For The Serious User Of Personal Computers

COMPUTIST

Issue 52 February 1988

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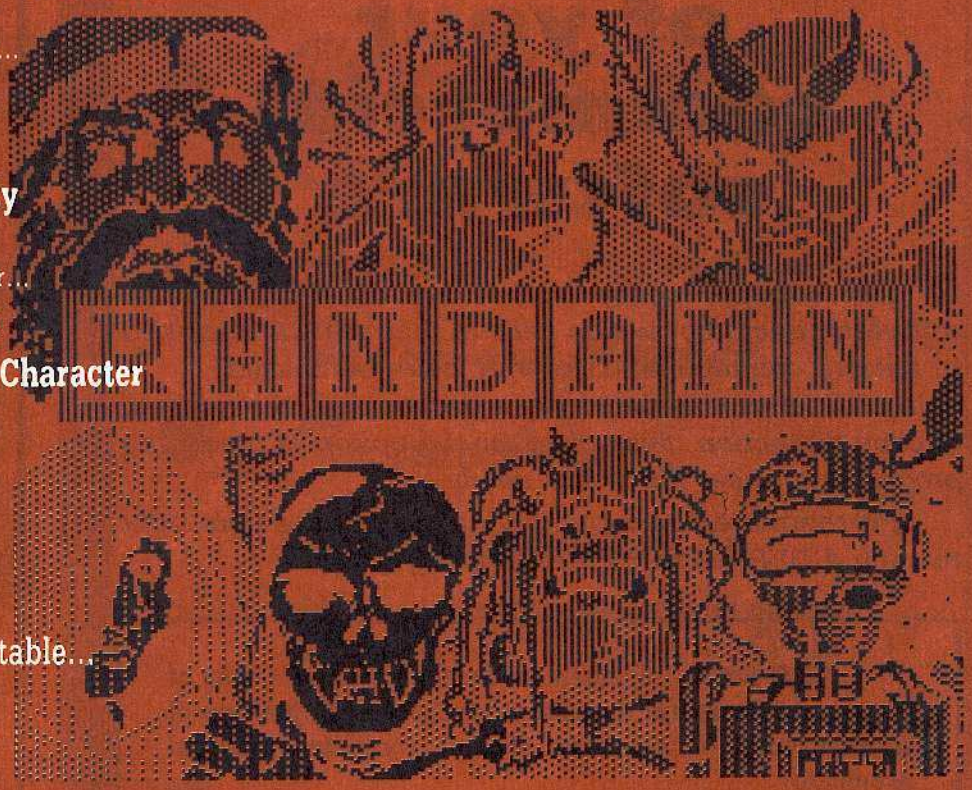
RDEX Features:

M.M.McFadden's Softkey for...
SSI's RDOS disks
- I. ProDOS RDOS
- II. RDOS Transfer Utility

Thomas V. Rapheld's APT for...
Alternate Reality: Dungeon
- Create A Super-human Character



Jeff Hurlburt's
- Product Monitor

John Doe's
Unprotecting The Unprotectable...
- MacIntosh Softkeys!

Christopher Dean's
- Making Cracked II Plus Disks Work On The IIc

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☌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 ..... ● *IIgs softkey.* ★ *MacIntosh softkey.*

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February 14

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Editorial.....

☐ Zip Chip — Fact or Fiction?

I received a number of calls lately, asking about the **ZIP CHIP**.

Advertised as a plug-in replacement for the 65C02 processor, it is supposed to speed-up programs without any other changes. Sort of like having a Transwarp card without using a slot.

The people calling us have ordered the chip but not received anything except color brochures. One of the callers was worried that the ZIP CHIP was "vapor-ware".

I called the customer service number at ZIP Technology (1-800-628-3278) and was informed that **no** ZIP CHIPs have been shipped as of this date (Jan 29.). The lady was unable to tell me why as all of the technical people had left for the day or were busy elsewhere. I left my number so maybe they'll call back.

I will give you some free advice but remember the saying about free advice being worth just what you paid for it.

Anyway, I have been advised that there is a **federal law that requires a mail-order business to ship a product within 30 days after processing an order. After 30 days your money must be refunded and/or you must be notified of the delay and given the option of a refund or allowing the item(s) to be back-ordered.**

I suppose processing an order could be construed as when your card was debited or your check cashed. (You didn't send cash, did you?) So it's up to you whether you want to wait and see or demand a refund and reorder when they actually have a product ready to ship.

☐ This must be my month for complaints.

There is one recurring theme that you (the COMPUTIST reader) can answer better than I. How about taking a look and seeing if maybe you can help.

"Why are so many of your softkeys so brief, without any sort of explanation as to why something was done. I'm new to COMPUTIST and no expert. Why don't you write some articles for me, the beginner, so I can understand what's going on, too."

I can understand your frustation but there is little that I can do. RDEX is just what the title says: an exchange of data between readers. Short or long, I can only print what I receive. Let's hope someone out there is moved to write a long, in-depth softkey.

BUGS

COMPUTIST #47, page 32. Step six is incorrectly shown as *60. That part should read:

5 Re-enter the monitor.

```
CALL -151
```

6

```
2900<B800.BFFFM
```

COMPUTIST #48, page 12. There is a bug in the Ultima Encounter Editor program. Line #1190 should read:

```
1190 For I = 1 TO LEN (IN$)
```

This allows the user to edit the maps correctly.

COMPUTIST #48, page 36. The publisher of J-Bird is incorrectly shown as Cosmy Corp. The correct publisher is Orion Software.

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And lots of assorted short notes, questions and answers, complaints and compliments.

Readers Data

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

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

What is a softkey, anyway?

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

Commands and control keys

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

6 CTRL-P

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

Special requirements

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

Software recommendations

☞ Applesoft program editor such as *Global Program Line Editor (GPLE)*.

☞ Sector-editor such as *DiskEdit* (in the *COMPUTIST Starter Kit*) or *ZAP* from *Bag of Tricks*.

☞ Disk-search utility such as *The Inspector*, the *CIA* or the *Core Disk Searcher* (in the *COMPUTIST Starter Kit*).

☞ Assembler such as the *S-C Assembler* from S-C software or *Merlin/Big Mac*.

☞ Bit-copy program such as *Copy II Plus*, *Locksmith* or *Essential Data Duplicator* (EDD).

☞ Text-editor (that produces normal sequential text files) such as *Applewriter II*, *Magic Window II* or *Screenwriter II*.

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

Super IOB and Controllers

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

Reset into the Monitor

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

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

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

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

Recommended literature:

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

Keying in Applesoft programs:

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

```
10HOME:REMCLEAR SCREEN
```

The LIST will look like:

```
10 HOME : REM CLEAR SCREEN
```

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

Keying In Hexdumps

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

```
CALL -151
```

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

When finished, return to BASIC with:

```
3D0G
```

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

Keying in source code

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

Computing checksums

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

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

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

EXchange

who want all their software backed up and COPYA-able

CHECKSOFT instructions:

LOAD *filename*
BRUN CHECKSOFT

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

CHECKBIN instructions:

CALL -151
BLOAD *filename*

Install *CHECKBIN* at an out of the way place

BRUN CHECKBIN, A$6000

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

SSS.EEE [Y]

Correct the lines at which the checksums differ.

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

—appleRDEXed

Mia culpa...I goofed

In the previous issue COMPUTIST #51, I inadvertently omitted a name and thereby incorrectly attributed a fine softkey. Because of this, I am reprinting the letter now under the correct byline. Please accept my apologies, Mr. Wilson. . . . . *Apple-RDEXed*

Bill Wilson

SIOB Softkey for...

Master Diagnostics IIe

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

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

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

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

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

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

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

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

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

Insert your DOS 3.3 disk and type **C600G**. After it has booted, reinsert your disk with SIOB on it and type **BSAVE RWTS.MD, A$1900, L$7FF**.

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

Controller

```
1000 REM SWAP CONTROLLER FOR MDIIE
1010 TK = 3 : LT = 35 : ST = 15 : LS = 15 : CD = WR
     : FAST = 1
1020 GOSUB 360: GOSUB 490: GOSUB 610
1030 GOSUB 360: GOSUB 490: GOSUB 610: IF PEEK
     (TRK) = LT THEN 1050
1040 TK = PEEK (TRK) : ST = PEEK (SCT) : GOTO 1020
1050 HOME : PRINT "COPYDONE" : END
10010 PRINT CHR$ (4) "BLOAD^RWTS.MD, A$1900"
```

Controller Checksums

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

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

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

examine the files, it will perform all DOS commands normally.

1 Boot DOS 3.3 and clear any Applesoft program.

NEW

2 Make the greeting program binary.

POKE 40514,52

3 Insert blank disk and initialize.

INIT STARTUP

4 Delete the hello program.

DELETE STARTUP

5 Boot the MDIIe disk.

6 Enter the monitor and move the RWTS.

CALL -151
1900<B800.BFFFM

7 Boot your SIOB disk.

8 Save the MDIIe RWTS and load SIOB.

BSAVE RWTS.MD,A$1900,L$7FF

LOAD SUPER IOB V1.5

9 Type the controller and...

RUN

Brian A. Troha

**IIgs Softkey for...*

Shanghai
Activision

After receiving a replacement *Shanghai* disk (mine would crash when loading one of the dragon picture files), I found that Activision has changed and moved the protection routines, now $5D0F (formerly $5D09) must hold a value of $0001. Again I changed three bytes to store the correct value at $5D0F and overwrote the call to the disk-check routine.

Then I searched the disk for any reference to $5D0F, found the second half of the protection and changed that too.

The edits set the flag to pass then ignore the flag altogether. This is overkill (as you actually crack *Shanghai* twice) but I wanted to overwrite the disk-read and continue the program no matter what. The edits are shown below with the changes to the disassemably so you can see what's going on:

From:		To:	
A0 00 00	LDY #$0000	A0 01 00	LDY #$0001
22 7A 78 00	JSL $00787A	AF 7A 78 00	LDA $00787A
8D 0F 5D	STA $5D0F	8C 0F 5D	STY $5D0F
:::::			
AD 0F 5D	LDA $5D0F	AD 0F 5D	LDA $5D0F
C9 01 00	CMP #$0001	C9 01 00	CMP #$0001
F0 0D	BEQ +0D	80 0D	BRA +0D

The actual edits are:

Block	Byte(s)	From	To
$243	$52	00	01
	$54	22	AF
	$58	8D	8C
$267	$148	F0	80

Softkey for...

Might and Magic
Activision

After getting *Might and Magic*, I looked through old COMPUTISTs and found two softkeys. While both will produce a working copy, the disk-check routine is still run.

Using the information provided in both softkeys, I found the disk-protection routine is at $8E00—$8FFF.

I searched the disk and found a JSR $8E00. I simply changed this to two NOP's and one CLC. I'm not sure if the CLC is required but on the original the carry is cleared on return of the check.

Do the following to remove the disk-check from *Might and Magic*.

1 Copy the disk.

2 Make these sector-edits on disk A.

Trk	Sct	Byte(s)	From	To
$00	$0A	$AB-AD	20 00 8E	EA EA 18

Now *Might and Magic* boots up without checking for the original disk, and is no longer protected.

Jeff Hurlburt

THE PRODUCT MONITOR

Ratings

★★★★	EXCELLENT
★★★	VERY GOOD
★★	GOOD
★	FAIR
✋	POOR
✋✋	BAD
✋✋✋	DEFECTIVE

Evidently satisfied that we are, after all, true believers, the Apple gods have decreed that IIgs workings be removed from the list of things 'man was not meant to know'.

This month's focus is on the official Apple IIgs manuals developed by Apple Programmers Workshop and published by Addison-Wesley.

The Apple IIgs Manuals

APW, the Apple Programmers Workshop, is a coven of Apple wizards headquartered in Renton, Washington. For some time this group has been cooperating with Apple and releasing bits and pieces of IIgs lore in looseleaf beta-style packets. These, in somewhat beefed-up form, are destined to constitute a library of some thirteen or more volumes covering machine hardware, firmware, ProDOS 16, the toolbox, assembly coding, languages, and other topics.

These new manuals are very classy productions, exhibiting a strong concern for both accessibility and appearance.

Each begins with an exhaustive table of contents, finishes with several information-packed appendices, and includes a glossary as well as an index.

Throughout the texts, charts, tables, and assorted graphic aids, some very clever, are employed to good advantage; while boldface headings, red highlighting, and ample 'white space' facilitate quick reference.

At present, the hardware, firmware, and other weightier manuals are obtainable only in 7.5 x 9-inch (page size) hardcover format.

Though costlier than spiral-bound or softcover, the books are more rugged, won't flop over when shelved, and don't require weights or clamps to remain open to the page selected. Prices range from around $25 to $30 each.

Technical Introduction to the Apple IIgs
by A.P.W.
157 pages, softcover: $9.95

✋

In a "suite" (to borrow Apple's term) of ten or more references, there is certain to be at least some fluff. Fortunately, most of the fat in this series seems to be concentrated in one place: the "Technical Introduction".

Supposedly "an overview of machine features from a programmer's perspective", this is yet another getting-ready-to-get-ready primer. Too general to be of any practical benefit to programmers, the text, even so,

manages to be specific in a few places-- such as noting that double-hi-res provides unrestricted 560 x 192 resolution in sixteen colors!? (Try 140 x 192.)

Not bad as far as book-length IIgs commercials go, "Technical Introduction" does supply a fair overview; but so do Apple brochures or any of several machine reviews.

Unless you are still shopping, this one amounts to 3/8-inch of dead shelf space.

Apple IIgs Hardware Reference
by A. P. W.
309 pages, hardcover: $24.95

Apple II people have long been held in something approaching awe by users of other personal computers. These innocents cringe at the notion of directly accessing registers, let alone popping the lid and (gasp!) actually stirring about in the machine's innards.

Now, with release of the official "Hardware Reference", Apple nerds have the basic information required to launch a new era of homebrew enhancements and experimentation.

"Basic information", it turns out, is comprehensive documentation of every major IIgs sub-system, including the microprocessor, Fast Processor Interface (FPI), Mega II, memory, video, sound, the Desktop Bus, serial I/O, disk ports, real-time clock, slots, and power supply.

In each of ten chapters you will find relevant timing diagrams, register and soft-switch definitions, memory charts, and socket pin-outs. Besides the obligatory ASCII table, appendices include a very handy compendium of soft switches, registers, and key addresses-- among other goodies-- followed by eight double-size fold-out pages of IIgs schematics!

So, is this all you will ever need to know about your new Apple's hardware? Certainly, sound system documentation is detailed enough for experimentation with advanced IIgs audio; and the same is true for super-res video, memory expansion, and similar pursuits.

On the other hand, proprietary ICs (like FPI and Mega II) emerge as 'black boxes'-- adequately documented for most purposes, but lacking the sort of exposition accorded the microprocessor.

No hardware manual covers everything, not even the original, nearly legendary "Apple II Reference". This APW/Addison-Wesley effort does, however, seem to come very close.

A first rate production, the "Apple IIgs Hardware Reference" is possibly the best computer text of its kind.

Updates, Etc.

Apple recently confirmed discontinuation of IIe production, thus all but concluding the Dr. Who-like 'regeneration' process. The saga of the "endless II" continues.

Vendor & Resource Information

Addison-Wesley Publishing
Route 128
Reading, MA 01867
(617-944-3700)

Apple Programmers Workshop
290 SW 43rd Street
Renton, WA, 98055
(206-251-6548)

Zorro

Playing Tips for...

Beyond Castle Wolfenstein
Muse Software

Unlocking Doors

To use the tool kit, press [T] repeatedly until the message

OPENING DOOR...

appears in the text window below the playing screen.

If you have no tool kit, and you are fearful of wasting your precious bullets, follow these steps:

[1] Point the gun towards the door you wish to open and while standing next to the door, start typing the numbers (0-9) until a small **beep** is heard from one of the keys.

[2] Then, go through the numbers again until yet another beep is heard.

[3] Then, do it *once more* which makes it 3 times. Pay close attention to the Apple's speaker, for the sound is not very loud.

For some reason, all the locked doors have this special 3-digit combination of numbers. Don't assume that all the combos are the same, however, because random codes are generated door-to-door, and game-to-game.

Stab the guard in the back

One more thing. Never stab a guard while he is facing you. You may get off lucky if you try it, but chances are you'll get shot. I had to learn this the hard way. But now, YOU don't have to.

Donald Jones

A.P.T. for...

Arctic Fox
Electronic Arts

■ **Requirements**

☐ Sector-editor
☐ Broken copy of *Arctic Fox*

99 mines and missiles

If you are tired of running out of ammo while playing *Arctic Fox*, then have I got somthing for you. After my tenth game I was fed up reaching my objective to find out I didn't have any missiles left, which you need to destroy the main fort. So I took out *Copy II Plus* and proceded to uncover the location for the mines and missiles.

I first searched for the hex value of the current amounts of mines and missles you are given. After only succeeding in making Alien heavy tanks fly and wasting an afternoon, I decided to look for just the numbers (25 15). The first is mines and the second is missiles. I found it on track $1D. I then changed them to 99s and booted it up. I couldn't believe it, I had 99 mines and missiles.

The following are the values to change for all the different levels of play.

Trk	Sct	Byte(s)	From	To
$1D	$09	$BF-C0	75 50	99 99
		$D1-D2	25 15	99 99
		$E3-E4	15 10	99 99

That's it.

Look at yourself?

Also, if you're wondering what you look like in the game, just fire a missile and loop it in a circle. You are the tank with the two antenna's.

WARNING: you can destroy yourself with your own missiles! But it takes at least three missiles.

A.P.T. for...

Bard's Tale II
Electronic Arts

■ **Requirements**

☐ *Bard's Tale*
☐ *Bard's Tale II*
☐ Sector-editor

Changing Characters

I first tried to go in and change my character on the *Bard's Tale II* disk with my sector editor. However, the game has a nibble-count for each character and wouldn't load it after I changed it.

