibble count
                                 routine
1EF:18          CLC
1F0:8E 98 F3    STX F389         Store track number
1F3:8C 8A F3    STY F38A         Store side
1F6:5A          PHY              Push side on stack
1F7:DA          PHX      Push track number on stack
1F8:F4 00 00    PEA 0000
1FB:F4 8C F3    PEA F38C         More data at F38C
1FE:22 C1 00 00 JSL 0000C1       Count them up
002:8D 8B F3    STA F38B Store result for minute
005:68          PLA
006:68          PLA
007:68          PLA
008:68          PLA
009:68          PLA
00A:68          PLA      Pull all extra values of the stack
00B:AD 8B F3    LDA F38B         Reload the result
00E:6B          RTL              Return to the sender
```

The quickest way around this disk check would be to change the LDX #20 (A2 20) at 1A9 to BRA 1CB (80 20), then change the SEC (38) to CLC (18) at 1CD. Now, the routine branchs down to code that sets up a 16 bit wide accumulator, clears the carry (setting the flag for a pass condition), and then returns to the sender. This approach works fine and produces a working version of the original. The only step I added was to find the call (or calls in this case) to the above routine and edit the disk there. Back on block $7 (the first block of the game file) there are two calls to nibble count. If the first call is returned as a pass, then MP branches over the second call to start the game. However, if the first attempt fails, the code falls through and asks you to insert the original, then the second call is made to nibble count. If the second call fails, then it loops back to the insert original section, then back to itself. It looks like this (on the disk):

```
11B:22 62 03 00 JSL 000362       Check for original disk
11F:B0 03       BCS 124 (+03)    Carry set means it's
                                 a copy
121:82 BE 00    BRL 1E2 (+0BE)   It's the original,
                                 start the game
```

124 - 1D9 is the "Insert Original" routine

```
1D9:22 62 03 00 JSL 000362       Check for the original
                                 again
1DE:90 02       BCC 1E2 (+02)    Carry clear for an
                                 original
1E0:80 C8       BRA 1AA (-37)    Go back and ask for
                                 the original
```

1E2 - is "start the game" code.

So, from here the krack becomes very easy. Change the JSL (22) to LDA (AF) and the BCS 124 (B0 03) to NOP CLC (EA 18). Now MP will boot right into the game and will no longer insist you use the original disk. The one thing I noticed after I made the patch was you can play Mini-putt from your hard drive, unlike Mean 18 golf, which has the disk volume hard coded in the program.

1 Make a copy of the Mini-putt disk.

2 Edit the copy.

Block	Byte(s)	From	To
$7	$11B	22	AF
	$11F	B0 03	EA 18
Optional:			
$7	$1DA	22	AF
	$1DE	90 02 80 C8	EA EA EA 18
$3A	$1A9	A2	80
	$1CD	38	18

Don't forget to write the blocks back to the copy. Store the original in a safe place. Optional: upload the program to your hard disk

Softkey for...

Zany Golf
Electronic Arts

■ Requirements

☐ Apple IIgs 512K
☐ 3½" disk copier
☐ 3½" disk editor

Zany Golf (ZG) is a crazy miniature golf game with nine new and imaginative hole designs. The game has very nice graphics and it's easy to play using the mouse. ZG is written by Will Harvey and Jim Nitchals (along with Ian Gooding and Doug Fulton) who wrote Music Construction Set (MCS) GS and Marble Madness (MM) GS.

The program is published by Electronic Arts (EA) and the copy protection is based on two other programs written by Will and Jim. Some of the other simularities, other than running under ProDOS 8, include the use as DOS8.SYSTEM for the hello program (like MM), and the file called CODE (for MCS is was JIMSCODE), which contains the protection routines.

The protection used for the three above programs is nibble counting on tracks $20 and $21 on the 3½" disk. Searching for A2 20 A0 01 would NOT work for any of these programs. Electronic Arts uses a routine that has data stored after each call. When a call to the nibble count is made, another routine gets the stack location of the call. This second routine proceeds to extract the data and change the return value to skip over the data. I have included the complete dissassembly so you can

see what the routine looks like. EA has used the exact same routine on all three GS releases; only the absolute addresses change. A new scan sequence for EA programs would be 21 01 B0 31 86 00 84 01 and 20 01 B0 14 86 02 84 03. I was able to find this routine on all three of the above programs. The routine looks like this:

```
00:8B       PHB
01:4B       PHK
02:AB       PLB
03:08       PHP
04:C2 30    REP #30          16-bit wide Accum
06:7B       TDC
07:8D 2C 36 STA 362C
0A:A9 00 00 LDA #0000
0D:5B       TCD
0E:E2 30    SEP #30          8-bit wide Accum
10:20 2E 36 JSR 362E  Go do the nibble count routine
13:B0 0C    BCS 21 (+0C)  Carry set = pass/original
15:68       PLA              Fail if we come this far
16:68       PLA
17:68       PLA              Pull values of the stack
18:A9 00    LDA #00          Load zero
1A:48       PHA
1B:48       PHA              Push it on the stack
1C:48       PHA              To hide where it came from
1D:DC 21 36 JML (3621)       Jump long through 3621
                             -=BOMB=-
20:00       00
21:18       CLC              It's an original, so return
22:FB       XCE              Change to full IIgs mode
23:C2 30    REP #30          Switch to 16-bit wide Accum
25:AD 2C 36 LDA 362C
28:5B       TCD
29:28       PLP
2A:AB       PLB
2B:6B       RTL              Return to caller
2C:00 00        0000         Storage area for $362C
2E:38       SEC              Set up to return to IIe mode
2F:FB       XCE              Return to IIe emulation mode
30:20 03 37 JSR 3703         Routine that does all the work
33:00 10        1000
35:6D 36        366D         Data stored at $366D
37:21 01        0121         Track $21, side 1
39:B0 31    BCS 6C (+31)  Carry set means fail/copy
3B:86 00    STX 00        Store half of the nibble count sum
3D:84 01    STY 01           Store the other of the sum
3F:E0 B0    CPX #B0
41:98       TYA
42:E9 1D    SBC #1D       Compare to low end (1DB0)
44:90 28    BCC 6E (+28)  If too low, then goto error
                             & return
46:E0 78    CPX #78
48:98       TYA
49:E9 1E    SBC #1E       Compare to high end (1E78)
4B:B0 23    BCS 70 (+23)  If too high, then goto error
                             & return
4D:20 03 37 JSR 3703         Routine that does all the work
50:00 10        1000
52:6D 36        366D         Data stored at $366D
54:20 01        0120         Track $20, side 1
56:B0 14    BCS 6C (+14)  Carry set means fail/copy
58:86 02    STX 02        Store first half of nibble count sum
5A:84 03    STY 03        Store the second half of the sum
5C:E0 6C    CPX #6C
5E:98       TYA
5F:E9 20    SBC #20       Compare to low end (206C)
61:90 0B    BCC 6E (+0B)  If too low, then goto error
                             & return
63:E0 02    CPX #02
65:98       TYA
66:E9 21    SBC #21       Compare to high end (2102)
68:B0 06    BCS 70 (+06)  If too high, then goto error
                             & return
6A:38       SEC           Made it this far, must be an original
6B:60       RTS           Now return to the sender
6C:18       CLC           Had errors during nibble count
6D:60       RTS           But return anyways
6E:18       CLC           Sum too low, must be a copy
6F:60       RTS           Go ahead and return
70:18       CLC           Sum too high, must be a copy
71:60       RTS           Still return to caller
```

The above routine starts at $3600, so searching for 22 00 36 would reveal any calls to the protection. After searching the whole disk, I found only one call and it looked like this (on the disk at Block $5D):