So I used Ben Youngdahl's article in COMPUTIST #31 and changed my *Bard's Tale*'s character. Then I booted *Bard's Tale II* and updated my just-altered *Bard's Tale* character.

Bard's Tale II accepted the changed characters without a fuss.

1 Boot *Bard's Tale I*. Then make some characters and save with a party name.

2 Boot your sector editor and change your characters equipment, money, and experience using COMPUTIST #31. Don't change the character stats!

3 Boot *Bard's Tale I* again and add party by using the saved party's name. Then go to the review board. With the experience you added in step 2 have your character reviewed. Keep reviewing him until you run out of experience points or until you have reached the level you wanted.

NOTE: If you have a magic user and you change classes, then you will lose all of your current experience points.

4 Save your new characters back to disk. Then boot *Bard's Tale II*. When prompted to update *Bard Tale* Characters, type "yes". Transfer all your characters over. You now have *Bard Tale II* characters.

(?) I recently received *Under Fire* as a gift and I would like to back it up. I tried using the method by John Howard in COMPUTIST #37. But I couldn't do it on my IIc. Does anybody else know of a different way I could use?

Jason Cobb

An enhancement for...

Color Ultimapper

When I tried the original *Ultimapper* in COMPUTIST #33 I thought it was great, then it added color. But I have an Imagewriter II and I can't change ribbons that easily.

I made a few modifications to the original color program, so it would do it for me. Load the original *Color Ultimapper*, type the modifications and:

SAVE COLOR ULTIMAPPER IV:IMAGE

Here are the modifications to *Color Ultimapper* and the checksums for the entire program:

Mods for *COLOR ULTIMAPPER IV*

```
300 CO = CO + 1: PRINT "POSITION PAPER. AND
    PRESS RETURN FOR NEXT COLOR. ": : INPUT
    "": A$
301 PR# 1
302 IF CO$(CO) = "BLUE" THEN GOSUB 800
303 IF CO$(CO) = "GREEN" THEN GOSUB 810
304 IF CO$(CO) = "RED" THEN GOSUB 820
305 IF CO$(CO) = "YELLOW" THEN GOSUB 830
306 IF CO$(CO) = "BLACK" THEN GOSUB 840
799 END
800 PRINT CHR$ (27) + CHR$ (75) + CHR$ (51):
    RETURN
810 PRINT CHR$ (27) + CHR$ (75) + CHR$ (53):
    RETURN
820 PRINT CHR$ (27) + CHR$ (75) + CHR$ (50):
    RETURN
830 PRINT CHR$ (27) + CHR$ (75) + CHR$ (49):
    RETURN
840 PRINT CHR$ (27) + CHR$ (75) + CHR$ (48):
    RETURN
```

Checksums

```
10   - $BADD      330  - $258F
20   - $9B13      340  - $7BF5
30   - $4D3B      350  - $3136
35   - $8081      360  - $CE43
40   - $971F      370  - $4B63
50   - $A151      380  - $B802
60   - $5F38      390  - $F0B2
70   - $8A25      400  - $32B9
80   - $13B9      410  - $B952
90   - $1F6D      420  - $D4AE
100  - $36BB      430  - $2EC4
110  - $9A92      440  - $D57D
120  - $1CC1      450  - $E5B5
130  - $8B6F      460  - $4E6F
140  - $C0FD      470  - $1C3F
150  - $E384      480  - $B8BA
160  - $BEAE      490  - $CD82
170  - $FCC2      500  - $0197
180  - $4863      510  - $9AD0
190  - $E554      520  - $82C3
200  - $CC25      530  - $4A84
210  - $0B40      540  - $3BA1
220  - $F5BC      550  - $831A
230  - $F844      560  - $1D18
240  - $5CC4      570  - $CFEB
250  - $750F      580  - $9854
260  - $8AD3      585  - $563D
270  - $0082      590  - $F614
280  - $C77E      600  - $2341
290  - $A93D      610  - $DA43
300  - $064B      620  - $66F7
301  - $6572      630  - $F40B
302  - $7FC1      640  - $C17B
303  - $CA90      799  - $6541
304  - $F22C      800  - $3208
305  - $9757      810  - $6719
306  - $C509      820  - $02A5
310  - $6D6C      830  - $D3C4
320  - $0479      840  - $F3A0
```

SIOB Softkey for...

Ultima I

Origin Systems Inc

When I first got this game, I thought that it would be well-protected, since it was made recently, was a great seller, and probably the best game of it's time.

Careful inspection of the disk allowed me to find out that the even tracks (0,2,4 etc.) were not protected at all, but the odd ones had a simple change of D4 AA 96 in the address.

I made a controller for it by modifying a standard one, but it didn't work. A more careful inspection revealed that the epilogue bytes also change. A simple **$B942:18** fixed that.

To copy it, load *Super IOB* and install this lengthy controller into it. Before running the controller be sure to go into the monitor and type **B942:18**. It will copy the even tracks first, then it will go back and copy the odd ones. No further changes are needed because it doesn't seem to check to see if the addresses D4 AA 96 are there or not.

After copying this, I put it on a 3½" disk and it worked fine. I assume it would also work on a hard disk. Also, the catalog will worked fine.

CALL -151
B942:18

Controller

```
1000 REM ULTIMA I ( ALSO RING QUEST, RINGS OF
     ZILFIN) CONTROLLER
1010 TK = 0:ST = 0:LT = 35:CD = WR
1020 T1 = TK: GOSUB 490
1025 IF TK = 35 THEN GOTO 1100
1030 GOSUB 430: GOSUB 100:ST = ST + 1 IF ST < DOS
     THEN 1030
1040 IF BF THEN 1060
1050 ST = 0:TK = TK + 2: IF TK < LT THEN 1030
1060 GOSUB 490:TK = T1:ST = 0: GOSUB 230
1070 GOSUB 430: GOSUB 100:ST = ST + 1: IF ST < DOS
     THEN 1070
1080 ST = 0:TK = TK + 2: IF BF = 0 AND TK < LT THEN
     1070
1090 IF TK > 35 THEN GOTO 1095
1091 IF TK = 15 THEN GOTO 1096
1092 IF TK = 29 THEN GOTO 1097
1093 GOTO 1020
1095 TK = 1:ST = 0:LT = 35:CD = WR: RESTORE : GOSUB
     190: GOTO 1020
1096 TK = 15:ST = 0:LT = 35:CD = WR: RESTORE :
     GOSUB 190: GOTO 1020
1097 TK = 29:ST = 0:LT = 35:CD = WR: RESTORE :
     GOSUB 190: GOTO 1020
1100 HOME : PRINT "DONE WITH COPY" : END
5000 DATA 212,170,150
```

Controller Checksums

1000	- $356B	1090	- $A88E
1010	- $3266	1091	- $AAF4
1020	- $C11A	1092	- $8D56
1025	- $8E28	1093	- $A75B
1030	- $A311	1095	- $D52D
1040	- $670A	1096	- $6A3B
1050	- $68EE	1097	- $CE37
1060	- $2488	1100	- $E04A
1070	- $2C8D	5000	- $1FB1
1080	- $2335		

SIOB Softkey for...

Ring Quest
SSI

SIOB Softkey for...

Rings of Zilfin
SSI

This controller will also work with OSI's *Ring Quest* and also SSI's *Rings of Zilfin* with **no further modifications**.

Clay Ruth

Addendum to curing IIgs woes for Graphic Grabber

Ralph Jones had the right idea (COMPUTIST #49) regarding his cure for *Graphic Grabber*'s IIgs woes, but he sure went about it the hard way! I trimmed his machine code down to 39 bytes (as opposed to his 140) and attached it to *OBJ.GRAPHIC GRABBER*, as was his original intention. The object file originally resides in locations $4000—$41AA, so our new code begins at $41AB as follows:

```
                1000          .OR $41AB
                1010          .TF GRAB.O
                1020
41AB- A2 4F     1030 MOVE.UP  LDX #$4F
41AD- A0 55     1040          LDY #$55
41AF- D0 04     1050          BNE MOVE
                1060
41B1- A2 55     1070 MOVE.DN  LDX #$55
41B3- A0 4F     1080          LDY #$4F
                1090
41B5- 8E C1 41  1100 MOVE     STX SRC+2
41B8- 8C C4 41  1110          STY DST+2
41BB- A2 06     1120          LDX #6
41BD- A0 00     1130          LDY #0
41BF- B9 00 55  1140 SRC      LDA $5500,Y
41C2- 99 00 4F  1150 DST      STA $4F00,Y
41C5- C8        1160          INY
41C6- D0 F7     1170          BNE SRC
41C8- EE C1 41  1180          INC SRC+2
41CB- EE C4 41  1190          INC DST+2
41CE- CA        1200          DEX
41CF- D0 EE     1210          BNE SRC
41D1- 60        1220          RTS
```

This changes the CALL addresses in Mr. Jones' line 380, and eliminates the need for his line 100.

To properly fix *GRAPHIC GRABBER 3.0*, proceed as follows:

1 Load the original object code.

```
BLOAD OBJ.GRAPHIC GRABBER
```

2 Enter the monitor and add the new code.

```
CALL -151
41AB: A2 4F A0 55 D0
41B0: 04 A2 55 A0 4F 8E C1 41
41B8: 8C C4 41 A2 06 A0 00 B9
41C0: 00 55 99 00 4F C8 D0 F7
41C8: EE C1 41 EE C4 41 CA D0
41D0: EE 60
```

3 Save the new object file.

```
BSAVE OBJ.GRAPHIC^GRABBER, A$4000,
    L$1D2
```

4 Load the BASIC part of the program.

```
LOAD GRAPHIC^GRABBER^3.0
```

5 Delete the "Lam" routine and change line 380 to call our new code.

```
DEL 290,300
380 CALL 16817 : CALL 16499 : CALL 16811 :
    RETURN
```

6 Save the program with a new version number so you won't confuse it with the old one.

```
SAVE GRAPHIC^GRABBER^3.1
```

That's it!

I deliberately avoided using any 65C02 or 65816-only instructions or any tricky ROM calls, so this version will work just fine on everything from an Apple II Plus with a 6502, all the way up to the IIgs.

A. Evans

A.P.T. for...

Beyond Zork
Infocom

■ **Requirements**

☐ Sector-editor
☐ *Beyond Zork* save-disk

Strengthening Zork Players

This APT allows you to fortify any of the 7 attributes of a character that has been previously created and saved from *Beyond Zork*.

I suggest that you modify a character **before** you begin your adventure because the game monitors experience points to check the validity of your character's attributes.

Modifying a character saved in mid-quest results in a visit from the 'technical nymph' who ends the game promptly.

There are 3 disk locations associated with each saved game:

Game	Track	Sector
1	$07	$06
2	$13	$07
3	$1E	$06

All three locations contain the character attributes:

Attributes	Status	Limits
endurance	$73	$83
strength	$75	$85
dexterity	$77	$87
intelligence	$79	$89
compassion	$7B	$8B
luck	$7D	$8D
armor class	$7F	$8F
experience	should be 0	$81

Values at these location should be no greater than $63 (99).

Limits increase as experience is gained, so be sure to make your **current** values no greater than the attribute **limits**.

This modification should provide you with characters that will withstand and overcome many of the game's obstacles and monsters.

Playing Tips for...

Zork
Infocom

- If you have trouble naming weapons or creatures, you need to visit the implementors first.
- Give the Monkey Grinder a deadly 'treasure' to obtain the 'outline' of something useful in another dimension.
- The Scroll of Recall can get you out of tough situations.
- Have you tried the Pterodactl Taxi Service? (Don't forget the saddle).
- Use the Hurdy-Gurdy to add color to the third scarecrow (this is a necessary detail in deciding which key to choose in the Land of Froon).

John Doe

Unprotecting The Unprotectable

Softkey for...

Macintosh software

■ **Requirements**

- ☐ Apple Macintosh Computer 128K
- ☐ Apple Macintosh System Disk
- ☐ Blank disk
- ☐ Apple's *A Guided Tour of Macintosh* or Apple's *MacTest 1.Ø (Apple's Dealer Diagnostic Disk)*

This softkey will work with just about **all** Macintosh software that gives you a:

That Application May Not Be Duplicated Or Moved ...error whenever you attempt to copy it or files that are **invisible** so that you can't find it to transfer it.

This method also will get around some of the newer techniques in which the software manufacturers only format part of the disk (***Remember when that was one of the first methods for stopping Apple's COPYA*** program years ago before there were nibble-copiers?).

Penguin's...

Transylvania

I chose Penguin's *Transylvania* because it is normal of the type of protection being used today. It has files that are "protected" as well as some that are "invisible" or possibly areas of the disk that are unformatted or nonstandard.

However, I have found that this method works on the following:

MegaFiler

MegaMerge

Main Street Filer

Infocom's...

Zork I

Planetfall

(I believe that it will work on all Infocom's Mac software.)

Britannica's...

Millionaire

...and, I am sure, any other programs like these.

The Softkey

The following method will not only give you a working copy, but it will also give you a version that is no longer protected and that allows you to make as many backup copies as you see fit.

First, insert your system disk and, once you arrive at the desktop, eject the disk and insert your blank disk. Initialize the disk and call it ***XX*** (you may choose any name that you like, but XX is easier to remember).

Now you need to eject your new XX disk and turn the Macintosh off. What we need to do now is boot up either the *Mac Guided Tour Disk* or the *Dealer Diagnostic Disk* called *MacTest 1.Ø*.

Finding old Finders

The reason for this is that both of these disks have old versions of the *Finder*, both of which completely ignore copy-protection errors that normally stop you cold.

I would prefer that you use the *MacTest* disk because the *Guided Tour* (GT) disk has a *Finder* that tends to be too old and it has a tendancy toward blowing up during disk swapping (usually taking with it anything that is in the drive at the time).

The *Finder* on the *MacTest* disk is dated as the *Thanksgiving Day Finder* so I would imagine that any version around there would work. In either case, the process is the same.

Now that you have a formatted XX disk, and the Mac is turned off, insert your *MacTest* disk or your GT disk and boot it up. Both disks boot up to menus.

On the *MacTest*, simply pull down the options screen and select 'Quit to Finder.' On the GT disk, click on 'Let Me Use My MacIntosh!'.

Once at the *Finder* (also referred to here as the *Desktop*), you should see an icon of the *MacTest* disk. The test disks that I have seen are called *Mac64A*. The GT disk is simply called *Guided Tour*.

From here on in, the steps are the same, but it is also where three out of four times, the GT disk will go away (it's actually pretty exciting when the GT goes away...) so use it only if you have to, okay?

Alright, now eject the *MacTest* or GT disk and insert your *Transylvania* disk. If all goes right, it should read a little, and then ask you to swap with the *Mac64A (MacTest)* disk a couple of times. When it finally quits, you should have two icons on the desktop, *Mac64A* and the *Transylvania* disk.

Write-protect *Transylvania*

Eject whatever disk is in the drive (usually the *Transylvania* disk) and make sure that your *Transylvania* disk is write-protected (**very importan**: if you don't write-protect the *Transylvania* disk, during the copying the *Finder* will often update the directory so that it says that you now have no files and no storage memory being used).

Insert the XX disk. After a few moments and a few disk swaps, the XX disk will appear on the desktop. Now you need to select all of the files in the *Transylvania* disk and drag them onto the XX disk. The drive will spin for a few seconds and it will ask you to insert the *Transylvania* disk.

Swapping macDisks

Now the fun begins...Disk Swapping...It will take anywhere from 15 to 25 disk swaps depending on whether or not you selected all of the files to transfer.

Often during the swaps, you will receive an ERROR Signaled From I/O or Resource Manager>>>>>>>>>RESULT=-44 (or -48). Don't worry about it. It is only the *Finder*'s way of telling you that the files that you are copying are either copy-protected or that the disk that it is reading from is write-protected (It **IS** write-protected, right?) and that the *Finder* figures that you know what you are doing.

Just click the "OK" box or press the **enter** key to continue. Also, don't worry if you receive a lot of them, during one program I had well over 25 of them pop up.

Eventually, you will be asked to insert the *Mac64A (Mactest)* disk and you will have control again. Just eject whatever disk is in the drive, and turn off the MacIntosh. Insert the XX disk and turn the Mac on. It's done.

For some reason, I found that sometimes some of the system files don't transfer correctly, and the program bombs when it attempts to boot. If this occurs to you, just boot up the original, and transfer only the system files like you would normally. This is because I have yet to come across copy-protected system files -- only application files or invisible files.

Willem Moolenaar

Softkey for...

World Games
Epyx

1 Tell DOS to ignore endmarks and checksums then use *COPYA* to copy the disk.

POKE 47426,24
RUN COPYA

2 Sector-edit boot side.

Trk	Sct	Byte(s)	From	To
$00	$0E	$6F	D0 F4	EA EA
		7A	D0 1F	EA EA

Softkey for...

Ikari Warriors
Data East

1 Tell DOS to ignore endmarks and checksums then use *COPYA* to copy the disk.

POKE 47426,24
RUN COPYA

2 Sector-edit:

Trk	Sct	Byte(s)	From	To
$00	$06	$4B	$D0 F4	$EA EA
		$54	$D0 36	$EA EA
		$5D	$D0 2D	$EA EA
		$70	$D0 F4	$EA EA
		$7B	$D0 0F	$EA EA

A. P. T. Cornucopia

A.P.T. for...

Ikari Warriors
Data East

Unlimited Men, Grenades & Bullets

For unlimited men, grenades and bullets respectively:

Trk	Sct	Byte(s)	From	To
$19	$0E	$6E	E9 01	EA EA
		$93	E9 01	EA EA
		$BD	E9 01	EA EA

A.P.T. for...

Drol
Broderbund

For unlimited men:

Trk	Sct	Byte(s)	From	To
$0B	$0A	$20	E9 01	EA EA
$11	$0A	$0E	E9 01	EA EA
$17	$09	$B0	E9 01	EA EA

A.P.T. for...