```
107:8D 09 61    STA 6109
10C:AD 06 42    LDA 4206
10F:C9 08       CMP #08
111:D0 04       BNE 117 (+04)
113:22 00 36 00 JSL 003600
117:AD 06 42    LDA 4206
11A:8D 0A 42    STA 420A
```

Changing the BNE 117 (D0 04) to BRA 117 (80 04) and the JSL (22) to LDA (AF) resulted in a kracked version of Zany Golf.

1 Make a copy of the Zany Golf disk.

2 Edit the copy.

Block	Byte(s)	From	To
$5D	$111	D0	80
	$113	22	AF

Don't forget to write the block back to the copy.

IIgs Softkey for...

Mavis Beacon Teaches Typing v1.5

Software Toolworks

■ Requirements

☐ Apple IIgs 512K
☐ 3½" Disk copier
☐ 3½" Disk editor

The softkeys that appeared in COMPUTIST #60 (pg 18-19, by Stephen Lau) an my own article in COMPUTIST #61 (pg 9-10) were for version 1.2. Software Toolworks has now released version 1.5, however, they used the same protection on this release. Only the actual blocks have changed, but the same bytes are present. Use my article for reference and an explanation of the protection.

To find the first sets of edits, scan the disk for C9 00 00 F0 06 A9 00, then follow the code and make the correct changes from there. To find the second set of edits, scan the disk for F4 3A 06 F4 00 00 22 (was F4 3A 06 F4 01 00 22 for version 1.2), then match it up with the dissassembly in my article. For the last set of edits, scan for the dissassembly I showed, but without the absolute addresses. That is scan for 7A 8E 00 00 8D 00 00 22 00 00 00 ... instead of 7A 8E 79 09 8D 77 09 22 8E 6C 03 etc. NOTE: In COMPUTIST #62 (p. 18), Dr. Leigh Rowan-Kelly's article for v1.5 states that MBTT "does not like being run from a hard disk." The reason for this is the protection code checks the disk it's run from. If they had backed up 7 bytes and changed the 22 to an AF then the program disk (not the data disk) could be uploaded. I know this for a fact, as I have done it with versions 1.2 & 1.5. To crack MBTT, v1.5 use one or all of these edits:

1 Make a copy of the program disk, ignore errors.

2 Edit the copy.

Block	Byte(s)	From	To
$A	$31	22	AF
	$3A	C9 00 00 F0 06	EA EA EA EA EA
		A9 00	A9 01
	$78	22	AF
	$81	C9 00 00 F0 06	EA EA EA EA EA
		A9 00	A9 01
	$A6	22	AF
	$AF	C9 00 00 D0 05	EA EA EA EA EA
		A9 00	A9 01
	$D3	22	AF
	$DC	C9 00 00 F0 05	EA EA EA EA EA
		A9 00 00 80 03	EA EA EA EA EA

OR

Block	Byte(s)	From	To
$3E	$10C	22	AF
	$113	D0	80

OR

Block	Byte(s)	From	To
$142	$18F	22	AF

Don't forget to write the blocks back to copied program disk.

IIgs Softkey for...

Showoff v1.1

Broderbund

■ Requirements

☐ Apple IIgs 512K

☐ 3½" disk copier
☐ 3½" disk editor

The articles in COMPUTIST #60 (pg 9, by Stephen Lau) and my own in COMPUTIST #56 (pg 15-16) were for version 1.0 of Showoff. Broderbund has released a new version 1.1, but has used the EXACT same protection routine. The ONLY difference is the location, the routine has been moved forward by one block. For a complete listing (and description) of the protection routine, read my previous article. To crack version 1.1 try:

[1] Make a copy of the program disk and slide show disk.

[2] Edit the copy of the program disk.

Block	Byte(s)	From	To
$17D	$70	08	60

[3] Write the block back to the disk.

IIgs Softkey for...

Math Wizard
Unicorn Inc.

■ Requirements

☐ Apple IIgs 768K
☐ 3½" disk copier
☐ 3½" disk editor

Math Wizard (MW) is another educational program by Unicorn that uses the same protection as all the other Unicorn programs. For an example of the protection along with the dissassembly refer to COMPUTIST #56 (pg. 17, Aesop's Fables) and COMPUTIST #61 (pg. 10-11, Magical Myths & Tales from the Arabian Nights). MW comes on two 3½" disks and does a nibble count on disk, one before the program begins. Like all the Unicorn programs I have seen, searching for A2 21 A0 01 reveals the nibble counting routine. Also, like the other six programs before MW, changing the A2 21 to 80 2C results in a deprotected backup.

[1] Make a copy of both disks.

[2] Edit the copy of disk 1 only.

Block	Byte(s)	From	To
$4F8	$0B	A2 21	80 2C

IIgs Softkey for...

World Tour Golf
Electronic Arts

■ Requirements

☐ Apple IIgs 512K
☐ 3½" Disk copier
☐ 3½" Disk editor

World Tour Golf (WTG) is a golfing simulation game somewhat like Mean 18 Golf (by Accolade). There are several courses on the disk and the game is a little more complicated than Mean 18. This program uses a manual check type of protection for it's copy protection. Before the game starts, you are shown a part of a hole and you have to refer back to the manual, then type in the correct course name. The only problem is, I can't really show you how to track these down. I had to go into the game, and try to follow the code until I figured out the right edits. So, I only have a disk edit and no dissassembly, sorry. To take out the course check try this:

[1] Make a copy of the disk.

[2] Edit the copy.

Block	Byte(s)	From	To
$17D	$141	0B	6B
$188	$74	22	AF

Jim Heil

Softkey for...

Spanish Facts for Fun and Practice
D.C. Heath and Company.

[1] Both sides of the startup disk are protected with address epilogs changed to DE DE. So, copy tracks $00-22 with any program you like. I used Super IOB.

[2] Edit side 1.

Trk	Sct	Byte(s)	From	To
$18	$00	$03-05	EA EA EA	4C D4 20

This sector edit stops the program from looking at track $23 for sync info.

Softkey for...

Maxi Golf
Thunder Mountain.

[1] Copy both sides with any copier ignoring the errors on track $22 of side 1.

[2] Edit the copy.

Trk	Sct	Byte(s)	From	To
$1A	$09	$24-26	A9 02 8D	4C 82 1D

This sector edit stops the program from looking at track $22 for sync info.

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Explore-Australia Dataflow Computer Service
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Impossible Mission II Epyx