Goonies
Datasoft

For unlimited lives:

Trk	Sct	Byte(s)	From	To
$12	$06	$F1	CE 52 10	EA EA EA

A.P.T. for...

Zorro
Datasoft

For unlimited lives:

Trk	Sct	Byte(s)	From	To
$0C	$06	$99	C6 BB	EA EA

A.P.T. for...

Cavern Creatures
Datamost

Unlimited Ships:

1 **Call -151**

2 Do not type spaces in the filenames!

BLOAD GAME1(ML)$7FD
4F42:EA EA
BSAVE GAME1(ML)$7FD, A$7FD, L$62FF

3

BLOAD SCROLL(ML)
1238:EA EA
BSAVE SCROLL(ML), A$7FD, L$7803

4

BLOAD AP
0B13:EA EA
BSAVE AP, A$8000, L$6800

One may also want to use one of the popular disk-editors such as *Copy II Plus* or *CIA* Files and scan for A5 17 38 E9 01 and change the E9 01 to EA EA.

Kenneth Foerster

Printing Starter Kit Documentation

I found the following to be an easy way to print the Starter Kit documentation:

1 Turn on your printer.

2 Boot *COPY II Plus* in drive 1.

3 From the main menu select: SET PRINTER SLOT and enter your printer's slot number.

4 Select: VIEW FILES.

5 Select: TEXT.

6 Put the COMPUTIST disk in drive 2.

7 Select the file you want to print and press G

8 Program asks: DO YOU WANT A PRINTOUT (Y/N)? Press Y

David M. Craig

Softkey for...

Little Computer People's House on a Disk
Activision

After reading Henry P. Dowst softkey in COMPUTIST #49, I tried the same softkey that he did for *Shanghai*. I found that it also deprotected *Little Computer People's House on a Disk* (LCP).

To make the disk just 'like new' (where you start out with session one and it asks you for your name), see step 6.

1 Copy the LCP disk with any copy program.

2 Using your favorite sector-editor, look for the string which begins with A9 56 85. I found it on track $00, sector $0A, beginning at byte $73.

3 Look ahead until you find the string 38 2A 25 FC. I found this string at byte $B1.

4 Starting with byte $73 change all bytes to EA's until and including byte $B2, this should leave you next to the string 25 FC.

5 Change the bytes with values 25 FC to A9 FF.

6 NOTE: Make sure side B is inserted. With any sector-editor read track $0E, sector $0F.

Starting at byte $00, change all bytes to 00, except the last byte at $FF. Leave the last byte on the track alone then write the sector back to the disk.

Now you have a deprotected disk which can be copied with any copy program.

Tim Snyder

Softkey for...

Think Quick
Learning Company

1 Copy both sides of the original disk with *COPYA*.

2 Use your favorite sector editor to scan the first side of the disk for these bytes: 60 DD 88, and change them to 60 60 88.

NOTE: all you are changing is the DD.

I found this sequence of bytes on: track $02, sector $0F and track $0B, sector $06.

3 The same bytes are found on the same tracks and sectors on the second side as well, just change them to the same as above.

4 Now you have a deprotected *COPYA*-able copy for back-up purposes only!

Trevor Drover

Softkey for...

PrintMaster Plus
Kyocera Unicon, Inc.

■ **Requirements**

- ☐ *PrintMaster Plus* disks
- ☐ *Copy II Plus* (ProDOS version)
- ☐ Four blank disks

PrintMaster Plus comes out on two disks. For convenience it is best to keep them on two disks if possible, or printing becomes a bit of a pain.

The protection seems different on both disks as I needed two different approaches to backing up the originals. Moving all the files to an unprotected disk proved very easy indeed.

1 Start by formatting the four blank disks to ProDOS, called PM1, PM1A, PM2, PM2A. On all disks create a subdirectory called *SYS*. On PM2 create another subdirectory to *SYS* called *BOOTDIR*.

2 Now boot up *PrintMaster* disk 1. When the ProDOS message clears you will see the BASIC prompt. This is also our prompt to jump in with [C] and stop the execution of the BASIC program.

3 Take out *PrintMaster* and slip in *Copy II Plus* (I use version 7.3) and type:

-/COPYIIPLUS/UTIL.SYSTEM/

We are very lucky. Here we have an operating system that can read the protected and standard DOS, and write to a formatted ProDOS disk. This is all we need to deprotect these disks.

4 Insert the *PrintMaster* disk 1 and PM1A in appropriate drives, and using the *COPY FILES* utility of *Copy II Plus*, transfer the 3 files from the root directory and the 22 files from the SYS directory to the corresponding directories on PM1A. This takes a while.

5 Swap disks over, *PrintMaster* disk 2 and PM2A into your drives. This time there are 28 files all under SYS directory, so transfer them again to the SYS directory on PM2A. This takes longer!

6 Now, good as ProDOS is, you cannot easily transfer files from one disk named PM1 to another named PM1, hence an intermediate transfer to PM1A. As *PrintMaster* expects the disks to be called PM1 and PM2, we must transfer all those files back to the appropriately named disks, as we did before. Easy, but time-consuming, so get to it. The end result is a *COPYA*-able and RUNable version of *PrintMaster Plus*.

John Paul Quinn

Attn: Mr. Clay Harrell

First, let me thank you for the excellent article ***Deprotecting Dazzle Draw***, in COMPUTIST #21.

I have followed your procedure to the letter and found that everything works fine up until I create the dummy ProDOS file in the main directory. Unfortunately, all of the sector-editors I have, *Bag of Tricks*, *Probyter*, *Prozap*, etc., all read the ProDOS disks in blocks. With my conversion, I come up with track $00, sector $0B as the second half of block $0200.

Anyway, when I go to change the bytes mentioned in the article ($EE, $3B and $3C), they all appear as 00. As a matter of fact, the whole sector appears as 00's.

When you say, in your article, that we wish to make our dummy ProDOS file identical to the one on the utilities subdirectory, I guess I get lost. Since I have only 10 blocks left after converting the *Dazzle System* and putting it back out on tracks $1F—$22, I am not sure what you mean by making the dummy ProDOS file identical to the real one.

Other than that, I have a *COPYA*-able, runnable *Dazzle Draw*. Unfortunately, I have to boot, like you say, a normal DOS 3.3 disk or start off from BASIC on the ProDOS Users Disk.

(?) Any help or clarification you could offer would be greatly appreciated.

Paul D. Dillon

I miss the better binding and hard cover magazine. However, if it was necessary for cost reduction, I can accept that. The magazine content and survival are the two most important factors.

I like the new format with more softkeys. I also like the repeat and different softkeys. Many times the protection is different and a different method will work.

(?) *Silent Service* is a prime example. I am still waiting for one to work here. The December issue was close, but still didn't get rid of the enemy mines for my version. You have the best Apple II magazine I have ever seen. Please keep up the good work.

Thomas V. Rapheld

A.P.T. for...

Alternate Reality: The Dungeon
Datasoft

Use a sector-editor and...

Create A Super-human Character

■ **Requirements**

- ☐ Sector-editor
- ☐ *Alternate Reality* character disk

With a sector-editor and a few changes on your character disk you can create a super-human character.

By changing the byte at $08 and at $0C on track $00, sector $0F to hex value 78 you will always be able to bring a lost character back to life.

The following areas, all on track $09, sector $07, will alter your character's attributes:

Table 1.....*Attributes*.....

Attribute	$Location	$Max Value
Stamina	49,4A	78,78
Charm	51,52	78,78
Strength	59,5A	78,78
Intelligence	61,62	78,78
Wisdom	69,6A	78,78
Skill	71,72	78,78
Speed	79,7A	78,78
Hit Points	45,46,47,48	A0,A0,A0,A0

There are many other areas that I have found and yet there is much more to this investigation. The biggest problem faced is that the program converts both ASCII and hex values to its own language.

Table 2.....*Alphabet Conversion*.....

A	C6	**a**	E6	**N**	C9	**n**	E9
B	C5	**b**	E5	**O**	C8	**o**	E8
C	C4	**c**	E4	**P**	D7	**p**	F7
D	C3	**d**	E3	**Q**	D6	**q**	F6
E	C2	**e**	E2	**R**	D5	**r**	F5
F	C1	**f**	E1	**S**	D4	**s**	F4
G	C0	**g**	E0	**T**	D3	**t**	F3
H	CF	**h**	EF	**U**	D2	**u**	F2
I	CE	**i**	EE	**V**	D1	**v**	F1
J	CD	**j**	ED	**W**	D0	**w**	F0
K	CC	**k**	EC	**X**	DF	**x**	FF
L	CB	**l**	EB	**Y**	DE	**y**	FE
M	CA	**m**	EA	**Z**	DD	**z**	FD

Table 3.....*Numerical Conversion*.....

0	87	**16**	97	**32**	A7	etc...
1	86	**17**	96	**33**	A6	
2	85	**18**	95	**34**	A5	
3	84	**19**	94	**35**	A4	
4	83	**20**	93	**36**	A3	
5	82	**21**	92	**37**	A2	
6	81	**22**	91	**38**	A1	
7	80	**23**	90	**39**	A0	
8	8F	**24**	9F	**40**	AF	
9	8E	**25**	9E	**41**	AE	
10	8D	**26**	9D	**42**	AD	
11	8C	**27**	9C	**43**	AC	
12	8B	**28**	9B	**44**	AB	
13	8A	**29**	9A	**45**	AA	
14	89	**30**	99	**46**	A9	
15	88	**31**	98	**47**	A8	

Table 4.....*Other Conversions*.....

space	A7	!	A6
"	A5	#	A4
$	A3	%	A2
&	A1	+	AC
*	AD	)	AE
(	AF	_	D8
`	D9	@	C7

The second problem is that almost all character attributes, whether those shown on the screen during the game or those hidden attributes you earned from doing good or bad deeds, have at least two locations that need to be changed. In most cases, these locations are not even on the same sector. For example, the number of Food Packets is stored on track $09, sector $06 at bytes $E5 and $BB. Both of these locations must to be changed.

The third problem is that the game's method of saving the character to disk changes during the first few saves. Attributes and possessions not listed above should only be investigated on a character disk that has been used to save at least three times.

If anyone can help in this investigation, please feel free to communicate with me.

David G. Alexander

† *Softkey for...*

Car Builder

Optimum Resources

I noticed *Car Builder* by Optimum Resources on the Most Wanted list in COMPUTIST #50 and recall dealing with a defective nibble copy thereof a few months ago which would boot all right but the program would lock up after selecting an item from the main menu.

I analyzed the protection scheme but was unable to verify the crack due to the non-functional source media.

A hard-learned and, in my opinion, valuable piece of advice that I would like to pass on to other COMPUTIST readers is:

"Don't fool around with junk".

Attempting to crack a disk with even a trivial protection scheme will transport you into a world of ridiculous frustration, confusion and wasted time if you are playing with less than a full deck.

Work only with originals or nibble copies (write-protected of course) which are 100% functional on the machine you are using to perform the deprotection.

I think that the following crack for *Car Builder* should work, but would appreciate feedback from other readers in the event that it doesn't.

The protection appears to be the same as the newer *Stickybear* series described by Marc Lirrette in COMPUTIST #26. The protected sector is track $01, sector $0F and it is loaded at $1E00.

The crack is as follows.

[1] Copy the disk using *Locksmith* fast backup, *Super IOB* fast controller with **POKE 775,96**, or anything else that will ignore unreadable sectors.

[2] Boot the original disk.

[3] Boot a DOS disk with no *HELLO* program. (Page $1E00 will not be overwritten by DOS).

[4] Insert the copy into the drive.

[5] Enter the monitor and save page $1E00 to track $01, sector $0F using *SREAD/SWRITE* or the following call to RWTS:

```
CALL -151
300:4C E3 03 4C D9 03
B7EB:00 01 07
B7F0:00 1E 00 00 02
300G
```

[6] Sector edit:

Trk	Sct	Byte(s)	From	To
$02	$06	$20	60 A2 00 A0 00	60 60 00 A0 00

This will disable the alteration of the post-nibblization routine for reading the heretofore protected sector.

If the procedure does not work initially, it could be that the protected sector is loaded at some point subsequent to boot.

The next hack would be to repeat steps 2 through 5 after progressing to a later point in the program, such as after selecting an item from the menu.

Jack Moravetz

Softkey for...

Apple Gradebook v2.6

J & S Software

I used the nibble-editor in *Copy II Plus* to examine the disk format. (It was non-standard.)

Then I used *Controller Writer* from COMPUTIST and came up with a *Super IOB* controller.

However, when the copied disk was booted, it still would not function.

While inspecting the programs on the disk, I noticed that each of the Applesoft files had two line numbers that were doing some DOS switching. They looked like this:

```
6500 POKE -18274, PEEK(-18547): POKE -18123,
     PEEK(-18546): POKE -18031, PEEK(-18542):
     RETURN
6600 POKE -18274,222: POKE -18123,222: POKE
     -18031,222: RETURN
```

I found that changing line 6500 to be exactly like line 6600 would let the program run properly.

1 Initialize a slave disk with *HELLO* as the boot name then delete the boot file.

```
INIT HELLO
DELETE HELLO
```

2 Install the controller into *Super IOB 1.5* and copy the disk. (Don't use the 'format disk' option.)

3 Boot DOS from another disk. Place your copy in the drive and use *FID* or *Copy II Plus* to make sure all the Applesoft files are unlocked. Then load each of the Applesoft files, change line 6500 and save the file back to the disk.

```
LOAD HELLO
6500 POKE -18274,222: POKE -18123,222:
     POKE -18031,222: RETURN
SAVE HELLO
```

On my copy the other file names to change are:
CLASS PREP MODULE
TAGB
CORRECTION MODULE
END OF TERM
DM
CONVERSION

Load, change and save each of these programs. That's all.

Controller

```
1000 REM J & S SOFTWARE APPLE GRADE BOOK V2.6
1010 TK=3:LT=35:CD=WR:MB=151: ONERR GOTO 550
1020 ST=0:T1=TK: GOSUB 490: RESTORE : GOSUB 190: GOSUB 210: GOSUB 170
1030 GOSUB 430: GOSUB 100:ST=ST+1: IF ST<16 THEN 1030
1040 IF BF THEN 1060
1050 ST=0:TK=TK+1: IF TK<LT THEN 1030
1060 GOSUB 230:TK=T1:ST=0: GOSUB 490
1070 GOSUB 430: GOSUB 100:ST=ST+1: IF ST<16 THEN 1070
1080 ST=0:TK=TK+1: IF BF=0 AND TK<LT THEN 1070
1090 IF TK<LT THEN 1020
1100 HOME :A$="ALL^DONE" : END
5000 DATA 213,170,150,213,170,173,228,170,228,170
```

Controller Checksums

```
1000  - $356B      1060  - $6AE6
1010  - $5E3F      1070  - $22FD
1020  - $B92C      1080  - $54D8
1030  - $E2AA      1090  - $7FC2
1040  - $2463      1100  - $BB30
1050  - $E2BC      5000  - $71A9
```

Softkey for...

Super Print!
Scholastic

and for...

World Games
Epyx

These two have the same deprotection method. They are ProDOS programs in a non-standard disk format which makes copying with a standard copier difficult.

I used *COPYA* (with DOS error-checksum disabled) to copy the disks.

I then copied the files over to another ProDOS-formatted disk and they both worked fine.

1 Boot your DOS 3.3 System Master. At the BASIC prompt type:

```
POKE 47426,24
RUN COPYA
```

This will allow you to copy the disks.

2 Use *FILER* or *Copy II Plus* to copy the files to a ProDOS-formatted disk.

Super Print! requires this although it's probably a good idea to copy the files from *World Games* to another disk also. I don't think the volume name really matters, but you could RENAME each to its original volume name later.

Softkey for...

Spy's Adventures in N. America
Polarware

This ProDOS adventure game boots from side two and, of course, side two has the protection. Side one may be copied normally.

I used a modified controller Penguin software (COMPUTIST #13. The ProDOS on this disk was version 1.0.2. I would advise using a **later** version of ProDOS.

1 Install the controller into *Super IOB* and copy the disk. Don't forget to format the copy first.

2 Copy a newer version of ProDOS to the copied disk.

Controller

```
1000 REM SPY'S ADVENTURE
1005 POKE 47426,24: REM IGNORE ERRORS
1010 TK=0:LT=1:ST=15:LS=15:CD=WR:FAST=1
1020 GOSUB 490:T1=TK:LT=TK+1: GOSUB 1060
1025 GOSUB 610: IF PEEK (BUF)<MB AND LT<>35 THEN LT=LT+1:TK=TK+1: GOSUB 1060: GOTO 1025
1030 GOSUB 230:TK=T1:LT=35: GOSUB 490: GOSUB 610: IF PEEK (TRK)=LT THEN 1050
1040 TK=PEEK (TRK):ST=PEEK (SCT): GOTO 1020
1050 HOME : PRINT "DONE" : END
1060 POKE 47445,212+(TK/2=INT (TK/2)): RETURN
```

Controller Checksums

```
1000  - $356B      1030  - $BA9E
1005  - $B23B      1040  - $2F5E
1010  - $8169      1050  - $3F20
1020  - $B93B      1060  - $7AA6
1025  - $6F15
```

Softkey for...

Microzine #23
Scholastic

I noticed *Microzine* #22 & #23 on the Most Wanted list. I could not find anything on #22 that looked or acted like copy-protection. Maybe they forgot to protect my copy.

Microzine #23 has the copy-protection in the boot file called *TOC.1*. It does a check for the original disk and then runs *HELLO*. If you change the boot program with *Copy II Plus* from *TOC.1* to *HELLO*, it will defeat the protection. If you don't have a way of changing the boot program, you can initialize a disk with DOS 3.3 or a fast DOS. Then use *FID* or a DOS 3.3 file-copier to copy the files from the original to the initialized disk.