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57 1988 ✎ *Features:* •Electronic Art's Protection Language •How to find hidden code with EOR DiskScan •Here's another look at •Lower Case & Infocom Games •Monsters of Might & Magic •A Character Editor for Rings of Zilfin •A Single Data Disk for all your Print Shop Graphics •The Product Monitor ✎ *Softkeys:* •American Challenge •Arctic Fox •Bard's Tale II •BoulderDash Construction Set •California Games •Championship Wrestling •Chief of Detectives/Drawing Conclusions •Deep Space •Dome Simplified Bookkeeping System •Dr. Ruth's Computer Game of Good Sex •Earth Orbit Stations •Factory •Galaxy Search/Predicting Outcomes •Game Maker •Hacker II •Hardball IIgs •Ikari Warriors •Labyrinth •Marble Madness •Master Diagnostics IIe •Math Blaster •Mickey's Space Adventure •Micro-Computer Learning Games •Microzine #14 •Microzine #24 •Milliken Math Series •Mind Prober •M-ss-ng L-nks •Morning Star Spelling •Mountain Climbing/Cause and Effect •Movie Monster Game •Pond •Race Track/Reading for Detail •Reading Comprehension Main Idea & Details •Rings of Zilfin •Roadwar 2000 •School Days/Inference •Ski Crazed •Softswitch •Sub Mission •Time Capsule/Reading Skills •Tuesday Morning Quarterback •Typewriter •Where in Europe is Carmen Sandiego •Wortgefecht •Xevious ✎ *APTs:* •Deep Space •H.E.R.O. •Moebius •Rings of Zilfin •Roadwar 2000 ✎ *Playing Tips:* •Arcticfox •Castle Wolfenstein •Conan •Donkey Kong •Ultima IV IBM *Softkeys:* Symphony v1.00 •TK!

56 1988 ✎ *Features:* •Apple IIgs Secret Weapon •5 second fastboot into Locksmith 6.0 Fastcopy •The Product Monitor •Taking the grind out of Championship Wrestling •Making some improvements to The Nibbler ✎ *Softkeys:* •2400 AD •40' Graphics Studio •Accolade Comics •Aesop's Fables •American People •Animal Hotel •Applewriter IIe •Arcade Album #1 •Arctic Antics •Ballblazer •Bard's Tale II: The Destiny Knight •Bard's Tale IIgs •Cat'n Mouse •Championship Wrestling •Charlie Brown's 1,2,3's •Cobra Cavern •Color Me •Create With Garfield •David Winfield's Batter Up! •Destroyer •Disk Optimizer II •Dragonworld •Electronic Arts Software •En Vacances •En Ville •Fantavision gs •Fight Night •Forbidden Castle •G.I. Joe •Garfield Double Dares •General Manager •Goonies •GraphicWriter 2.0 •Gutenberg, Sr. •Hacker II •Hardball •Hardball gs •Infiltrator •James Bond 007: A View to a Kill

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55 **May 1988** ✹ *Features:* •A Utility to Save the Lower 8 Pages of Memory •Bard's Tale Effects Locator •How to Capture Phantasie Screen Maps •Alternate Reality Character Editor •Updating the ProDOS Block Editor •Loading Flashcalc onto your RAMcard •A Copy-protection Scheme for ProDOS •The Product Monitor •Autoduel Car Editor ✹ *Softkeys:* •Alphabet Sequencing •Animal Alphabets and Other Things •Arctic Antics •The Boars' Store •The Boars Tell Time •Career Focus •Castle Wolfenstein •Charlie Brown's 123's •Charlie Brown's ABC's •City Country Opposites •Coveted Mirror •Create With Garfield •Crypt of Medea •Customized Alphabet Drill •Customized Flash Spelling •Dig Dug •Digital Paintbrush System •Estimation •Fay: Word Hunter •Fix It •Focusing on Language Arts •Fundamental Capitalization •Fundamental Punctuation Practice •Fundamental Spelling Words in Context •The Hobbit •Homonyms in Context •Individualized Study Master •Inside Outside Shapes •Inside Outside Opposites •Leisure Suit Larry in the Land of the Lounge Lizards •Master Diagnostics II & II+ •Mastertype v2.1 •Mathematics Series •Mr. and Mrs. Potato Head •Paper Models - The Christmas Kit •Peanuts Math Matcher •Peanuts Maze Marathon •Peanuts Picture Puzzlers •Perry Mason: The Case of the Mandarin Murder •Railroad Works •Random House Library •Management Programs •Rocky's Boots v.4 •Sensible Speller •Snoopy's Reading Machine •Snoopy's Skywriter Scrambler •Snoopy to the Rescue •Snoopy Writer •Spelling Demons •Stock Market Simulation •Story Builder •Story Starter •Studio II •Test Maker •Think Quick v1.0 •Tournament Bridge •Tutorial Comprehension •Typing is a Ball, Charlie Brown •Under Fire •Word Blaster •Word Count •Word Mount •Your Personal Net Worth ✹ *APTs:* •Under Fire **IBM***Feature:* •Flight Simulator RGB Modifications

54 **April 1988** ✹ *Features:* •Picture Loader •How To Make DEMUFFIN PLUS •Convert Print Shop graphics into Print Master graphics •lower case letters For Your Apple II Plus •The Product Monitor •Apple IIc Paddle Fix •Softkey for Daisy Professional 'Most-Protected' Award •DOS EOR Maker ✹ *Softkeys:* A2-PB1 Pinball •Animate •Bank Street Music Writer •Boulderdash Construction Kit •California Games •Countdown to Shutdown •Coveted Mirror •Create with Garfield •Daisy Professional •Destroyer •Donkey Kong •Expedition Amazon •General Chemistry Disk #8 •Graphics Studio •Green Globs & Graphic Equations •Kalamazoo Teacher's Record Book 2.0 •Kids on Keys •Marble Madness •Math Blaster •Maxwell Manor •Peanut's Maze Marathon •Petro-Calc •Police Artist •Practical Grammar •Rendezvous •Ring Quest •Roadwar Europa •Roadwar 2000 •Rocky Horror Show •Sesame Street Electric Coloring Book Series •Sesame Street Letters for You •Sesame Street Numbers •Seven Cities of Gold •Snoopy's Reading Machine •Spy's Adventures In Europe •Spy's Demise •Super Sunday Football •Talisman •Tellstar II •Top Draw v1.01A •The American Challenge •The Dam Busters •The Science Professor •Tubeway •Vocabulary Adventure I •Winter Games •Wizards' Crown •Zero-Gravity Pinball ✹ *APTs:* •Expedition Amazon •Might and Magic ✹ *Playing Tips:* •Beauracracy •King's Quest II •Lurking Horror •Maniac Mansion •Stationfall **IBM** *Feature:* •Introduction to IBM Disk Format, Access, and Copy-protection •Putting Sargon III on harddisk **IBM** *Softkeys:* •Prokey 3.0 •R:base 400 •Time Manager

53 **March 1988** ✹ *Features:* •Modify Super IOB to read/write every other track •APT for Rings Of Zilfin: Turn yourself into a lean, mean fighting Machine •More Softkeys for M.E.C.C. software (1987) •How To Use The Electronic Art's RWTS •APT for Realms Of Darkness: Realm's Wrecker! •Putting Super Boulder Dash onto a hard disk ✹ *Softkeys:* •2400 A.D. •Age Of Adventure •Apple's Core II •Arcade Boot Camp •Arctic Fox •Aztec •Ballblazer •Bard's Tale IIgs •Blue Powder Gray Smoke •California Games •Championship Wrestling •Colonial Conquest •Comprehension Skills I,II •Conquering Whole Numbers •Coordinate Math •Countdown To Shutdown •Dataquest: The World Community •Destroyer •Dream House •Dream Zone •Earth Orbit Station •Equation Math •Forecast: Your At-Home Weather Station •Fraction Concepts Inc •Fraction Munchers •Fraction Practice Unlimited •GBA Championship Basketball •Genesis •GFL Football •Ghost Rider •Goonies •Grade Manager v2.3 •Great American Cross-country Road Race •Hardball IIgs •Ikari Warrior •Jenny's Journeys •Kid Niki Radical Ninja •Kung-Fu Master •Learning To Tell Time •Leisure Suit Larry •Let's Learn About Money •Let's Learn About The Library •Letters For You •Lords Of Conquest •Magic Spells •Math Blaster •Money Works •Maps & Globes: Latitude & Longitude •Marble Madness •Microzine 18,19,20,21,22,23 •Mist •Morning Star Math •Movie Monster Game •Multiplication Puzzles •Multiscribe v3.0c •Murder On The Mississippi •Music Made Easy •Mystery Sentences •Number Munchers •Numbers Count •Odell Lake •Operation Frog •Opposites Attract •Oregon Trail v1.4 •Phonics Prime Time: Blends & Digraphs •Phonics Prime Time: Vowels I, II •Puzzles & Posters •Quotient Quest •Reader Rabbit •Reading Style Inventory •Realm Of Impossibility •Sesame Street 'Crayon' series •Shanghai •Sons Of Liberty •Space Quest v2.2 •Story Book: Pixelworks •Story Tree •Subtraction Puzzles •Super Huey •Super Wordfind •Tass Times In Tonetown •Those Amazing Reading Machines III, IV •Timothy Leary's Mind Mirror •To Preserve, Protect and Defend •Tower Of Myraglen •Troll's 'MicroCoarseware' series •Webster: The Word Game •Word Munchers •Words At Work: Compound It •Words At Work: Suffix Sense •World Games •World's Greatest Baseball Game •World Karate Championship •Writer Rabbit •Zoyon Patrol ✹ *APTs:* •Buck Rogers •Ikari Warrior •Kung-Fu Master •Leisure Suit Larry IIgs •Marble Madness •Realm Of Darkness •Rings Of Zilfin •Space Quest IIgs •Super Boulder Dash ✹ *Playing Tips:* •2400 A.D. •Donkey Kong •Infiltrator •Space Quest IIgs •Spy Hunter •Swashbuckler •Thexder •Ultima II • **IBM** *Softkeys:* •EasyWriter 1.0, II •Zork III

52 **February 1988** ✹ *Features:* •The Product Monitor •Unprotecting The Unprotectable: MacIntosh Softkeys! •A.P.T. Cornucopia •APT:Alternate Reality-Dungeon: Create A Super-human •Softkey for SSI's RDOS disks: 1.ProDOS RDOS, 2.RDOS Transfer Utility •Making Cracked II Plus Disks Work On The IIc ✹ *Softkeys:* •Apple Gradebook v2.6 •Award Maker Plus •Black Cauldron •Black Magic •California Games •Car Builder •Color Print Shop •Computer Ambush •Concepts In Science •Disney's Comic Strip Maker •Elite •Empire I, II •European Nations & Locations •Fooblitsky •Grid Designer •H.E.R.O. •Ikari Warriors •Infiltrator II •Le Francais par Ordinateur •Little Computer People's House on a Disk ★Main Street Filer •Master Diagnostics IIe ★MegaFiler ★MegaMerge •Microzine 23 •Might & Magic ★Millionaire •Mindplay software •Music Construction Set •Nibbler •Operation Market Garden •Phantasie ★Planetfall •PrintMaster Plus •Print Shop •Questron •Regatta •Ring Quest •Ringside Seat •Rings Of Zilfin •Shanghai •Silent Service •Snooper Troops •Spy's Adventure in N. America •Super Print •Tass Times In Tonetown •Think Quick ★Transylvania •Ultima I re-release •Where in the USA is Carmen Sandiego •World Games ★Zork I (★*MacIntosh softkey*) ✹ *A.P.T.s:* Alternate Reality: The Dungeon •Arctic Fox •Bard's Tale II •Beyond Zork •Black Magic •Cavern Creatures •Drol •Goonies •Ikari Warriors •Zorro ✹ *Playing Tips:* •Beyond Castle Wolfenstein •Championship Lode Runner •Conan •King's Queen II •Lode Runner •Lurking Horror •Station Fall •Ultima IV •Zork **IBM** *Softkeys:* •Lotus 1-2-3 •Flight Simulator •PFS Report **IBM** APTs: •Bard's Tale

51 **January 1988** *Features:* •The Crypt-arithmetic Helper •Using EDD IV to Modify Tracks And Sectors •Bard's Tale APT: Dungeon Mapper Revisited •RAMfactor mod for Laser 128 •Ultima IV APT edit-tables •The Product Monitor •Get Better Sound by using the cassette jacks •Making A Fast Boot Disk •Might & Magic APT edit-tables *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 *A.P.T.s:* Bard's Tale •Lode Runner •Might & Magic •Ultima IV •W. Disney's Card And Party Shop •Wizardry III •Wizardry IV *Playing Tips:* •Autoduel •King's Quest •Manic Mansion •Summer Games •Tass Times In Tonetown •Thexder •Where In the World is Carmen Sandiego?

50 **December 1987** *Features:* •Super Boulderdash APT-writer •Softkeys to Activision/ MECC/ and PFS ProDOS/ software •Double F-8 ROM space w/o motherboard surgery •Ace-Apple bimodal Switch •Using Sider hard drives 3½", 800K drives, & 5¼" drives in DOS 3.3 *Softkeys:* •Aliens •Alter Ego •Alternate Reality •Amazing Reading Machines •Amazon •American Challenge •Arcade Album #1 •Arithmetic Critters •Award Maker •Baseball Database •Bard's Tale II: Destiny Knight •BC's Quest for Tires •Bop & Wrestle •Champ. Boxing •Champ. Wrestling •Clock Works •Commando •Computer Prep for SAT •Conflict In Vietnam •Counting Critters •Crisis Mountain •Dataquest 50 States •Deluxe Paint II •Dino Eggs •Disney Card & Party Shop •Disney Comic Strip Maker •Draw Plus •Eidolon •Electric Crayon ABCs •Expedition Amazon •Facemaker •First Letter Fun •Fish Scales •Fun From A--Z •Game Maker •GBA Champ. Basketball •GFL Champ. Football •Graphicwriter 1.0R/1.1R •Great Road Race •Hacker II •Hardball •Infiltrator II •Instant Music •James Bond 007: A View To A Kill •Jenny's Journeys •Kung Fu Master •Little People •List Handler •Manic Mansion •Mastery Arithmetic Games •Market Place •Master of Lamp •Math Rabbit •Microzine #17 •Might and Magic •Mission In Solar System •Moebius •Music Construction Set •Music Studio •Number Munchers •Paint With Words •Paintworks Plus •Path Tactics •pfs:File •pfs:Graph •pfs:Plan •pfs:Report •pfs:Write •Phonics Prime Time •Portal •Principal's Assistant •Print Shop ProDOS 8 v1.4 •Print Shop Holiday Edition •Quickflash! •Reader Rabbit •Realm of Impossibility •Robot Odyssey I v.2.0 •Rocky Horror Show •Rocky's Boots v4.0 •Saracen •Shanghai •Silent Service •Skylab •Sound Tracks •Speedy Math •Spindizzy •Street Sports Baseball •Sub-Mission •Super Boulderdash •Tass Times in Tonetown •Thexder •Top Fuel Eliminator •Word Handler •Word Munchers •Words at Work •World Karate Champ. •Writer's Choice: Elite •Zardax v5.2.1