That's all there is to it.

Peter Green

Softkey for...

California Games
Epyx

1 Turn off error-checking and copy both sides.

```
POKE 47426,24
RUN COPYA
```

2 Make the following sector-edits:

Trk	Sct	Byte(s)	From	To
$00	$05	$43-44	D0 F4	EA EA
		$4C-4D	D0 4A	EA EA
		$55-56	D0 41	EA EA
		$68-69	D0 F4	EA EA
		$6C-79	A0 07 BD 8C C0	EA EA A9 FC 85
			10 FB 99 F0 00	F0 85 F3 A9 EE
			EA 88 10 F4	85 F1 85 F2

With thanks to Willem Moolenaar (COMPUTIST #50).

Jim Bancroft

Copy II Plus parms

I have softkeyed educational software of many publishers when all other methods of back-up fail. I feel strongly that, whenever possible, teachers should not leave 'open-copy' software in circulation.

Here are the *Copy II Plus* parameters, which I developed myself, to successfully copy *Bank Street Filer* 128K and 64K respectively. They work where nothing else has.

Bank Street Filer 128K

T0, SECTOR COPY
T2-T21, 0E = A5, 0F = 96, 10 = BF, 55 = 03 *this is copy by header A596BF)*
T1, 0E = DD, 0F = DE, 10 = DF, 0A = 03, 55 = 03, 44 = 01, 45 = 08, 7E = 01

Recopy track 1 partial auto-copy if it won't boot.

Bank Street Filer 64K

T0, SECTOR COPY
T2-T21, 55 = 03, 0A = 03, 0E = A5, 0F = 96, 10 = BF
T1, 55 = 03, 56 = 01, 0E = DD, 0F = DE, 10 = DF, 0A = 03, 44 = 01, 45 = 08, 7E = 01, 9C = F6

Recopy track 1 partial auto-copy if it won't boot.

Didatech software

I notice that an abundance of Didatech software (FAY) is now on the most wanted list. It is erroneously call Digitech.

Their protection is what all educational software should be. It is a check on track 2 and all the data is from track 3 up.

You can do whatever you want to the files, even alter the hello displays, and the software still works great. They are even using *Pronto-DOS* on their products.

Locksmith quick-copy followed by a *Copy II Plus* sync-copy of track 2 will back it up.

We need more educational software companies like Didatech.

Softkey for...

Mindplay software

Less kind is Mindplay. They also have a track which is checked but it is almost impossible to copy. Look for C9 D5 F0 0F C9 F7 and change the first BD 8C C0 of the sector to 58 60. On one program the call was in an encoded sector but was accessed by a 4C 00 81 (JMP $8100). Put the 58 60 in place of that code wherever it appears on the disk.

Softkey for...

Concepts in Science
Harcourt Brace

In the *Concepts in Science* series by Harcourt Brace, I also found a track-check in memory which was encoded on the disk.

Search for a sector beginning A2 03 B5 00 48 CA and replace the A2 with 60. It was on track $02, sector $08 on the disks I saw.

Some notes on copying:

Unicorn software
Sterling-Swift software
Milliken Reading Series

I noticed an item from *Unicorn* on the list. On one of their products, I found that anything copied it fine, but it wouldn't run and couldn't be accessed from DOS 3.3. Two solutions were possible.

1. Quick & Dirty Method: Search for the usual BD 8C C0 followed by strange compares (C9 xx) and change the A9 xx which leads the sector into 18 60.

2. Thorough & Clean Method: Capture the RWTS and use a swap controller to put $03 to $22 onto a normal disk. Sector edit track $11, sector $00 to change $F1 to 11. Once done, you find that the boot program does a call to 768 which is the sector modified in method 1 above. Remove the call and the disk works great.

The reason the swap controller was necessary on a copyable disk is that their sector interleave table is strange, thus stopping your access by DOS 3.3 utilities to individual files as well as the catalog (the altered VTOC on track $11, sector $00 was also for that purpose even if you normalized the disk). The sector interleave method is also used in software by Sterling-Swift.

Protection of this type is why I say that producers of educational software should follow Didatech's lead by protecting the product but leaving access to the files with our utilities. The day someone blows a "protected" disk containing student data you will know why this is vital.

Check the Milliken Reading Series for this problem at its worst. The students write and forget their own secret passwords ("names"). A swap controller putting tracks $3—$22 onto a normal disk handles that series and gives you access to their records with your DOS utilities.

Softkey for...

Le Francais par Ordinateur
D.C. Heath

Regarding *Le Francais par Ordinateur* by D.C. Heath, search for C9 D5 D0 F5 A0 00 and make the BNE go to byte $C7 (D0 5A). This bypassed all the compares but left the stack the way they wanted it.

Help! Softkeys needed for Pascal-based software

? Will someone please tell me how to produce a working copy of Houghton-Mifflin Pascal-based programs and the Pascal-based products produced by Entrex for Hartley.

They are decoding the disk as they read it into memory. There is no problem finding the disk check in memory (BD 8C C0) but it isn't on the disk.

Copying the track checked is useless, unless you adjust drive speed.

Jim S. Hart

Ultima III Encounter Editor bug fixed

I found a small bug in my *Ultima III* program published in COMPUTIST #48.

Line #1190 should read:

1190 For I = 1 TO LEN (IN$)

This allows the user to edit the maps correctly.

? Does anyone have softkeys for the IIgs versions of *Print Shop* and *Tower of Myraglen*?

Also, when sending in softkeys for IIgs programs, could users also send in a short disassembly of the protection scheme and a short explanation of what is going on? It would help the rest of us tremendously.

Softkey for...

Ultima I
Origin Systems

This is a softkey for the newly re-released *Ultima I*. The original was written in BASIC while the new one has been rewritten in assembly language. Excellent game.

To softkey it, follow these steps:

1 Disable DOS error-checking and use *COPYA* to copy the disk.

POKE 47426,24
RUN COPYA

2 Boot your ProDOS file-copying program. I used *Copy II Plus v7.4*.

3 Copy the ProDOS file from your file-copying program disk onto the copied *Ultima I* disk.

You are done!

Playing Tip for...

Ultima IV
Origin Systems

Mixing up Brittania & the Underworld

To see a fascinating new world in *Ultima IV*, take out your *Britannia* disk and insert the *Underworld* disk while playing the game.

Make sure your character is standing still when you do this. Now, whenever you move far enough so that the disk is accessed, a new landscape will unfold before you.

The treasure chests never disappear even after you open them! Beware: you may get stuck with no exit so have your *Britannia* disk handy.

Recovering from an *Appleworks* crash

If *Appleworks* crashes or locks up on you, try these steps to start the program back up:

RESET	*to enter the monitor*
C073	*selects bank zero on some memory cards*
3P	*Turn on 80 columns*
2F0:2C 83 C0 2C 83 C0 4C	
2F7:33 10	*for versions 1.1—1.3*
2F7:27 11	*for version 2.0*
2F0G	*Start it back up*

Save any files you have on the desktop (do nothing but save) and reboot after using this routine.

If the main menu appears messed up, just press ESC.

Kudos for Tom Weishaar's OPEN—APPLE

Note: This procedure is not mine: it is from Tom Weishaar's excellent newsletter ***OPEN-APPLE*** volume 3, #4, May 1987.

I really recommend this newsletter for all serious Apple users. The information it contains is not found elsewhere, is written in an easy-to-read style, and above all is interesting and relevant.

I haven't had enough money recently to get a subscription, but I have seen a couple of issues. I enjoyed every one that I had the opportunity to read.

I needed a patch to *Appleworks* so that the "Press the SPACEBAR to continue" prompt would be taken out for those of us who have *Appleworks* on a 3½" or hard-disk. It really is irritating to have to press SPACE instead of going straight to the "Enter Date" prompt.

Well, I wrote Mr. Weishaar a letter, and in two weeks I received a program listing that would not only take care of the Spacebar prompt, but also take out the Enter Date prompt, too, in case the user's computer has a built-in clock (like the IIgs). That's what I call classy service to a total stranger!

When I get up enough extra money, I'm going to add ***Open-Apple*** to my subscription list along with Computist.

Just for the record, we here at COMPUTIST read every issue. I especially like the comic in each issue. Those of you interested in subscribing can write to:

Open Apple
P.O. Box 7651
Overland Park, KS 66207

$24 - 1yr (12 issues)

..... RDEXed

Another good source of Apple information is Don Lancaster's '***Ask the Guru***' column in every month's issue of the Computer Shopper.

Don is an *Applewriter* fanatic (like me) and continuously puts out *Applewriter* patches and enhancements.

He was the first to put out the *Applewriter* patch that allows it to print correctly on a IIgs.

A beef with Utilico

As for negative commentary, the only company I have had a beef with is Utilico. I bought *EDD v3* about 2 years ago and sent in the registration card. The program is on both sides of the disk; main on front, backup on back.

I called Utilico and asked for the parms to make a backup of my *EDD v3* 'in case' of an accident. I was told that a backup had already been supplied on the reverse side of the disk and to get another, I would have to send them $15. I told them that 99% of the time, if one side of the disk dies, the other side dies as well. They said "We're sorry" and I said to myself "I'm sorry I bought this for $79.95".

This is what started me on the road of deprotection. I eventually converted my *EDD v3* (with Computist's help) into an unprotected file and have hidden the original disk. The original, due to the protection scheme, would not even boot half of the time.

I will never get an upgrade or buy anything else from Utilico because of their replacement policy.

In all fairness, the $15 replacement fee is pretty much standard in the industry with only a few software companies having a more enlightened policy. ..... RDEXed

The idea of using RDEX as a forum for pros, cons, and experiences is definitely an excellent idea. I have many old issues of SoftTalk (R.I.P.) and I still enjoy reading the Open Discussion section where readers aired out their thoughts on all sorts of Apple-related topics. I hope COMPUTIST and the readers take up this tradition!

Softkey for...

California Games
Epyx

A friend of mine recently gave me the pleasure (?) of cracking this gem. It wasn't easy, but I did it. The enclosed disassemblies hopefully give some insight into the protection scheme.

My first attempt at deprotecting it (**B942:18**, *COPYA*, & the *Destroyer* crack) brought no luck. The copy just sat there, as if it didn't know what to do. Well, it didn't!

Using your sector editor (I use *Copy II Plus v5.5*), read in track $00, sector $00. This is pretty much a standard DOS 3.3 boot except at $94A (in reality $84A). There is supposed to be a JMP ($08FD) [6C FD 08] but instead there is a JMP $BB00 [4C 00 BB]. Clue #1!

As I said before, this is a standard 3.3 boot so track $00, sectors $01—$09 get loaded into $B700—$BFFF (sector $01 into $B700, etc). Thus, track $00, sector $05 is loaded into $BB00.

This is where the protection is. The other disassembly is of this code. In essence, it looks for a byte sequence on disk and when found, it loads the next 8 bytes into locations $F0—$F7. These locations are then referenced to decode the next stage of the boot sequence from $B700—$BAFF.

This is why the disk hangs. The next boot stage hadn't be correctly de-crypted and it didn't know what to do. The trick is to put the correct values into $F0—$F7 and then go to the routine that does the decoding and jumping to the next boot stage. This decode/jump to next stage routine starts at track $00, sector $05, byte $7A ($B7A in memory).

What we need to do is overwrite the protection code with code that loads the correct values into $F0—$F7, and jumps to $BB7A. What you do is enter the routine that stores the correct bytes at $F0—F7 then NOP out (put

SEA in place of) the rest of the bytes up to and including byte $79 of track $00, sector $05 and write the sector back to disk.

```
A9 FC    LDA  #$FC
85 F0    STA  $F0
A9 EE    LDA  #$EE
85 F1    STA  $F1
A9 EE    LDA  #$EE
85 F2    STA  $F2
A9 FC    LDA  #$FC
85 F3    STA  $F3
A9 E7    LDA  #$E7
85 F4    STA  $F4
A9 EE    LDA  #$EE
85 F5    STA  $F5
A9 FC    LDA  #$FC
85 F6    STA  $F6
A9 E7    LDA  #$E7
85 F7    STA  $F7
```

I broke into the monitor early during the boot (I can't boot-trace on my Laser 128) and recorded these values in $F0—$F7, if you were wondering where I got them! Write this sector once again back to disk.

Your *California Games* is now deprotected. Don't forget to normalize the back side of the disk too (**B942:18**, *COPYA*).

1 Use *COPYA* to copy both sides of the disk, ignoring errors.

POKE 47426,24
RUN COPYA

2 Use a sector editor to change the following on the front side of the disk:

Trk	Sct	Byte(s)	From	To
$00	$05	$00	?	A9 FC 85 F0 A9 EE 85 F1 A9 EE 85 F2 A9 FC 85 F3 A9 E7 85 F4 A9 EE 85 F5 A9 FC 85 F6 A9 E7 85 F7

3 Replace all of the remaining bytes up to and including byte $79 with EA's.

4 Write the sector back to disk.

Enjoy!

Softkey for...

European Nations and Locations

Designware

■ Requirements

- ☐ *Locksmith* Fast Copy or other whole-disk copier
- ☐ Sector-editor with search capability
- ☐ Blank disk

1 Copy the original to a blank disk with any whole-disk copier like *Locksmith* fast copy.

2 Use your sector-editor (I use *Copy II Plus v5.5*) to search for the byte sequence A9 38 8D 9E B9 and replace it with EA EA EA EA EA.

3 Write the sector back to disk and you're done!

† Softkey for...

Where in the USA is C. Sandiego

Broderbund

1 Using any bit copier with default settings, copy both sides to 2 blank sides.

2 Make the following sector edits to side #1 of the copy:

Trk	Sct	Byte(s)	From	To
$00	$01	$7D-$7F	4C 00 1F	18 90 F4
$00	$02	$00-$02	78 AD 82	4C 00 60

Don't forget to write the sectors back. This disk is now in 'bit-copyable' format. The sector edits circumvent the signature check. Track $00 is in normal 16-sector format while the rest of the disk is in a non-standard (not 16 sector) format. Side #2 is in the same format for tracks $00—$22.

Any additions to this softkey, i.e. converting the rest of the disk to standard 16 sector format, would be appreciated.

Softkey for...

The Black Cauldron

Sierra On-Line

■ Requirements

- ☐ Original *Black Cauldron* disks
- ☐ 5 blank disk sides
- ☐ Whole-disk copier such as *COPYA*
- ☐ Sector-editor/disk-searcher

Whenever a friend of mine purchases a new Apple program, I am usually asked to deprotect the disk(s). This gives me the opportunity to sharpen my deprotection skills (which has the side benefit of helping me learn machine language) and also adds to COMPUTIST's softkey list so others may protect their investment.

Let's take a look at Sierra On-Line's new 128K adventure, *The Black Cauldron*. Smooth animation, double hi-res graphics, and an interesting storyline make this a 'must have' game for beginning adventurers and youngsters just starting out on computers.

The protection wasn't too shabby. The original 5 sides are *COPYA*-able but the resulting copies won't function correctly.

Noting that 1) the disks were *COPYA*-able, and 2) the manufacturer was Sierra On-Line, I guessed that the protection was a nibble-count of some sort.

Let me digress for a moment. In the protection business, there are essentially two major protection catagories: 1) format alterations, and 2) signature checks.

Format alterations deal with how the programs are put on the disk such as half-tracking, altered prologs or epilogs (Worth & Lechner's ***Beneath Apple DOS*** explains this well), or unformatted tracks. These types of protections cannot be copied with *COPYA* unless modifications are made to the program.

On the other hand, signature-checks, such as nibble-counting and track-imaging, to name a few, are usually copied quite easily with *COPYA* but the resulting copies do not work.

I searched the disk for the byte sequence 8C C0 and found the following on track $11, sector $0F starting at byte $10.

```
10- BD 89 C0  LDA $C089,X  turn on disk drive
13- A9 05     LDA #$05
15- 8D 00 BB  STA $BB00    PROTECTION
18- 20 47 FF  JSR $FF47    SETUP
1B- 10 01     BPL $091E
1D- 20 C8 C0  JSR $C0C8    hidden instruction
20- 30 5D     BMI $097F    never taken
22- 8C C0 90  STY $90C0
25- F8        SED
26- BD 8C C0  LDA $C08C,X  get a disk byte
29- 10 0A     BPL $0935
2B- C9 C9     CMP #$C9     is it right?
2D- D0 0D     BNE $093C    nope, go bomb
2F- BD 88 C0  LDA $C088,X  yes, turn off drive
32- 4C 43 FF  JMP $FF43    continue loading
```

At bytes $2B—$2C, it checks for the byte C9 and if it doesn't find it then the disk won't boot any farther. On a hunch, I changed the C9 C9 to a 29 00 (AND #$00 - forces a zero result). I tried to boot the disk now and guess what? It works like a champ!

1 Use a whole disk copier such as *COPYA* to copy all five sides of *The Black Cauldron* to the blank disks. After you have finished the copying, put the originals in a safe place. We're done with them.

2 Sector edit:

Trk	Sct	Byte(s)	From	To
$11	$0F	$2B-2C	C9 C9	29 00

If you don't find it there, then use your disk search command to find where they moved the code.

The moral of the story is this: To find a nibble-count in most cases, search the disk for the byte sequence 8C C0. When (and if) you find it, look at the code around it to see if it is looking for something unusual on the disk. Change the comparisons so that they are always 'correct' and then write that sector back to the *COPYA*ed disk. Boot it to see if it works. If it doesn't then either you have missed something or there is another check somewhere else on the disk (maybe even encoded!).

If you still can't find it, don't dispair: you can always count on COMPUTIST for answers.

Softkey for...

Regatta

Howard W. Sams & Co., Inc.