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48 October 1987 *Features:* •Dungeon Editor & Encounter Editor for Ultima III *Softkeys:* •816 Paint GS •Amnesia •Apple Business Graphics •Arctic Fox •Award Maker Plus •Bard's Tale II •Betterworking Word Processor •Beyond Castle Wolfenstein •Black Magic •Bookends Extended •Bop & Wrestle •Chess 7.0 •Chessmaster 2000 •Deluxe Paint GS •Destroyer •Hacker II •Hacker II GS •Hardball •Infiltrator •Instant Music GS •J-Bird •Mabel's Mansion •Marble Madness •Mean 18 GS Golf •Megabots •Might & Magic •Miner 2049er II •Mouse Word •Music Construction Set GS •Music Studio GS •New Oregon Trail •Paintworks Plus 1.0 GS •Paintworks Plus 1.0 GS •Paul Whitehead Teaches Chess •PHM Pegasus •Poetry Express •Print Shop color version •Rambo: First Blood part II •Rocky Horror Show •Sargon III* •Shadowkeep •Shanghai GS •Spindizzy •TelePorter •Temple Of Apshai trilogy •Top Draw GS •Transylvania •Ultima I •World's Greatest Baseball Game *APTs:* •Shadowkeep

47 September 1987 *Features:* •Infocom-text Reader Enhancement •Color Ultimapper mod to Ultimapper IV •Towne Mapper utility for Ultima IV •Dungeon Mapper utility for Bard's Tale *Hardware Corner:* Interrupting Your Apple •Softkey for Charlie Brown's 1,2,3s *Softkeys:* •Guitar Wizard •Gemstone Warrior •Notable Phantom •Micro Wine Companion •Stickybear Printer •Note Card Maker •Starcross •Wishbringer •Dinosaur Dig •Dam Busters •Pirate Adventure •Infiltrator •MECC software •Banner Catch •Turtle Tracks •PFS File •Microzine #12, #13, #14 •Marble Madness •Writer Rabbit •Arcticfox •Age Of Adventure •Might And Magic •Space Station •Alternate Reality •Mindshadow •Gemstone Warrior •Strip Poker •Lucifer's Realm •Manuscript Manager •Bank Street Writer III •Kids On Keys •The Missing Ring •Graphic Solution •Empire I, II •Champ. Golf

46 August 1987 *Softkeys:* •Advanced Microsystems Technology programs •Word Attack •Star Blazer •Science Toolkit •The Color Enhanced Print Shop •Video Vegas •The Handlers •K.C. Deals On Wheels •Law Of The West •Break The Bank Blackjack •Foundation Course In Spanish •OGRE •Puzzles And Posters *Features* •The Shift Key/Lower Case Option For II+ •Amazing Computer Facts •Shape Magic utility *Review:* Multiscribe

45 July 1987 *Softkeys:* •Mouse Calc •Sands of Egypt •Number Farm •Agent U.S.A. •Wavy Navy •Kindercomp •Flight Simulator Update •Raid over Moscow •Crime Stopper •Key Perfect 5. •The Final Conflict •Miss Mouse •Snoggle *Features* •Write Protecting the Microsoft RAM Card •Keys to Success on the Franklin Ace •Modified F8 ROMs on the Apple *III Core* •Owner's Review of Copy Master II

44 June 1987 *Softkeys:* •Arcade Boot Camp •Goonies •Zorro •Coveted Mirror •Crimson Crown •Compubridge •Fleet System 3 •Microwave •Escape •Catalyst 3.0 •Number Farm •Alphabet Circus •Joe Theisman's Pro Football •Black Cauldron •Intern. Gran Prix *Features* •Making DOSless Utilities •Pixit Printer Drivers *Review:* Z-RAM Memory Expansion Board •Reading the Joystick

43 May 1987 *Softkeys:* •Graphics Expander •Information Master •Certificate Maker •Elite •Catalyst 2.0 and 3.0 •Murder On The Mississippi •Temple Of Apshai Trilogy •Troll Associates programs •Spell It •Regatta •Cdex Training programs •Think Fast *Features* •How to Write-Protect your Slot Zero •Capturing Locksmith 6.0 Fast Copy •Revisiting DOS to ProDOS and Back *Core* •Computer Eyes / 2: a Review *APTs* •Sword of Kadash & Rescue Raiders •Ultimaker IV

42 April 1987 *Softkeys:* •Light Simulator •Beach-Head •Monty Plays Scrabble •Racter •Winnie the Pooh •Infocom Stuff, Kabul Spy, Prisoner II •Wizardry 1 & 2 •Lucifer's Realm •The PFS Series •Dollars and Sense •Strip Poker •Coveted Mirror •Wizard's Crown •The Swordthrust Series •Axis Assassin •Manuscript Manager •The Crown of Arthain •Address Book •Decimals 3.0 •Dragonfire *Features* •Auto Duel Editor •Wizard's Crown Editor •Questron Mapper *Core:* •The Games of 1986 in Review *Adventure Tips* •Ultima IV

41 March 1987 *Softkeys:* •The Periodic Table •Gemstone Warrior •Inferno •Frogger •Story Maker •Adventure Writer •Mummy's Curse •Zaxxon •The Quest •Pitfall II •H.E.R.O. *Features* •A Two-Drive Patch for Winter Games •Customizing the Speed of a Duodisk •Roll the Presses Part Two: Printshop Printer Drivers •The Games of 1986

40 February 1987 *Softkeys:* •Adventure Writer •E-Z Learner •Mychess II •Raster Blaster •Cranston Manor •Ghostbusters •Designer's Pencil •The American Challenge •Encyclopedia Britannica Programs •Crime Wave *Features* •Taking the Wiz out of Wizardry •Adding a Printer Card Driver to Newsroom *Core:* Games of 1986

39 January 1987 *Softkeys:* •MIDI/8+ •Homeword v2.1 •Borrowed Time •Amazon •Speed Reader][•Discovery! •M-ss-ng L-nks series •Donald Ducks's Playground •Mastering the SAT •Copy][Plus 4.4C •Master of the Lamps •One on One •Bridge Baron •A.E. •Great American Cross-Country Road Race •Computer Preparation for the SAT •Castle Wolfenstein •Luscher Profile •Skyfox •Silent Service •Echo Plus •Swashbuckler •Randamn *Features* •Electronic Disk Drive Swapper •Abusing the Epilogues •Print Shop Companion's Driver Game *Core:* •Keyboard Repair •Fixing the Applesoft Sample Disk

38 December 1986 *Softkeys:* •Cyclod •Alternate Realty •Boulder Dash I & II •Hard Hat Mack (Revisited) •The Other Side •F-15 Strike Eagle •Championship Lode Runner •Gato V 1.3 •I, Damiano •Wilderness •Golf's Best *Features:* •The Enhanced/ Unenhanced //e •Looking into Flight Simulator's DOS *Core:* •Appavarex •Installing a RAM disk into DOS 3.3

37 November 1986 *Softkeys:* •Under Fire •Pegasus][•Take 1 (revisited) •Flight Simulator II v1.05 (part 2) •Magic Slate •Alter Ego •Rendezvous •Quicken •Story Tree •Assembly Language Tutor •Avalon Hill games •Dark Crystal *Features* •Playing Karateka on a //c •Track Finder •Sylk to Dif *Core:* •Breaking In: tips for beginners •Copy][Plus 6.0: a review •The DOS Alterer

36 October 1986 *Softkeys:* •Flight Simulator II v 1.05 •AutoDuel •Critical Reading •Troll's Tale •Robot War •General Manager •Plasmania •Telarium Software •Kidwriter v1.0 •Color Me *Features* •ScreenWriter meets Flashcard •The Bus Monitor •Mousepaint for non-Apples *Core:* •The Bard's Dressing Room *APT* •Championship Lode Runner

35 September 1986 *Softkeys:* •Olympic Decathlon •Hi-res Cribbage •Revisiting F-15 Strike Eagle •Masquerade •The Hobbit •Pooyan •The Perfect Score •Alice in Wonderland •The Money Manager •Good Thinking •Rescue Raiders *Feature:* Putting a New F8 on Your Language Card *Core:* •Exploring ProDOS by installing a CPS Clock Driver