■ Requirements

- ☐ Apple II Plus, IIe **or** a way to get into the monitor at will
- ☐ *Regatta* original
- ☐ Blank disk
- ☐ *Super IOB v1.5*
- ☐ Fast DOS (optional)

Regatta is a somewhat enjoyable (I'm a landlubber) sailing simulation game put out by the folks at Howard W. Sams & Company, Inc. Eric Peterson and Joe DeMuth, the co-authors, have done well in their re-creation of this sailing event for the Apple. The one drawback, however, is that it is copy-protected.

I rarely use bit-copiers since it only duplicates the disk, copy-protection and all. The copy usually doesn't work as well and has a tendency to crash.

Deprotecting the disk is a much better alternative. Faster booting, inspection of the programming techniques, and the ability to make an easy backup are all fringe benefits of the deprotection process.

Checking out *Regatta*'s format with *DiskView*, I discovered that the only differences between this DOS and normal DOS are the epilog bytes. They have been changed from DE AA to FF FF.

This is easy to defeat with a **POKE 47426,24**. After making this POKE and trying to catalog the disk, all that showed up was garbage. Rechecking the disk's format showed that there were no changes other than the altered epilogs as mentioned above.

Hmm. That meant something else wasn't right. Looking back through my old notes and back issues of COMPUTIST, I came up with the probable answer: altered translate tables (refer back to the *Ultima IV* softkey in COMPUTIST #28 for a more in-depth explanation of what they are).

Being lazy like most computer users, I decided to try *Super IOB*'s swap controller with *Regatta*'s RWTS.

What do you know, it worked. Outlined here are the steps needed to convert *Regatta* from user-FIENDLY to user-FRIENDLY form.

[1] Boot up DOS 3.3 or equivalent and initialize the blank disk.

```
INIT HELLO
```

[2] Now we must capture the RWTS so the swap controller can be used. Let's modify Boot Ø so it will load Boot 1 into memory and then enter the monitor (for more info on 'Boot Ø' and 'Boot 1' check out ***Beneath Apple DOS***, Chapter 8, pages 1-3). Put your *Regatta* original in drive #1 and then enter these commands (If you have a way to go into the monitor at will, ignore this step and go to step #4).

```
CALL -151
9600<C600.C6FFM
96FA:98 N 9801:AD E8 C0 4C 59 FF
9600G
```

[3] The drive will turn on, rattle for a second, then beep and drop you into the monitor. Now, we have to move Boot 1 to a safe place and modify it so the *Regatta* RWTS is read into memory and control returns once again to the monitor.

```
9800<800.900M
980E:90
984A:4C 59 FF
9600G
```

[4] (If you can go into the monitor at will, boot up the *Regatta* original and go into the monitor when you are asked if you will be using the keyboard or joystick.)

When the computer beeps this time, the *Regatta* RWTS is lying in its final resting place of $B8ØØ—$BFFF.

It might interest you to know that the bytes changed at $984A (6C FE BB) in Boot 1 would have jumped to a nibble-count. The two bytes at $BBFE were ØØ BD so the indirect jump would have gone to $BDØØ. In your spare time, look around there to see what a nibble-count looks like.

We need to move the RWTS down to a safe place so a DOS disk can be booted.

```
1900<B800.BFFFM
```

[5] Insert the blank initialized disk in the drive and boot it.

[6] Save the RWTS so that it can be used in the swap controller.

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

[7] Finally, merge the swap controller with *Super IOB*. Type the two lines below so that the *Regatta* DOS is not copied and the RWTS is loaded.

```
10010 TK = 3: LT = 35: ST = 15: LS = 15: CD = WR:
      FAST = 1
10010 PRINT CHR$ ( 4 ) "BLOAD
      RWTS.REGATTA, A$1900"
```

You now have a deprotected copy of *Regatta*. It does not work on the Laser 128 but neither does the original for some reason.

The method I used to capture the RWTS can be used on several other disks with format changes as their only protection. Enjoy !!!

Softkey for...

Elite

Firebird Software

■ Requirements

- ☐ *Elite* original disk
- ☐ A blank disk
- ☐ Apple II Plus w/16K RAM card or a way into the monitor at will
- ☐ *FID* from the DOS 3.3 System Master disk
- ☐ A fast DOS (unless you like to wait)

Ah, today was payday and I was on the hunt for a good game. Perusing through the computer stores, I came upon a game called *Elite*. The name clicked in my mind.

It was a top-notch space flight/combat simulation/adventure style game from the reviews I had read. Money changed hands and I was the proud owner of this computer treat.

The manual was well-written and provided plenty of information. Also included in the package were a novella based on the game, a poster with all of the possible ships one might meet, a quick key control guide, an addendum for Apple users with corrections and updates to the manual, and a membership application for the Order of the *Elite*. These support materials are excellent and give one a feel for the game.

After getting all of the manuals and papers out of the package, I noticed something I didn't like: only one game disk with no backup. Since I knew this disk was going to get a lot of wear in the next few months, a backup was needed.

Another thing that annoyed me was that the original would not boot on my Laser 128 (Apple IIe and IIc compatible). It would boot, however, on a II Plus and IIe.

This prompted me even more to deprotect it, since I could never play it at home.

What follows are the ways I tried to deprotect this disk. The earlier ones failed but the last one, which was a combination of hard work and luck, finally succeeded.

A cookbook method is presented at the end for the 'bottom line folks' among you. I hope my ramblings through all of this will help out others in the quest to rid their software of protection.

What I Did First

I decided to disable DOS's error-checking and see if the disk could be cataloged. Here is how to disable the error checks:

```
CALL -151
B942:18
BE48:18
CATALOG
```

Surprise!

A catalog shows up now. Trying to LOAD or BLOAD the files, however, will get you nowhere fast. Notice that you get a FILE NOT FOUND message on some of the files.

Later examination shows that the files *ELITE*, *ELA*, and *SEC3* have an invisible imbedded [E] as the second character in the filename. Aside from this, you still can't load any of the files. Hmmm...missed something.

"Well", I figured, "let's try to copy the disk with *Super IOB* and a modified Fast controller that disables the error-checks (almost like we did a minute ago when CATALOGing)".

To try this, load up *Super IOB v1.5*, merge the Fast controller into it, and add these lines:

```
1015 TK = 3
1020 POKE 47426,24 : POKE 48712,24 : GOSUB
     490 : GOSUB 610
1025 POKE 47426,56 : POKE 48712,56
RUN
```

The modified Fast controller seems to work like a champ copying the disk. Putting a fast DOS on the first three tracks with *Copy II Plus* was all that had to be done to crack the disk or so it seemed.

Note: I found out about the [E] character in the filenames at this time.

The copy booted up and when it got to the first file to execute it rattled and died.

Looking through all of the file's track/sector lists (again using *Copy II Plus*), I discovered that the disk was encoded or the copying process messed the T/S lists up because some of the files were supposedly on track $44(!), among other odd track numbers.

Well, it was time to try something else.

Next In Line

DEMUFFIN PLUS is an old *FID*-like utility to transfer files from a protected disk, using their odd RWTS, onto a normal disk using an internal normal RWTS. It has worked on other 'crack-proof' disks so I figured I'd give it a try here.

One problem was that the disk would not boot on a Laser 128 so it was time to go over to a friend's house who had a II Plus.

The trick with *DEMUFFIN PLUS* is to use their DOS. This means we have to either capture it or load *DEMUFFIN PLUS* into memory and use it after the *Elite* disk had been booted.

Option #2 was ruled out when upon pressing [RESET] the computer scrambled memory and rebooted.

That left us with the task of capturing their DOS.

Finally, We Go In The Right Direction

This is where the Apple II Plus w/16K RAM card comes in. A card which allows you to go into the monitor at will (*Wildcard*, *Replay II*, etc.) will work also. The idea is to get the *Elite* DOS into memory, break into memory, move the DOS to a safe location, and then save it to a normal disk.

There are probably other ways to do this, several in prior issues of COMPUTIST, but this is the way I went about it.

Boot up DOS 3.3 (preferably a fast DOS) and initialize the blank:

```
INIT ELITE
DELETE ELITE
```

Now we have to set up the RAM card so that when [RESET] is pressed, you are dropped into the monitor. Curious folks should read through Wes Felty's ***More ROM Running*** article in COMPUTIST #34.

```
CALL -151                    enter monitor
C081 N C081                  write-enable RAM card
D000<D000.FFFFM              move ROM image
FFFC:59 FF                   change RESET vector
C080                         enable RAM card
```

(insert *Elite* disk)

```
C600G                        boot disk
```

When the Applesoft prompt appears, open the disk drive door and press [RESET].

Wildcard and *Replay II* owners should go into the monitor here. What you should be looking at now is the monitor prompt. The thing to do now is to see if we can 'activate' the *Elite* DOS. On several disks, when you do this the computer will lock you out. Luckily, that is not the case here.

I checked out the standard DOS 3.3 warmstart & coldstart locations to see if they were normal. The normal warmstart location is at $9DBF and the normal coldstart location is at $A851.

I suggest you look around these areas in normal DOS 3.3 sometime to get an idea of what the code around those locations looks like.

Elite's DOS turns out to be non-standard. This prevents the use of *DEMUFFIN PLUS*.

There is some odd code around the warmstart & coldstart locations so that ruled out the easy way.

The hard way is to go a-huntin' through the DOS for code that looks similar to normal DOS 3.3 warmstart and coldstart code. After trying several different locations (with some nasty results), I found both locations.

The warmstart location is at $AA1D and the coldstart location is at $AB8F.

Go ahead and activate the *Elite* DOS with the command:

```
AB8FG
```

You will find out that you can now CATALOG the *Elite* disk. You can even load three of the files:

E[E]LITE
E[E]LA
and *S[E]EC3*

It seems strange that the other two files, *SCRN* and *ELB1*, the ones without control characters in them, cannot be BLOADed. Trying to do so will get you some nasty noises from your disk drive.

Well, let's get what files we can here and worry about those other two files later. BLOAD the two binary files in a safe place:

```
BLOAD E[E]LA, A$A00
BLOAD S[E]EC3, A$8000
```

Now boot up the blank initialized disk, save one file, move the other file back to where it is supposed to be, and then save it:

```
BSAVE ELA, A$A00, L$6720
CALL -151
2000<8000.8500M
BSAVE SEC3, A$2000, L$4FA
```

If you are curious as to how I know the addresses and lengths of the files, here is how I found them out:

First I zeroed out main memory ($800—$9500) with the monitor command **800:0 N 801<800.9500M**, and BLOADed one of the files.

Then I scanned through memory until I found out where the code started.

Adding the number of sectors minus one to the starting address gave me an approximation of the end. Now, all that was needed was to find the exact end and then calculate the length (END - START + 1). Repeat this for the other file.

Notice that when these files were saved, the control character was omitted. You can leave it in but then you have to type it in all of the time when you want to access the file. I prefer to do things the easy way.

We now have two of the machine language files and need to get the other two. The BASIC file does not need to be copied since we will use our own. You can load it and look at it if you want.

I spent some time playing around with the *Elite* DOS trying to load the other two machine language files up but I had no success. These files would not load.

I then realized that these files were executed after the two copied files were executed. This led me on a fruitless search for the code that modified the *Elite* DOS.

I was now desperate and would try even the oddest thing in order to get these two files.

On a whim, I loaded up normal DOS, modified it to ignore errors (shown earlier in this article), and then ran *FID*. Since the disk could be copied with these changes, albeit incorrectly, why not try it on the two renegade files?

Maybe file-by-file copying would work. If you've been following along, you have discovered it did indeed work! This caught me by surprise but as the old saying goes "Sometimes it's better to be lucky than good".

Copying the two files to the copy disk gives us four machine language files. All that we need to do now is to add the *HELLO* file that we didn't copy and everything should work fine.

```
10 TEXT : HOME : D$ = CHR$(4)
20 VTAB 5 : HTAB 15
30 PRINT "E^L^I^T^E"
40 PRINT D$; "BRUN ELA"
50 PRINT
60 PRINT D$; "BRUN SEC3"

SAVE ELITE
```

This does in fact work. Those of you who used a fast DOS have discovered that the loading time has been reduced by at least 50% and it will now work on a Laser 128 (hurray for me!).

I have written more on my failures, pertaining to deprotection methods, in this article than I normally do. Hopefully, this will show what you have to go through for the tougher disks. Also, maybe I've helped show someone a new method that they haven't tried before.

Remember: the final winner in this is you, the user.

The Cookbook

[1] Initialize the blank copy disk:

```
INIT ELITE
DELETE ELITE
```

[2] Copy the two files named SCRN and ELB1 to the copy disk:

```
CALL -151
B942:18
BE48:18
BRUN FID
```

[3] Type in the greeter program and save it to the copy disk:

```
10 TEXT : HOME : D$ = CHR$(4)
20 VTAB 5 : HTAB 15
30 PRINT "E^L^I^T^E"
40 PRINT D$; "BRUN ELA"
50 PRINT
60 PRINT D$; "BRUN SEC3"
SAVE ELITE.WAIT
```

Note: If you have a *Wildcard* or *Replay II*, go to step #5.

[4] Fix up the RAM card to break into the *Elite* program & DOS:

```
CALL -151
C081 N C081
D000<D000.FFFFM
FFFC:59 FF
C080
```

[5] Insert the *Elite* disk and boot it:

```
C600G
```

[6] When the Applesoft prompt appears, open the disk drive door and press RESET to enter the monitor.

[7] Activate the *Elite* DOS and load the other two binary files into a safe memory area so a boot won't damage them:

```
AB8FG
BLOAD E[E]LA, $A00
BLOAD S[E]EC3, A$8000
```

[8] Take out the *Elite* disk, insert the copy disk, and boot it:

```
PR#6
```

[9] Save the first file, move the second to it's correct memory location, and then save it also.

```
CALL -151
BSAVE ELA, A$A00, L$6720
2000<8000.8500M
BSAVE SEC3, A$2000, L$4FA
```

[10] Rename the boot file so the disk will now boot:

```
RENAME ELITE.WAIT,ELITE
```

You're done! Enjoy the backup.

How to Turn
Nibbler and *H.E.R.O.*
into BRUNable files

■ **Requirements**

- ☐ A way to RESET into the monitor
- ☐ Blank initialized DOS 3.3 disk
- ☐ *Nibbler*
- ☐ *H.E.R.O.*

Recently, I converted a friend's two original game disks into file versions so that they would take up less disk space and would load faster.

A side benefit is that the original *Nibbler* disk would not run on my friend's IIgs, but the file version will.

The file version of *H.E.R.O.* allows a hacker to find where the number of men is kept for the art of A.P.T.!

Here are the steps:

Softkey for...

Nibbler

[1] Boot the original *Nibbler* disk.

[2] When the title screen comes up, reset into the monitor.

[3] Take out the *Nibbler* disk and insert the DOS 3.3 disk.

[4] Boot the DOS disk.

```
C600G
```

[5] Patch DOS to allow a long file.

```
POKE 43364,255
```

[6] Save the binary file to disk.

```
BSAVE NIBBLER,A$90E,L$8200
```

That's it!

Softkey for...

_H.E.R.O._
Activision

[1] Boot the original *H.E.R.O.* disk.

[2] When the game starts, reset into the monitor.

[3] Move some memory to protect it from the boot.

```
2000<0.1EFFM
```

[4] Boot the DOS 3.3 disk.

```
C600G
```

[5] Enter the monitor and add this memory move routine:

```
CALL -151
1F00:A2 00 BD 00 20 9D 00 00
1F08:E8 D0 F7 EE 04 1F EE 07
1F10:1F AD 07 1F C9 1F D0 E8
1F18:6C F2 03
```

This routine moves memory from $2000—$3EFF to $0000—$1EFF.

[6] Save the binary file to disk.

```
BSAVE HERO,A$1F00,L$7100
```

That's it!

Softkey for...

Tass Times In Tonetown
Activision

■ **Requirements**

- ☐ Apple II series computer
- ☐ Non-IIgs original *Tass Times* disk
- ☐ A blank disk
- ☐ Disk-copy program like *Locksmith* fastcopy
- ☐ *PRODOS* and *BASIC.SYSTEM* files

Tass Times in Tonetown (TTT) is a graphics/text adventure put out by Activision. The IIgs version includes the slickest title screen

music yet heard. The object of the game is to rescue Gramps, who has been abducted in Tonetown. The normal method of issuing commands, i.e. the keyboard, for this type of game is enhanced by a Mac-style interface. For many of the commands you can just point-n-click which is why I bought the game.

The disk itself is ProDOS-based. This was discovered by watching it boot. Activision is known for their sneaky protections and yes, this game is protected by one of them.

The Protection

The scheme is similar (actually identical) to the protection in *Spindizzy* and *Murder on the Mississippi* (COMPUTIST #43). Refer to the *Murder...* softkey for a better explanation of the protection scheme.

Scanning through the first *'filename' SYSTEM* file, *ADVENT.SYSTEM*, reveals the offending code at $2566. Look at the disassembly of the code there if you plan to crack other recent Activision releases.

Specifically, what to look for at the start is

```
A9 08     LDA  #$08
C6 FC     CMP  $FC
```

and the end of the code looks like:

```
49 AA     EOR  #$AA
8D yy xx  STA  $xxyy
```

The Crack

To crack the program you need to place a 00 in $FC, a 55 in the accumulator, and then JuMP to the STA $xxyy instruction.

For *Tass Times* here are the bytes to search for:

A9 08 C6 FC D0 04 C6 FD F0

...and when you find them, replace them with:

A9 00 85 FC A9 55 18 90 37.

This causes the correct values to be loaded and the protection scheme to be jumped over.

Many other Activision games are protected in this manner so be on the lookout for them (and don't forget to send the softkeys to COMPUTIST)!

1 Copy the original TTT disk onto the blank.

2 Boot the disk with *PRODOS* and *BASIC.SYSTEM* and get into BASIC.

3 Take out that disk and insert the copied TTT disk.

4 Load the offending program and make the necessary changes:

```
PREFIX / GOLF      this is the name of the TTT disk
BLOAD ADVENT.SYSTEM,A$2000,TSYS
CALL -151
2566:A9 00 85 FC A9 55 18 90 37
BSAVE ADVENT.SYSTEM,A$2000,TSYS
```

You're done!

Don't forget to verify that the bytes you are changing are correct. (A9 08 C6 FC D0 04 C6 FD F0) They may have been moved around.

Softkey for...

Grid Designer
Channelmark Corporation

■ Requirements

- ☐ *Grid Desinger* original
- ☐ 2 blank disk sides
- ☐ *COPYA*
- ☐ Sector editor/disk searcher (such as *Copy II Plus*)

Grid Designer (GD) is a program that allows you to contruct your own grids. After construction, you can either save the design or print it out via printer.

There are approximately 240 pre-made grids already on disk so what you're looking for is probably there.

The program's main appeal for me is it's pre-made COBOL coding form, since the ones we have at school are not the easiest to read.

Backing up this disk was not essential since it only cost $19.95, but a challenge is a challenge.

COPYA had no problems copying both sides of the Grid Master original. Of course, it would not work. Booting the copy up gives you some gibberish about 'This is a non-executable disk'.

When a protected disk can be copied with *COPYA* but the resulting copy doesn't work, the protection scheme is either a nibble-count or a signature-check. After putting the originals away, I went to the task of finding the signature-check/nibble-count code.

Copy II Plus' sector-editor is invaluable for this kind of work as it has a disk-searcher built into the sector-editor.

I went searching the disk for the byte sequence AD E9 C0 (LDA $C0E9). Why did I look for that byte sequence? Two reasons:

1) The disk is in Pascal (you can determine this by watching it boot) and Pascal disks generally use direct addressing (LDA $C0E9 as opposed to LDA $C089,X where the X-register contains $60).

2) $C0E9 is the address that turns the disk drive on (for a nibble-count/signature-check perhaps?).

At track $1E, sector $07, the start of the protection code is found starting at byte $D8. It continues on into track $1E, sector $06, up to byte $3D.

Looking over this code at first, I was sure it was a signature check but wasn't sure what it was looking for. I won't go into a discussion of what this code does since I'm not sure myself.

However, it does resemble the protection code used in Intuit's *Quicken* program. In fact, the two protection schemes are almost identical!

Trying to fix it so that the correct values would be returned proved to be frustrating. I just couldn't get that approach to work.

Looking through the initialization code where the stack and zero page are set up, I hit upon an idea. Instead of turning on the drive (track $1E, sector $07, byte $E2), why not have it jump to the end of the protection code where the stack and zero page are restored (track $1E, sector $06, byte $31)?

This does in fact circumvent the protection code and the copy now functions normally. It sure does pay to remember those older softkeys!

Cookbook Method

1 Use *COPYA* to copy both sides of the *Grid Designer* disk onto the two blank sides.

2 Using your sector-editor, make the following change to the front side of the copied disk:

Trk	Sct	Byte(s)	From	To
$1E	$07	$E2-E4	AD E9 C0	18 90 4C

You're all done!

Doug Walkey

Softkey for...

Fooblitzky
Infocom

■ Requirements

- ☐ Super IOB Collection

I only wish I could take credit for this softkey. Credit, however, belongs to your SUPER IOB Collection! For the whopping sum of $16 this is the best buy I've made since *Copy II Plus*!

Fooblitzky is an entertaining little game that appeals to just about everybody. The game is a treasure hunt, and the computer plays impartial referee.

There is quite a bit of disk activity and the disk protection eluded all of my favored copy techniques.

Enter the Super IOB Collection. No *Fooblitzky* controller, but Super Controller works like a gem! Take a clean blank disk and format it before the copy. That's it!

M.M. McFadden

Softkey for...

Strategic Simulation Inc (SSI)

RDOS disks

M.M. McFadden's well-written softkey is presented in three parts (but all three in this issue). There are two BASIC programs and several machine language programs (source code available on the library disk). RDEXed

Part I...

ProDOS RDOS

■ **Requirements**

☐ ProDOS

A few years back, the folks over at Strategic Simulations, Inc. came up with a modified DOS called RDOS. It used DOS 3.2 and had a double boot loader so that it would work on DOS 3.2 and 3.3 compatible drives.

A little while later, a COMPUTIST reader named Krakowicz came up with RDOS 3.3, a version of RDOS that would work with DOS 3.3 disks instead of the older DOS 3.2. A modified version of *COPYA*, called *COPYB*, made the transfer easier.

The files, however, were still trapped under the old RDOS format. Since RDOS only uses the memory from $B100—$BFFF, whereas DOS uses everything from $9600 up, a program copied from RDOS to standard DOS wouldn't have enough memory to work.

One solution was to use a DOS that resided in the RAM card. But RDOS doesn't use normal commands; it works completely with ampersand (&) commands from Applesoft BASIC. The commands can be changed within the program, but other problems arise.

DOS 3.3 uses the output hooks ($36—37) to intercept commands (PRINT CTRL-D). Since RDOS doesn't use them, DOS is often disconnected, leaving commands ignored.

Other problems arise when transferring programs. It isn't possible to transfer a large Applesoft file to DOS 3.3 without considerable difficulty. Any transfer program would have to run in machine language, and would have to be careful since the DOS save and load commands tend to wrench things around.

Then, a few years back, Apple introduced ProDOS. Although BASIC takes up the same amount of space, ProDOS runs almost entirely in the upper 16K of memory. Applesoft files can be BSAVED by using the T parameter. But one problem remained: what to do about the ampersand interface used by RDOS?

RDOS 2.1

Under the Microscope

To solve this problem, the only thing required was someone crazy enough to tear apart RDOS and re-write it under ProDOS. So, one fine morning I donned my straight jacket and went to work.

Eight hours later, I had torn apart the RDOS code (thanks to the method given in ***Enhancing Your Apple II*** by Don Lancaster and ***What's Where in the Apple II*** by William F. Luebbert). Here is a general description of what I found:

Memory Map:

$B100—B2FF	file buffers
$B300—B679	code for RDOS commands
$B67A—B9FF	RDOS subroutines, error messages, etc.
$BA00—BFFF	DOS 3.2 RWTS (almost unchanged)

The ampersand interpreter begins at $B303. There are 17 commands available:

Ampersand Commands

&CAT catalogs a disk. The actual code is read from block 25 (track 1, sector 12) of the RDOS disk.

&LOAD *"filename" (,addr)* loads a BASIC program. You may specify a different load location (formerly POKE 103, *lo*: POKE 104, *hi*) for it.

&RUN *"filename" (,addr)* executes a BASIC program.

&GOTO *"filename" (,addr)* 'chains' programs. Variables are saved, the new program is loaded, variables are restored, and the program is executed.

&SAVE *"filename"* saves the current BASIC program.

&STORE *"filename, addr, len* BSAVES a file. The DOS 3.3 command:

BSAVE SPUDS, A$300, L$200

...would be:

&STORE"SPUDS", 768, 512.

&RECALL *"filename" (,addr)* BLOADS a file.

&DEF *"filename", size* creates a text file *size* blocks long. Because RDOS uses a contiguous file system (like UCSD Pascal), it is necessary to determine the size of the file before it is written.

&PRINT *"filename"* writes (appends) a text file.

&READ *"filename"* reads a text file.

&END terminates reading or writing of text file by printing ASCII character $00 (nul).

&DEL *"filename"* deletes a file.

&LEN prints the start location and size of the BASIC program in memory, and prints the current LOMEN value.

&D#, *next command* changes the drive number. Must be used in conjuction with another command (i.e., &D2, CAT)

&S#, *next command* changes the slot number. See above.

&NEW erase the current program, reset HIMEM, and coldstart BASIC (like DOS 3.3 **FP**).

&USR *addr* If a command is not intercepted by RDOS, it is passed on to the routine at ADDR. Do not use a comma.

Filenames, addresses, and slot/drive numbers can be variables. It is perfectly legal to write statments like:

```
150 &RECALL "SEGMENT" + STR$(SG) + "A", LOC + 5
```

PDOS:

RDOS under ProDOS

The problem at hand was to duplicate RDOS using ProDOS MLI calls instead of the RWTS routine. This effort took four days and required 1340 lines of code (special thanks go to ***Beneath Apple ProDOS*** by Don Worth and Pieter Lechner).

The result is an RDOS work-a-like which is compatible with RDOS files and 100% compatible with standard ProDOS file types. After conversion, RDOS files can be loaded with *BASIC.SYSTEM*, and ProDOS BASIC files can be loaded with RDOS.

Some minor problems had to be taken care of, and were resolved thus:

A 1024 byte file buffer was required. This was put at $BB00—BEFF, where the RWTS routines used to be.

Text files under RDOS are never really 'open'; they are read or written as long as the input/output hooks ($36—39) point to the text file routines (this is why the **&DEF** command is necessary; the **&READ** and **&PRINT** commands assume that a text file is there). Technically speaking, you could 'close' a file with **PR#0:IN#0**. To be certain that files are not just left hanging, a generic **CLOSE** call is made every time an ampersand command is accepted.

The **&DEF** command is still required to create text files, but pre-sizing is not allowed under ProDOS. The size parameter is simply ignored.

While RDOS is device-oriented (slots & drives), ProDOS is volume-oriented (prefixes & volume names). Code was added to ensure that a prefix would be set, and the slot/drive change commands were drastically altered. Whenever a slot or drive is changed, a ProDOS MLI ONLINE call is made to find out the prefix of the destination drive.

To take advantage of prefixes, a new command similar to *BASIC.SYSTEM*'s **PREFIX** command has been added: **&P***"pathname"*

To allow easy exits from RDOS, **&STOP** will call the ProDOS QUIT code.

While RDOS catalog sectors are only 256 bytes, ProDOS directory blocks are 512 bytes. This meant the entire buffer space from $B1ØØ—B2FF would have to be used, half of which was formerly occupied by the disk catalog code. The catalog code had to be part of the main program, not read in from disk.

Even though I had an extra page ($BAØØ—BAFF) of memory, the catalog code took up twice as much room as the original. The BASIC chaining code had to go somewhere, and is now kept in a file called *CHAINSTUFF*.

RDOS filenames use DOS 3.3 syntax, and may be 24 characters long. ProDOS only allows numbers, letters, and a period, and has a 15 character maximum. The filename interpreter automatically converts illegal characters to a period. Unfortunately, there wasn't enough space to add a length checker (I had exactly one byte left).

To compensate for the lack of a filename truncator, I wrote an Applesoft program that will patch PDOS by overwriting the **&LEN** command. The program, *PDOS.FIXLEN*, will modify the *PDOS.SYSTEM* file. To modify PDOS while it is running, delete lines 11Ø and 14Ø, and remove the word **REM** in line 1ØØ.

Entering and Using PDOS

1 Type in PDOS.SYSTEM hexdump at $2ØØØ and:

```
CREATE PDOS.SYSTEM, TSYS
BSAVE PDOS.SYSTEM, A$2000, L$8AE, TSYS
```

2 Type in *CHAINSTUFF* hexdump at $1ØØØ and:

```
BSAVE CHAINSTUFF, A$1000, L$CD
```

3 Type in the *PDOS.FIXLEN* BASIC listing and:

```
SAVE PDOS.FIXLEN
```

To use *PDOS*, execute it as you would any other system program. After running, it will try to execute the BASIC commands in a text file called *SYSTEMBOOT* (this is the standard SSI method). If it isn't found, a message will be displayed telling you so.

The ideal situation is a disk with *ProDOS*, *PDOS*, and *CHAINSTUFF* as the first three files, followed by the program files. If the files must be kept in a subdirectory, put *PDOS* and *SYSTEMBOOT* in the volume directory and *CHAINSTUFF* in the subdirectory. Put a *HELLO* program in the volume directory that changes the prefix (**&P**"...") and **&RUN**s the true *HELLO* program.