34 August 1986 *Softkeys* •Crisis Mountain •Terripin Logo •Apple Logo II •Fishies 1.0 •SpellWorks •Gumball •Rescue at Rigel •Crazey Mazey •Conan •Perry Mason: The Case of the Mandarin Murder •Koronis Rift *Feature:* •More ROM Running *Core:* •Infocom Revealed

33 July 1986 *Softkeys* •Word Juggler •Tink! Tonk! •Sundog v2.0 •G.I. Joe & Lucas Film's Eidolon •Summer Games II •Thief •Instant Pascal •World's Greatest Football Game •Graphic Adventure #1 •Sensible Grammar & Extended Bookends •Chipwits •Hardball •King's Quest II •The World's Greatest Baseball Game *Feature:* •How to be the Sound Master *Core:* •The Mapping of Ultima IV

32 June 1986 *Softkeys* •Revisiting Music Construction Set •Cubit •Baudville Software •Hartley Software •Bridge •Early Games for Young Children •Tawala's Last Redoubt •Print Shop Companion •Kracking Vol II •Moebius •Mouse Budget, Mouse Word & Mouse Desk •Adventure Construction Set *Feature:* •Using Data Disks With Microzines *Core:* •Super IOB v1.5 a Reprint

31 May 1986 *Softkeys* •Trivia Fever •The Original Boston Computer Diet •Lifesaver •Synergistic Software •Blazing Paddles •Zardax •Time Zone •Tycoon •Earthly Delights •Jingle Disk •Crystal Caverns •Karate Champ *Feature:* •A Little Help With The Bard's Tale *Core:* •Black Box •Unrestricted Ampersand

30 April 1986 *Softkeys* •Millionaire •SSI's RDOS •Fantavision •Spy vs. Spy •Dragonworld •King's Quest •Mastering the SAT •Easy as ABC •Space Shuttle •The Factory •Visidex 1.1E •Sherlock Holmes •The Bards Tale •*Feature* •Increasing Your Disk Capacity •*Core:* •Ultimaker IV, an Ultima IV Character Editor

29 March 1986 *Softkeys* •Threshold •Checkers v2.1 •Microtype •Gen. & Organic Chemistry Series •Uptown Trivia •Murder by the Dozen •Windham's Classics •Batter Up •Evelyn Wood's Dynamic Reader •Jenny of the Prairie •Learn About Sounds in Reading •Winter Games •*Feature* •Customizing the Monitor by Adding 65C02 Disassembly •*Core:* •The Animator

28 February 1986 *Softkeys* •Ultima IV •Robot Odyssey •Rendezvous •Word Attack & Classmate •Three from Mindscape •Alphabetic Keyboarding •Hacker •Disk Director •Lode Runner •MIDI/4 •Algebra Series •Time is Money •Pitstop II •Apventure to Atlantis •*Feature* •Capturing the Hidden Archon Editor •*Core:* •Fingerprint Plus: A Review •Beneath Beyond Castle Wolfenstein (part 2)

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29	□	□	□
★28	□	□	□
27	□	□	□
26	□	□	□
25	□	□	□
24	□	□	□
■23	O	□	O
22	□	□	□
■21	O	□	O
20	□	□	□
★19	□	□	□
■18	O	□	O
■17	O	□	O
★16	□	□	□
■15	O	□	O
■14	O	□	O
■13	O	□	O
■12	O	□	O
■11	O	□	O
■10	O	□	O
■9	O	□	O
■8	O	□	O
■7	O	□	O
Core 3	□	□	□
■6	O	□	O
■5	O	●	●
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COMPUTIST

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Norm de Plume

Neal Jhala's softkeys for TEST DRIVE worked on the CGA version of the program dated 11-17-87 9:21p and as he suggested, I looked for a similar sequence of bytes to patch the EGA version of Test Drive.

I found this sequence 55 56 57 06 1E residing at $88ED, however, changing it to 31 C0 C3 06 1E did not deprotect the disk. Additionally, the series of bytes 55 56 57 was found at $87E6 followed by B8 64. This also was charged, to no effect. The EGA version of this file is dated 11-10-87 7:34a.

Inputs anyone?

Softkey for...

VISICALC

Use the following procedure to transfer the 80-column Visicalc program from the Visicalc disk and write a standard .COM file which may be loaded on a non-standard disk drive (Winchester, 8-, etc).

[1] Format a disk.

FORMAT B:/S

[2] Start the Debug system.

DEBUG

[3] Insert the Visicalc disk in drive A:

L 100 0 138 2 *load the VC80 load/decrypter*
M 0 3FF 7000 *duplicate it in higher memory*
R CS *inspect command segment register*

[4] DEBUG will respond with the contents of the CS register (eg. 04B5) and prompt with a colon (:). Type the old contents +700 (hex). (eg. 04B5 becomes 0BB5). Do the same with the 'DS' register. DEBUG response to R CS might be:

CS 04B5 *Save the value you get, we'll need it later.*
:0BB5 *Type in your CS value +700 hex here*
R DS
DS 04B5
:0BB5 *Type in your DS value +700 hex here*

[5] Take the low order byte of the CS you saved above and substitute it for LL in the next line. Substitute the high order byte for HH:

E 107 LL HH *eg. -E 107 B5 04*
E 24D BB A8 00 90 *hard-wire the decryption key*

[6] Now, we must run the loader/decrypter.

G = 1B8 26B *execute from 1B8 to 26B*

[7] The entire program will now be loaded and decrypted and a register dump should appear on the screen. Now restore CS and DS to their previous values and set the file length in CX. Set BX=0:

R CS
CS 0BB5 *Yours might be different*
:04B5 *Type in the value of CS you saved above*
R DS
DS 0BB5
:04B5 *Type in the value of DS you saved above*
R BX
BX F3FD
:0
R CX
CX 0000
:6B64 *Length = 6B64 For v1.1, 6802 for v1.0*

[8] Now we must name the file, write it and exit. Remove the Visicalc disk from A: and insert the new, formatted, empty disk in A:

N VC.COM *or whatever you wish to name it)*
W *write the .COM file*
Q *exit from DEBUG*

Back in DOS, type VC to try it.

A.S.P.

Softkey for...

Multilink v2.08 (2.08c, 3.00c)

[1] Format 1 system disk under DOS 2.0 or 2.1 (3.0 for v 3.00C of ML). Label it according to the original "Multilink" diskette.

[2] Copy the files from the original diskette to the corresponding formatted diskette. Place the original "Multilink" diskette back in the manual.

[3] Next, we'll use DEBUG to make some changes to MLINK.COM.

DEBUG MLINK.COM

Version 2.08

E 32BE 5A:20 5A:20 5A:20
E 3A11 E8:F8 FF:90 00:90
E 3A19 E8:F8 F7:90 00:90
E 3A39 75:90 E9:90
E 3A4B 7C:90 47:90
E 3AEA 74:90 0B:90
E 3AF4 FA:90 EB:90 FE:90

Version 2.08c

E 32F6 5A:20 5A:20 5A:20
E 3A49 E8:F8 FF:90 00:90
E 3A51 E8:F8 F7:90 00:90
E 3A71 75:90 E9:90
E 3A83 7C:90 47:90
E 3B22 74:90 0B:90
E 3B2C FA:90 EB:90 FE:90

Version 3.00c

E 33C0 5A:20 5A:20 5A:20
E 3B69 E8:F8 FF:90 00:90
E 3B71 E8:F8 F7:90 00:90
E 3B91 75:90 E9:90
E 3BA3 7C:90 47:90
E 3C42 74:90 0B:90
E 3C4C FA:90 EB:90 FE:90
W
Q

Softkey for...

Multilink v2.06

This softkey allows booting directly from hard disk without the need to insert the MultiLink distribution disk.

[1] Make a backup first.

COPY MLINK.COM MLINK.BAK

[2] Startup DEBUG.

DEBUG MLINK.COM
U 2DFA *Unassemble from address 2DFA.*

You should see:

```
xxxx:2DFA CALL 2F01
xxxx:2DFD JNB  2E10
xxxx:2DFF MOV  CX,2908
xxxx:2E02 CALL 2F01
xxxx:2E05 JNB  2E10
xxxx:2E07 DEC  BYTE PTR [2E0F]
xxxx:2E0B JG   2DF2
xxxx:2E0D JMP  07C4
xxxx:2E10 XOR  BYTE PTR [2E0D],32
xxxx:2E15 MOV  AX,[23C4]
xxxx:2E18 CMP  [2705],AX
```

If you don't see this, you have another version. If so, enter 'Q' to quit the debug session. Otherwise, continue. The instructions at XXXX:2DFA, XXXX:2E02, and XXXX:2E1C need to be replaced.

E 2DFA F8 90 90 *CLC, NOP, NOP*
E 2E02 F8 90 90 *CLC, NOP, NOP*
E 2E1C 90 90 *NOP, NOP*
W *Save the changes to disk*
Q *Exit debug.*

Softkey for...

Professional BASIC

Professional BASIC, by Morgan Computing, has a serial number embedded in

the code which the program checks in order to begin running a BASIC program. It will not execute a BASIC program if the serial number is *corrupted*.

Here is how to 'corrupt' the serial number and retain the full functions of PB.EXE. You will need a 'disk zap' program such as SecMod, Disk Explorer, or Media Magician.

The serial number is contained in the PB.EXE file in the 216th sector of the program, at hex offset DE. It is preceeded by the words 'Serial Number is' and is followed by a zero byte. Use your disk zapper to change the serial number to whatever you wish, and record the *EXACT* sequence of bytes you put there. *DO NOT* 'clobber' more than nine (9) bytes of serial number.

Now go to the next-to-last sector of PB.EXE. This is sector number 289, relative to the start of the program. At hex offset 25 in this sector is a nine-byte string which is an encoded version of the original serial number. This is the 'copy' which PB uses to detect 'corruption' of the plain text serial number. To enter a 'copy' corresponding to your new serial number, perform the following operations:

Using a piece of paper, write the 'new' serial number down, but *ROTATE IT* 5 characters to the *RIGHT*. For example, if your new serial number is 'YO HO HO ', the rotated string becomes 'O HO YO H'.

Now add one to the byte value of each of the rotated characters. You might have to refer to a table of ASCII codes to do this. In the example above, you'll get 'P!IP!ZP!I'.

This is the text string to use to replace the 'copy' string in sector 289, offset 25H.

Softkey for...

ThinkTank v1.000

[1] Diskcopy the original disk to another floppy or copy the files to a hard disk.

[2] Rename TANK.EXE.