PDOS.SYSTEM hexdump

```
2000: A9 B0 85 FA A9 20 85 FB   $712C
2008: A0 00 84 FC A9 B3 85 FD   $9BAF
2010: A2 08 B1 FA 91 FC C8 D0   $FE44
2018: F9 E6 FB E6 FD CA D0 F2   $17BB
2020: A2 17 A9 C1 9D 58 BF CA   $0174
2028: A9 1F 9D 58 BF CA A9 00   $3548
2030: 9D 58 BF CA 10 FA A9 00   $EA7F
2038: 8D 58 BF AD 82 C0 AD 10   $1192
2040: C0 A9 03 8D F2 03 A9 E0   $BC93
2048: 8D F3 03 20 6F FB 20 00   $76C8

2050: B3 A0 00 B9 8E 20 F0 06   $87B6
2058: 99 2C 05 C8 D0 F5 AD 30   $52F1
2060: BF 8D B8 B9 AD 9A BF D0   $8233
2068: 03 20 11 B8 A2 03 B5 36   $EFCA
2070: 9D C3 B9 CA 10 F8 A9 81   $BB81
2078: A0 20 85 38 84 39 4C A8   $FA5A
2080: B6 A2 03 BD C3 B9 95 36   $25AF
2088: CA 10 F8 4C AE B5 D0 F2   $6490
2090: EF C4 CF D3 A0 D2 C4 CF   $0C03
2098: D3 A0 F6 B1 AE B0 A0 E2   $9205

20A0: F9 A0 CD AE CD AE A0 CD   $978E
20A8: E3 C6 E1 E4 E4 E5 EE 00   $5485
20B0: 4C 5A B9 A0 00 D9 7F B9   $D1E8
20B8: F0 08 C8 C0 13 D0 F6 4C   $B351
20C0: 58 FF 98 0A A8 B9 93 B9   $AFF4
20C8: 48 B9 92 B9 48 20 80 B8   $9270
20D0: 4C B1 00 C9 C5 F0 03 4C   $B19E
20D8: FB B8 20 00 BF C7 F0 B9   $7BAF
20E0: AD BE BA D0 05 4C 07 B9   $8683
20E8: A0 00 B9 10 BA 20 5C DB   $2C7F

20F0: C8 C0 24 90 F5 20 00 BF   $6F79
20F8: C8 F3 B9 AD F8 B9 8D FA   $E2D7
2100: B9 8D 0C BA A9 00 8D FB   $98D2
2108: B9 A9 B1 8D FC B9 A9 00   $73F1
2110: 8D FD B9 A9 02 8D FE B9   $EDDB
2118: 20 00 BF CA F9 B9 90 03   $009B
2120: 4C C1 B8 A9 14 8D C1 B9   $5A4C
2128: AD 25 B1 85 FF AD 23 B1   $1E00
2130: 8D B9 B9 AD 24 B1 85 FE   $C7F4
2138: 8D BA B9 A9 04 85 FA A9   $4D3F

2140: B1 85 FB 20 B0 B3 20 E3   $7DAF
2148: B3 CE C1 B9 D0 08 20 0C   $BF5A
2150: FD A9 14 8D C1 B9 C6 FF   $2E6D
2158: D0 E9 20 80 B8 4C B1 00   $0164
2160: C6 FE F0 15 A5 FA 18 6D   $7023
2168: B9 B9 85 FA A5 FB 69 00   $1EC3
2170: 85 FB A0 00 B1 FA F0 E8   $35C5
2178: 60 20 00 BF CA F9 B9 90   $24C9
2180: 03 4C C1 B8 A9 04 85 FA   $A160
2188: A9 B1 85 FB AD BA B9 85   $9EAC

2190: FE D0 DF A0 10 B1 FA C9   $41DB
2198: 04 F0 12 C9 06 F0 11 C9   $ABA8
21A0: 0F F0 10 C9 FC F0 0F C9   $4F2E
21A8: FF F0 0E D0 0F A9 D4 2C   $FFB8
21B0: A9 C2 2C A9 C4 2C A9 C1   $ADEF
21B8: 2C A9 D3 2C A9 BF 20 5C   $D02A
21C0: DB 20 57 DB A0 13 B1 FA   $268A
21C8: AA C8 B1 FA A8 D0 12 A9   $A3DC
21D0: B0 E0 0A B0 03 20 5C DB   $FE92
21D8: E0 64 B0 03 20 5C DB A9   $5394

21E0: 00 20 24 ED 20 57 DB A0   $5E68
21E8: 00 B1 FA 29 0F 85 FC E6   $29BE
21F0: FC C8 B1 FA 09 80 20 ED   $A6B5
21F8: FD C8 C4 FC 90 F4 A9 1E   $8646
2200: 85 24 A0 15 B1 FA AA C8   $84ED
2208: B1 FA 20 24 ED 4C FB DA   $4F06
2210: 20 F0 B6 4C 03 E0 20 F0   $F573
2218: B6 4C 66 D5 AC B3 BA 8C   $0A5A
2220: BE BA B9 B4 BA 99 BF BA   $88FC
2228: 88 10 F7 A9 00 8D BB B9   $BFC0

2230: A9 B1 8D BC B9 20 46 B8   $C1DB
2238: 20 00 B1 A0 07 B9 69 00   $6FC4
2240: 99 C3 B9 88 10 F7 20 F0   $E1F2
2248: B6 A5 6A CD C4 B9 90 0C   $BC76
2250: A5 69 CD C3 B9 90 05 F0   $5085
2258: 03 4C FB B8 A0 07 B9 C3   $1674
2260: B9 99 69 00 88 10 F7 20   $0CD9
2268: 97 D6 4C D2 D7 20 74 B7   $D930
2270: A5 67 A4 68 8D BB B9 8C   $C9A1
2278: BC B9 38 A5 AF E5 67 8D   $4D61

2280: 05 BA A5 B0 E5 68 8D 06   $F79B
2288: BA A9 FC 4C 87 B8 20 74   $7A14
2290: B7 B0 03 4C FB B8 A5 50   $F7F8
2298: 8D BB B9 A5 51 8D BC B9   $55A0
22A0: 20 CB B7 A5 50 8D 05 BA   $F3C2
22A8: A5 51 8D 06 BA A9 06 4C   $DD91
22B0: 87 B8 20 74 B7 08 A9 06   $753D
22B8: 20 D8 B7 28 90 0A A5 50   $DC9A
22C0: A4 51 8D BB B9 8C BC B9   $7FC3
22C8: 4C 46 B8 20 74 B7 B0 03   $A15C

22D0: 4C FB B8 A9 04 8D CF B9   $1878
22D8: A9 00 8D D0 B9 A9 B1 8D   $AEAC
22E0: D1 B9 20 00 BF 82 00 00   $341B
22E8: 20 00 BF C0 CB B9 90 03   $4E52
22F0: 4C C1 B8 60 20 74 B7 20   $D08D
22F8: 44 B9 A9 04 20 D8 B7 20   $D44F
2300: 00 BF C8 F3 B9 AD F8 B9   $4232
2308: 8D 02 BA A9 00 8D 03 BA   $3CC6
2310: A9 B1 8D 04 BA 20 00 BF   $3F19

2318: D1 0B BA 20 00 BF CE 0B   $D68F
2320: BA A9 82 85 36 A9 B5 85   $3DE0
2328: 37 A9 A2 85 38 A9 B5 85   $7B76
2330: 39 60 48 29 7F 8D 00 B1   $314A
2338: 98 48 8A 48 A9 01 8D 05   $6078
2340: BA A9 00 8D 06 BA 20 00   $2269
2348: BF CB 01 BA 68 AA 68 A8   $444E
2350: 68 60 48 20 80 B8 20 4F   $8BAD
2358: B9 68 60 20 74 B7 20 44   $CC4F
2360: B9 A9 04 20 D8 B7 20 00   $D279
2368: BF C8 F3 B9 AD F8 B9 8D   $9EB9
```

```
2370: FA B9 A9 00 8D FB B9 A9   $A839
2378: B1 8D FC B9 A9 DD 85 38   $DB0C
2380: A9 B5 85 39 A9 10 85 36   $7123
2388: A9 B6 85 37 60 A9 A0 91   $E259
2390: 28 A9 01 8D FD B9 A9 00   $31EE
2398: 8D FE B9 20 00 BF CA F9   $ACFA
23A0: B9 90 09 20 A2 B5 20 DA   $6C7B
23A8: FD 4C FB B8 AD 00 B1 D0   $C953
23B0: 0C 20 A2 B5 20 DA FD 20   $039F
23B8: DD FB 4C 04 B9 09 80 60   $4F54

23C0: C9 00 D0 06 20 A2 B5 4C   $F12C
23C8: 4F B9 60 A9 00 4C ED FD   $8B02
23D0: 20 74 B7 20 00 BF C1 D7   $0A20
23D8: B9 90 03 4C C1 B8 60 A0   $9149
23E0: 00 A2 67 20 54 B6 A0 07   $ED9F
23E8: A2 50 38 A5 AF E5 67 85   $4FAD
23F0: 50 A5 B0 E5 68 85 51 20   $74E6
23F8: 54 B6 A2 69 A0 0F 20 54   $6B90
2400: B6 4C FB DA B9 34 BA F0   $6845
2408: 06 20 5C DB C8 D0 F5 B5   $6B1F

2410: 01 A8 B5 00 AA 98 20 24   $06ED
2418: ED 4C 57 DB A2 03 20 FE   $C018
2420: B7 CA AD B8 B9 29 70 8D   $533C
2428: B8 B9 8A 18 6A 6A 0D B8   $1E0C
2430: B9 8D B8 B9 20 11 B8 20   $9BC7
2438: BE DE 4C 03 B3 A2 08 20   $6C79
2440: FE B7 AD B8 B9 29 80 8D   $92D0
2448: B8 B9 8A 0A 0A 0A 0A 0D   $7530
2450: B8 B9 8D B8 B9 4C 84 B6   $3C3F
2458: 20 44 B9 A9 B6 A0 B6 85   $5AD0

2460: 38 84 39 4C 00 E0 91 28   $1674
2468: A9 00 A0 B1 85 73 84 74   $0601
2470: 20 4F B9 20 4B D6 4C 03   $353E
2478: E0 20 CE B7 8C 0F B3 8D   $F0B3
2480: 0F B3 60 20 74 B7 20 00   $79CC
2488: BF C6 F0 B9 90 03 4C C1   $89B1
2490: B8 60 20 00 BF 65 E9 B6   $0BC6
2498: 00 04 00 00 00 00 00 00   $7B04
24A0: A5 67 A4 68 85 50 84 51   $8B05
24A8: 20 74 B7 A9 FC 20 D8 B7   $D223

24B0: A5 50 38 ED BB B9 85 5E   $673D
24B8: A5 51 ED BC B9 85 5F A5   $79A9
24C0: 50 A4 51 8D BB B9 8C BC   $A469
24C8: B9 C0 08 B0 03 4C FB B8   $92AC
24D0: 46 D8 20 46 B8 18 A5 50   $13AE
24D8: 85 67 6D 0D BA 85 69 A5   $D2AA
24E0: 51 85 68 6D 0E BA 85 6A   $67D4
24E8: A9 00 A0 FF C6 68 91 67   $6AC0
24F0: E6 68 A5 36 A4 37 8D BD   $4934
24F8: B9 8C BE B9 A9 5F A0 B7   $5176

2500: 85 36 84 37 68 8D C1 B9   $8846
2508: 68 8D C2 B9 4C F2 D4 AD   $480B
2510: C2 B9 48 AD C1 B9 48 AD   $21DE
2518: BD B9 AC BE B9 85 36 84   $74B7
2520: 37 4C 6C D6 A9 55 85 52   $3C42
2528: 20 7B DD 20 6C DD A0 02   $D8F1
2530: B1 A0 99 55 00 88 10 F8   $DFBF
2538: C8 B1 56 29 7F C9 60 90   $82EC
2540: 03 38 E9 20 C9 20 B0 03   $C2C8
2548: 4C 99 E1 C9 2F B0 02 90   $9C60

2550: 0E C9 3A 90 0C C9 41 B0   $EE4B
2558: 02 90 04 C9 5B 90 02 A9   $0DD8
2560: AE 99 BF BA C8 C0 3F F0   $59C3
2568: 09 C4 55 90 CC A5 55 8D   $73F2
2570: BE BA 20 B7 00 C9 2C F0   $2492
2578: 02 D0 0B 20 BE DE 20 67   $BE8D
2580: DD 20 52 E7 38 24 18 60   $DA3B
2588: 8D C1 B9 20 00 BF C4 DE   $5AAF
2590: B9 90 03 4C C1 B8 AD E2   $FF1A
2598: B9 CD C1 B9 F0 03 4C 0A   $4CF0

25A0: B9 AD E3 B9 8D BB B9 AD   $B7F7
25A8: E4 B9 8D BC B9 60 8E C1   $021D
25B0: B9 20 F8 E6 E0 01 90 06   $DF2A
25B8: EC C1 B9 B0 01 60 4C 99   $89A8
25C0: E1 AD B8 B9 8D DB B9 20   $1CF6
25C8: 00 BF C5 DA B9 90 0B C9   $E921
25D0: 28 F0 22 C9 27 F0 1E 4C   $298A
25D8: C1 B8 AD BF BA 29 0F 8D   $0EA2
25E0: BE BA EE BE BA A9 2F 8D   $8015
25E8: BF BA 20 00 BF C6 F0 B9   $9D87

25F0: 90 03 4C C1 B8 60 20 00   $BB90
25F8: BF C8 F3 B9 B0 2D AD F8   $7B9B
2600: B9 8D FA B9 8D 0C BA 20   $0981
2608: 00 BF D1 0B BA AD 0D BA   $1724
2610: 8D FD B9 AD 0E BA 8D FE   $3621
2618: B9 AD BB B9 8D FB B9 AD   $810E
2620: BC B9 8D FC B9 20 00 BF   $DD85
2628: CA F9 B9 90 03 4C C1 B8   $B0E0
2630: 20 00 BF CC 09 BA 60 8D   $281F
2638: CF B9 AD BB B9 8D D0 B9   $15FD

2640: 8D 03 BA AD BC B9 8D D1   $6888
2648: B9 8D 04 BA 20 00 BF C0   $AC3F
2650: CB B9 90 03 4C C1 B8 20   $6097
2658: 00 BF C8 F3 B9 90 03 4C   $3D8F
2660: C1 B8 AD F8 B9 8D 02 BA   $4F21
2668: 20 00 BF CB 01 BA 4C 7B   $F84E
2670: B8 48 20 80 B8 68 C9 2B   $E5F2
2678: F0 43 C9 40 F0 2D C9 44   $851B
2680: F0 26 C9 45 F0 22 C9 46   $5AA8
2688: F0 1E C9 47 F0 20 C9 48   $11A0

2690: F0 1F C9 49 F0 1B C9 4C   $7C88
2698: F0 1A C9 4D F0 16 C9 55   $B81A
26A0: F0 0F C9 57 F0 08 D0 0F   $CBCE
26A8: A2 01 2C A2 02 2C A2 03   $2C80
26B0: 2C A2 04 2C A2 05 2C A2   $2816
26B8: 06 2C A2 07 2C A2 08 24   $BF8A
26C0: D8 10 03 4C 12 D4 20 FB   $9A9C
26C8: DA A0 FF C8 B9 4A BA 10   $97D5
26D0: FA CA D0 F7 20 5A DB C8   $8AE9
26D8: B9 4A BA 08 20 5C DB 28   $20CA

26E0: 30 03 4C 27 B9 A5 76 C9   $939D
26E8: FF F0 03 20 19 ED 20 DD   $B344
26F0: FB 4C 03 E0 A2 03 B5 36   $B335
26F8: 9D BD B9 CA 10 F8 60 A2   $F299
2700: 03 BD BD B9 95 36 CA 10   $90E9
2708: F8 60 20 89 FE 20 93 FE   $C371
2710: 20 58 FC A9 4C 8D F5 03   $F8A5
2718: A9 03 8D F6 03 A9 B3 8D   $A517
2720: F7 03 A9 00 85 73 A9 B1   $4183
2728: 85 74 A9 00 85 F2 60 43   $DC4C

2730: B6 AC AB B7 A8 A7 B8 BA   $DC72
2738: 87 80 85 E3 44 53 BF D5   $0B75
2740: 50 B3 22 B3 5F B4 65 B4   $B399
2748: 6B B4 BC B4 DD B4 01 B5   $F590
2750: 1A B5 43 B5 AA B5 1A B6   $90FC
2758: 1F B6 2E B6 6B B6 8C B6   $57C2
2760: A7 B6 C8 B6 D2 B6 E1 B6   $3712
2768: 60 00 00 FB C0 FB C0 C0   $D548
2770: 80 FB FB B2 A0 AA FF A0   $904B
2778: E2 8C A0 07 BE BA C3 00   $CE98

2780: 00 00 01 00 00 00 00 01   $8D0D
2788: BE BA 02 60 BF BA 0A BE   $DF03
2790: BA 00 00 FB FB 00 80 C0   $3CAF
2798: A0 A0 FE A0 A0 DE A0 A0   $1B62
27A0: 01 BE BA 03 BE BA 00 BB   $11F7
27A8: 00 04 00 00 B1 A0 C9 80   $8739
27B0: 80 04 00 00 B1 FF A0 A5   $0F7D
27B8: A0 01 00 02 00 80 A0 00   $8CBA
27C0: A0 A0 CC C5 CE A0 A0 A0   $B0DC
27C8: A0 A0 A0 A0 A0 A0 AD BC   $309F

27D0: CE C1 CD C5 BE AD A0 A0   $D5B2
27D8: A0 A0 A0 A0 A0 CC C5 CE   $63AE
27E0: C7 D4 C8 8D D3 D4 C1 D2   $C88C
27E8: D4 BA 00 CC C5 CE C7 D4   $4D5C
27F0: C8 BA 00 CC CF CD C5 CD   $E62D
27F8: BA 00 80 46 49 4C 45 20   $69EC
2800: 4E 4F 54 20 46 4F 55 4E   $B90E
2808: C4 44 4F 53 20 53 59 4E   $B4B3
2810: 54 41 58 20 45 52 52 4F   $EB24
2818: D2 44 55 50 4C 49 43 41   $470A

2820: 54 45 20 45 4E 54 52 D9   $622C
2828: 44 49 53 4B 20 46 55 4C   $B178
2830: CC 4F 55 54 20 4F 46 20   $6881
2838: 44 41 54 C1 49 2F 4F 20   $BC1C
2840: 45 52 52 4F D2 46 49 4C   $034D
2848: 45 20 54 59 50 45 20 45   $BEB6
2850: 52 52 4F D2 57 52 49 54   $757A
2858: 45 20 50 52 4F 54 45 43   $C50D
2860: 54 45 C4 0A C3 C8 C1 C9   $9024
2868: CE D3 D4 D5 C6 C6 0A D3   $5815

2870: D9 D3 D4 C5 CD C2 CF CF   $D6E1
2878: D4 80 A0 A0 FF A0 A0 FF   $1873
2880: A0 A0 80 A0 A0 FF A0 A0   $F5B2
2888: FF A0 A0 80 A0 A0 B2 A0   $F781
2890: A0 FF A0 A0 80 A0 A0 C5   $A35E
2898: A0 A0 A5 A0 A0 D9 A0 A0   $B6A1
28A0: A5 A0 A0 E0 A0 A0 C4 A0   $CEE4
28A8: A0 80 A0 A0 FF A0         $0737
```

CHAINSTUFF hexdump

```
1000: 20 84 E4 A9 07 85 8F A5   $2192
1008: 69 A6 6A 85 9D 86 9E E4   $E03E
1010: 6C D0 04 C5 6B F0 05 20   $5410
1018: 71 B1 F0 F3 85 9F 86 A0   $B2FC
1020: A9 03 85 8F A5 9F A6 A0   $1CFE
1028: E4 6E D0 05 C5 6D D0 01   $89C2
1030: 60 85 9D 86 9E A0 00 B1   $6024
1038: 9D AA C8 B1 9D 08 C8 B1   $3479
1040: 9D 65 9F 85 9F C8 B1 9D   $8B37
1048: 65 A0 85 A0 28 10 D5 8A   $07DF
```

```
1050: 30 D2 C8 B1 9D A0 00 0A   $BA4E
1058: 69 05 65 9D 85 9D 90 02   $BBA0
1060: E6 9E A6 9E E4 A0 D0 04   $C3C8
1068: C5 9F F0 BC 20 7B B1 F0   $5370
1070: F3 B1 9D 30 46 C8 B1 9D   $FF79
1078: 10 41 C8 B1 9D F0 3C C8   $E766
1080: B1 9D AA C8 B1 9D 85 9C   $429F
1088: 86 9B C5 B0 F0 02 B0 2B   $5399
1090: 88 88 B1 9D 48 38 A5 6F   $F728
1098: 85 94 F1 9D C8 91 9D 85   $B6FD

10A0: 6F C8 A5 70 85 95 E9 00   $E0AD
10A8: 91 9D 85 70 68 18 65 9B   $6E5D
10B0: 85 96 A5 9C 69 00 85 97   $93AB
10B8: 20 9A D3 A5 8F 18 65 9D   $3F79
10C0: 85 9D 90 02 E6 9E A5 9D   $24F1
10C8: A6 9E A0 00 60            $488B
```

PDOS.FIXLEN

```
10 REM THIS REPLACES THE RDOS &LEN COMMAND
20 REM WITH A FILENAME TRUNCATOR
100 SU=9183: JM=9586: REM SU=46639: JM=47042
110 PRINT CHR$ (4) "BLOAD*PDOS.SYSTEM, A$2000,
    TSYS"
120 FOR A = SU TO SU + 45: READ B: POKE A,B: NEXT
130 POKE JM,32: POKE JM + 1,48: POKE JM + 2,182
140 PRINT CHR$ (4) "BSAVE*PDOS.SYSTEM,
    A$2000,TSYS" : END
150 DATA 96,169,0,133,80,172,190,186,185,
    190,186,201,47,240,8,136,208,246,173,
    190,186
160 DATA 208,8,132,80,173,190,186,56,229,
    80,201,16,144,8,169,15,24,101,80,141,
    190,186,76,183,0
```

Checksums

```
10  - $BADD     130 - $FFFF
20  - $9B13     140 - $E450
100 - $D11C     150 - $B6AE
110 - $FF7E     160 - $A127
120 - $D613
```

Part II...

RDOS Transfer Utility

■ **Requirements**

- ☐ PDOS
- ☐ Old System Master
- ☐ ProDOS

The modified DOS called RDOS created by the folks over at Strategic Simulations, Inc. (SSI) can be found on about four dozen of SSI's products. Because it is a very terse, limited operating system, file examination and modification can be difficult. It would be much easier to edit the files under ProDOS...

How RDOS *TRANSFER* Works

Files under RDOS are stored in sequential blocks (256 byte, not ProDOS 512 byte blocks); the catalog entry contains the first block and the number of blocks in the file. This is similar to Apple's UCSD Pascal operating system.

Each entry in the catalog is 32 bytes long, and has the following format:

0-23	The filename, padded with trailing spaces
24	File type: ASCII **A**, **B**, or **T**
25	Number of blocks used by this file
26-27	Load location (lo-hi format)
28-29	File length (lo-hi format)
30-31	First block (lo-hi format)

The first file on every disk is *RDOS 2.1 COPYRIGHT 1981*. This occupies the first 26 blocks (tracks 0 and 1 of a 13-sector disk), and includes the catalog and *RDOS* itself. The catalog occupies track 1, sectors 0—10. Sector 12 contains the code that actually catalogs the disk, and sector 11 contains information used to chain Applesoft programs.

Since files are contiguous, a deleted file is marked as unused space. The first byte of the name is set to $80, and the type is set to $A0 (a blank space).

TRANSFER starts by reading the entire catalog into a buffer from SE00—$18FF (line 140). This is immediately after the program and immediately before the RWTS.