```
RENAME TANK.EXE TANK.XXX
```

[3] Rename INSTALL.EXE.

```
RENAME INSTALL.EXE INSTALL.XXX
```

[4] Startup DEBUG and display all the registers.

```
DEBUG TANK.XXX
R
```

[5] Look for the value in the DS register (left-hand column of the second line of the R display). Add 2000 to that DS value. (ie. If the R display showed DS = 0D5F then you will use 2D5F. I will refer to this value later as xxxx.

[6] Check that your version is the same.

```
U A8E9
```

You should see JZ A8EE on the first line of the display. If so, this patch should work.

```
E xxxx:59 90 90
E xxxx:5C B8 00 00 90
E A8E9 EB 03
E A902 EB 03
```

[7] Save these changes.

```
W                    write
Q                    Quit Debug
```

[8] Rename TANK back to it's original name.

```
RENAME TANK.XXX TANK.EXE
```

[9] Restart DEBUG.

```
DEBUG INSTALL.XXX
```

[10] Check the version to make sure this will work.

```
U 2D01    You should see JZ 2D06 on the first line.
E 2D01 EB 03
E 2D1A EB 03
E 50D9 90 90
E 50DC B8 00 00 90
```

[11] Save the changes.

```
W
Q
```

[12] Rename INSTALL back to original name.

```
RENAME INSTALL.XXX INSTALL.EXE
```

That's it. The original floppy is no longer needed. You may copy the TANK files to a hard disk, network or other floppy with normal DOS commands.

Softkey for...

ThinkTank v1.001

[1] Diskcopy the original disk to another floppy or copy the files to a hard disk.

[2] Rename TANK.EXE.

```
RENAME TANK.EXE TANK.XXX
```

[3] Rename INSTALL.EXE.

```
RENAME INSTALL.EXE INSTALL.XXX
```

[4] Startup DEBUG and display the registers.

```
BEBUG TANK.XXX
R
```

[5] Look for the value in the DS register (left-hand column of the second line of the R display). Add 1000 to that DS value. (ie. If the R display showed DS = 0D5F then you will use 1D5F.) I will refer to this value later as xxxx. Add 2000 to the original DS value (ie. If DS = 0D5F, it is now 2D5F). I will refer to this later as yyyy.

[6] Check that your version is the same.

```
U xxxx:91F9
```

You should see JZ 91FE on the first line of the display. If so, this patch should work.

```
E yyyy:319 90 90
E yyyy:31C B8 00 00 90
E xxxx:91F9 EB 03
E xxxx:9212 EB 03
```

[7] Save these changes.

```
W
Q                    exit Debug
```

[8] Rename TANK back to it's original name.

```
RENAME TANK.XXX TANK.EXE
```

[9] Restart Debug.

```
DEBUG INSTALL.XXX
```

[10] Check the version to make sure this will work.

```
U 2D01    You should see JZ 2D06 on the first line.
E 2D01 EB 03
E 2D1A EB 03
E 50D9 90 90
E 50DC B8 00 00 90
```

[12] Save the changes.

```
W
Q
```

[13] Rename INSTALL back to original name.

```
RENAME INSTALL.XXX INSTALL.EXE
```

That's it. The original floppy is no longer needed. You may copy the TANK files to a hard disk, network or other floppy with normal DOS commands.

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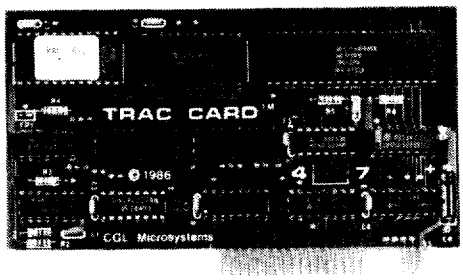

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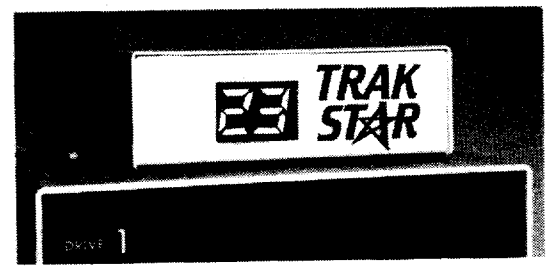

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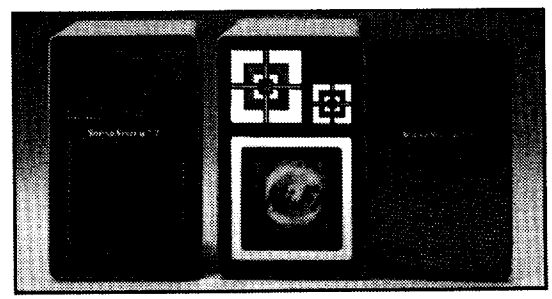

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