Line 150 sets the current entry pointer (CE) to the second entry in the catalog (no need to transfer over the DOS and disk catalog). Line 155 looks for a blank entry, and if it finds one, it skips it.

Line 160 calls the subroutine at 1000, which gets the file information:

N$	'Raw' filename
NAME$	ProDOS-compatible file name
T$	Type
BL	Number of blocks
LD	Load location
LN	File length
SB	Start block

If there are no more entries, the program ends at line 300. Line 170 prints information about the current file, and line 175 prints the old file name if it doesn't match the new one.

Line 180 is the heart of the program: it translates the block numbers into tracks and sectors, and reads in the entire file. The call to RW is a short machine language routine (in *TRANSUBS*) which calls the RWTS routine.

Lines 200—220 call another part of *TRANSUBS* which creates the files. It was necessary to use a special program because it is impossible to set the AUX-TYPE bytes from *BASIC.SYSTEM* for BASIC programs.

The AUX-TYPE holds the load location, and is used by *BASIC.SYSTEM* when altering certain absolute pointers in Applesoft programs. Although *RDOS* would be able to read the files without difficulty if these bytes weren't set, *BASIC.SYSTEM* would be unable to.

Line 230 saves the file to disk. Because most of memory is needed to copy files, line 235 cleans up the variables after each pass. Line 240 moves the pointer to the next file, and loops back.

Entering *TRANSFER*

1 Type in the *TRANSFER* program (under ProDOS), and:

```
SAVE TRANSFER
```

2 Next, enter the *TRANSUBS* program and:

```
BSAVE TRANSUBS, A$300, L$9D
```

3 Now you must get an old DOS RWTS routine.

3a **For DOS 3.2...**

If you intend to transfer DOS 3.2 programs, break out the old *MUFFIN* program on the system master. You need to:

```
BLOAD MUFFIN
BSAVE RDOS3.2, A$1900, L$800
```

This should be transferred to the ProDOS directory with *TRANSFER* using *CONVERT* or *Copy II Plus*.

3b **For RDOS 3.3...**

If you want to convert programs cracked with RDOS 3.3 (courtesy Krakowicz, COMPUTIST #30), boot your system master, and allow it to load integer BASIC. Then relocate RWTS as follows:

```
INT
CALL-151
D4D5G                          (Initialize the relocator)
1900<B800.BFFF□Y *             (Define source block)
1900<B800.BA10□Y               (Relocate some code)
.BC55M                         (Move some stuff)
.BFA7□Y
.BFC7M
.BFFF□Y
BE2A:EA EA EA EA               (Cancel sector interleaving)
BSAVE RDOS3.3, A$1900, L$800
```

Then, transfer the RWTS over to the *TRANSFER* disk.

*TRANSFER*ing Programs

To transfer files, load the *TRANSFER* program. Line 110 contains a variable V, which is set to 3.3 or 3.2 depending on the DOS version. If you are copying from an original disk, set V to 3.2. If your disk has already been cracked (RDOS 3.3), set V to 3.3.

Line 125 contains the prefix to write to. Note that it must have an ending slash.

Most SSI programs have an altered address header (D4 AA B7). If your disk is standard DOS 3.2 (D5 AA B5), delete line 127.

When copying files, I suggest that you transfer them to a newly formatted disk, into an empty subdirectory (volume directories hold only 51 filenames). High-capacity RAM disks work beautifully.

As the files are copied, information about them will be printed. If *TRANSFER* must change a filename, the old name will be printed on the line below in parenthesis.

You should write down any filenames with a slash (/) - references to these must be changed within the programs. Filenames with blank spaces or other characters which are illegal under ProDOS will be changed, and these changes are automatically recognized by PDOS.

If any of the filenames exceed 15 characters, the length truncator must be installed into PDOS.

After it finishes, you can examine the amount of space used, and get some idea of how much space will be left on the disk. If you are transferring it to a 5¼" disk, you will need room for the ProDOS image (32 blocks) and the *PDOS.SYSTEM* file (6 blocks).

You should then set up the destination disk, placing a copy of *CHAINSTUFF* in the directory. Copy the files over, and make modifications to the following:

HELLO program: *SYSTEMBOOT* changes several page 3 vectors; this changes them to something more appropriate. It changes the DOS warmstart vector ($3D0) to $B300, the RWTS vector to the monitor, and the reset vector to BASIC ($E003).

So add the following line with an appropriate line number:

POKE 977,0: POKE 978,179: POKE 986,89: POKE 987,255: POKE 1010,3: POKE 1011,224: POKE 1012,69: POKE 214,0

QWERTY (*@WERTY*, *QWERTY.4*) : determine the start address, BLOAD the program, store A9 00 85 00 60 at the very start, and BSAVE it. This removes the secondary copy protection. It should also be possible to just delete the lines in the *HELLO* program which call *QWERTY*.

*NOTE: the usual method for killing *QWERTY* will not work. *QWERTY* makes direct calls to RWTS routines which don't exist under PDOS.

SSI.INIT : this formats disks to RDOS format. Since it requires the RDOS RWTS, it won't work; and if it did, the disks couldn't be used from ProDOS. **BLOAD SSI.INIT**, store a $60 (RTS) at the program start (usually $8000), and **BSAVE SSI.INIT**.

Since you can't initialize save-game disks, make sure that you have a formatted ProDOS volume before you start. You must either use a disk with the same volume name as the program, or save games with names like */PROG/GAME*.

If you noticed that some of the original file names contained a slash, you must check the Applesoft files for the places where they are referenced. If not fixed, the errors could cause the program to crash or hang.

I have checked the following:

PDOS Softkey for...

Operation Market Garden

Runs without modification. If moved to high-capacity storage, you may want to eliminate lines 160-162 in the file *LOADER*. Make sure both sides have the same volume name.

PDOS Softkey for...

Ringside Seat

In line 11200 of *PRERSS* change **RSS.RING/TEXT** to **RSS.RING.TEXT**. Boxer data disks must have the same volume name as the boot volume. There will be only 8 free blocks after the transfer is complete.

PDOS Softkey for...

Computer Ambush

When this was re-written in machine language, it was interfaced directly with RDOS. Since it bypasses the string entry routine, filenames cannot be screened for illegalities. Take care when saving games. This program requires a few patches...

RENAME HT2, HT *(Higher Text 2)*

HELLO: change all occurences of *HT2* and *INIT.PHASE* to *HT* and *INIT.PHASE* in line 100. **HT2** had to be abbreviated to leave space in the programs for storing the length byte.

SWITCH: this is used to switch between the main programs. Do the following:

BLOAD SWITCH
CALL-151
84C:BF BA *(change filename buffer)*
854:BF BA
857:8C BE BA EA EA EA EA EA *(set name length)*
861:05 B5 *(jump to PDOS readfile routine)*
BSAVE SWITCH

OIP: (Order Input Phase) this tries to load the file *HT2* after loading.

BLOAD OIP
CALL-151
4003:BF BA *(Change filename buffer)*
4008:C0 BA
400B:02 *(Set name length to 2)*
400D:BE BA
4011:05 B5 *(Read the file)*
BSAVE OIP

RP: (Report Phase) not only does this try to load *HT2*, but it also tries to save the game.

BLOAD RP
CALL-151
4017:BF BA *(Same as OIP)*
401C0:C0 BA
401F:02
4021:BE BA
4025:05 B5

The following is necessary only to save games.

6194:14 B9 *(re-route onerr)*
6199:15 B9
641E:00 *(Change "delete" code to zero)*
6552:86 00 EA *(Store save/delete code)*
6581:BF BA *(Filename buffer)*
658D:BF BA
6595:8C BE BA A5 00 D0 03 20 23 B6 4C B5 65 A9 00 85 50 8D BB B9 A9 9C 8D BC B9 A9 14 85 51 20 F3 B4 A9 00 8D 72 63 A5 00
BSAVE RP

I actually didn't modify much, but everything had to be shifted by three bytes.

One final note: make sure that you use the original *SYSTEMBOOT* file with this and any other program that uses Higher Text 2; it calls $3EA and possibly some other page 3 vectors that are initialized by *SYSTEMBOOT*.

PDOS Softkey for...

Phantasie

Runs without modification. If moved to high-capacity storage, you only need one set of the *MNn* files.

It may be a good idea to use two subdirectories (or two disks), putting all of the scrolls, dungeon, and town data in one, and the main programs and monster files in the volume directory of the other. There are a large number of files, and ProDOS takes its own sweet time searching through large directories (while this would require modifications to the programs, it would allow two-drive play).

PDOS Softkey for...

Questron

I only took a brief look, but it appears to require several modifications. The main hitch is that the program tries to load the *DISK-n* files at $00FE - illegal under ProDOS, even if you

adjust the 'memory-in-use' map. The load address must be changed on these (see line 101 of the *HELLO* program). Note also that the filename truncator **must** be installed.

If you plan to move it to high-capacity storage, it would be nice to put each disk in its own subdirectory; replace the drive change commands with **&P** commands. Try moving disks 1 and 2 to a RAM disk, while leaving disk 0 on a floppy to keep your saved games.

Errors While Copying

Sometimes during a transfer, the program will print a two-digit hex number and fall into the monitor. The following errors are possible:

$27 - I/O ERROR. Something is wrong with the destination volume.
$2B - Write-protected.
$2E - Volume switched.
$40 - Invalid Pathname Syntax. Make sure prefix has trailing slash.
$44 - Nonexistent Path.
$47 - Duplicate File Name. Do not try to copy files into the same directory as a bunch of other RDOS files.
$48 - Disk Full. Not enough space - make sure disk is empty (no ProDOS file or other system files).
$49 - Volume Directory Full. Too many files; use subdirectory.
$52 - Not a ProDOS Disk.
$57 - Duplicate Volume Online.

Closing Notes

PDOS and *TRANSFER* allow you to put SSI programs on virtually any type of storage, from 5½" floppies to 20M (meg) hard disks.

I was able to put *Ringside Seat*, *Computer Ambush*, *Operation Market Garden*, and *Phantasie* all onto a single 3½"disk, and still had 280 blocks free - enough for a single-sided game.

I was also able to move the programs over to a 256K RAM disk. Combined with an accelerator card or IIgs fast mode, even the slowest of SSI's programs take on a new life.

TRANSFER

```
10 LOMEM: 34304: REM $8600 - NO GPLE
100 TEXT : NORMAL : HOME
110 D$ = CHR$ (4):V = 3.2
120 PRINT D$ "BLOADTRANSUBS" : PRINT D$ "BLOAD
    RDOS" V:RW = 771:IOB = 782:TR = IOB + 4:SC
    = IOB + 5:BF = IOB + 9: PRINT "RDOS^TRANSFER^
    -^BY^M.M.^MCFADDEN" : PRINT
125 P$ = "/SSI/"
127 IF V = 3.2 THEN POKE 6774,212: POKE 6795,183:
    REM MODIFIED ADDR HEADER
130 PRINT "INSERT^RDOS^DISK^AND^HIT^RETURN" ::
    CALL - 756: PRINT
140 POKE TR,1: FOR A = 0 TO 10: POKE SC,A: POKE
    BF,14 + A: CALL RW: NEXT : REM READ AT
    $E00-$18FF
150 BS = 33:CE = 3584 + 32: REM BUFFER START =
    $2100, CURRENT ENTRY = $E00 (SKIP FIRST)
155 IF PEEK (CE) = 128 OR PEEK (CE + 24) = 160 THEN
    240: REM BLANK ENTRY
160 GOSUB 1000: IF NAME$ = "" THEN 300
170 PRINT CHR$ (34)NAME$ CHR$ (34):: HTAB 41:
    PRINT "TYPE^" T$ ",^" BL "^BLOCKS,^START
    ^=^" SB
175 IF OL$ < > NAME$ THEN PRINT "(" OL$ ")"
180 T = INT (SB / 13):S = SB - T * 13:B = BS: FOR
    A = 1 TO BL: POKE TR,T: POKE SC,S: POKE BF,B:
    CALL RW:B = B + 1:S = S + 1: IF S > 12 THEN
    S = 0:T = T + 1
190 NEXT
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$
235 PRINT D$ "FRE"
240 CE = CE + 32: GOTO 155
300 PRINT "DONE!" CHR$ (7): END
999 END
1000 N$ = "" : FOR A = 0 TO 23: N = PEEK (CE + A):
    IF N < > 0 THEN N$ = N$ + CHR$ (N - 128): NEXT
1010 IF A = 0 THEN NAME$ = "" : GOTO 1060
1015 OL$ = N$
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$) > ASC ("9")) THEN A$ = "."
1040 NAME$ = NAME$ + A$: NEXT
1050 T$ = CHR$ ( PEEK (CE + 24) - 128): BL = PEEK
    (CE + 25): LD = PEEK (CE + 26) + PEEK (CE +
    27) * 256: LN = PEEK (CE + 28) + PEEK (CE
    + 29) * 256: SB = PEEK (CE + 30) + PEEK (CE
    + 31) * 256
1060 RETURN
```

Checksums

```
10   - $A92B     210  - $A7E2
100  - $F42C     220  - $C1EA
110  - $5B39     230  - $435E
120  - $7BF9     235  - $7021
125  - $AC18     240  - $B9A3
127  - $611A     300  - $527D
130  - $890A     999  - $031E
140  - $3597     1000 - $E870
150  - $FDA7     1010 - $2FF9
155  - $C74B     1015 - $5A45
160  - $06DB     1020 - $1899
170  - $E2EA     1030 - $206A
175  - $A2AC     1040 - $E522
180  - $AFCA     1050 - $A2E7
190  - $E0E5     1060 - $40E2
200  - $04C3
```

TRANSUBS hexdump

```
0300: 4C 23 03 A9 03 A0 0E 08   $57FC
0308: 78 20 00 1E 28 60 01 60   $030E
0310: 01 00 01 00 1F 03 00 20   $B7C0
0318: 00 00 01 00 00 60 01 00   $A7A4
0320: 01 EF D8 20 BE DE A9 55   $3270
0328: 85 52 20 7B DD 20 6C DD   $22CE
0330: A0 02 B1 A0 99 55 00 88   $61EB
0338: 10 F8 C8 B1 56 99 81 02   $AAF9
0340: C8 C4 55 90 F6 A5 55 8D   $29D1
0348: 80 02 20 BE DE C9 42 F0   $A417
0350: 0A C9 54 F0 09 C9 41 F0   $F1C7
0358: 08 D0 2A A9 06 2C A9 04   $D024
0360: 2C A9 FC 8D 95 03 20 B1   $1672
0368: 00 20 BE DE 20 67 DD 20   $9E0F
0370: 52 E7 A5 50 8D 96 03 A5   $1AE4
0378: 51 8D 97 03 20 00 BF C0   $DCD0
0380: 91 03 B0 04 60 4C 79 E1   $F65F
0388: 20 DA FD 20 DD FB 4C 59   $2E75
0390: FF 07 80 02 C3 00 00 00   $4FFD
0398: 01 00 00 00 00            $B2E3
```

Part III...

Addendum

Copying the new 16-sector RDOS

To copy the new RDOS 3.3, first create a modified 3.3 RWTS.

BLOAD RDOS 3.3
CALL - 151
1F2A:A8 B9 B8 20 *use sector skewing*
20B8:00 02 04 06 08 0A 0C 0E 01 03 05 07 09 0B 0D 0F

BSAVE RDOS3,A$1900,L$800

Then modify the transfer program to use the new RWTS.

LOAD TRANSFER

Change *V=3.2* in line 110 to *V=3*
Change the numbers in line 180. (IE. Change all *12*s to *15*s and all *13*s to *16*s.)

Run it as you normally would.

That's it!

Joseph P. Karwoski

Booting The IIc External Drive

Attn: Mike Grabenstein

This is an answer to Mike Grabenstein's question in COMPUTIST #49 on how to boot the external drive on the Apple IIc.

There are two ways that I know of to boot the IIc's external drive:

1. Try **PR#7** from BASIC or
2. From BASIC, type:

```
Call -151
300:FF A9 E0 A0 01 A2 60 4C 0B C6
300G
```

The only problem is that this will ***only*** work with ProDOS disks.

Christoper Dean

Making Cracked II Plus Disks Work On The IIc

There are many programs on the market which either don't work on the IIc or their deprotected copies do not work on the IIc. I discovered several of these, including *Drol*, *Hardball*, *Ogre*, and *Artic Fox*. I have been able to fix all of these to work on the IIc.

The process is fairly simple. The programs do not work because the Boot ROM is different on the IIc and these programs need the old Boot ROM to work.

To solve this problem you must first find a safe place in memory to store a copy of the old Boot ROM. Second, you must store it in an unused sector and also find a place on the disk for the code that will load it. Finally, you change all the accesses to $C600 (Boot ROM) to wherever the old Boot ROM is stored. For most programs there will be room on track $00 for the old Boot ROM.

For example, on a program that uses a RWTS, the ROM can be stored in the sector where the buffer is ($BB00 in memory) since the data in that sector is just garbage. *Hardball* is an example of this.

However, the case may arise where you may have to put the ROM somewhere else and use a seek routine to read it. *Ogre* is an example of this.

Finally, there may not be room in memory for the ROM. In 48K programs, you will have to make them into 64K versions by setting the bank switches and storing the ROM in the upper 16K somewhere and also copying address $F800—$FFFF to the language card so the program will still run (Remember, the ROM is shut off when using the language card). *Drol* is an example of this procedure.

Fortunately, none of the 64K programs have used all of memory. The following procedures are needed to fix the programs to work on a IIc.

Drol
Broderbund

1 Tell *Drol* to jump to our routine by sector-editing.

Trk	Sct	Byte(s)	From	To
$00	$00	$EC-$EE	?	$4C 00 3C

2 Type the Boot ROM (listed at the end of this letter) into track $00, sector $05.

3 Sector-edit the following into track $00, sector $06. This sets 64K memory, copies the ROM to the language card, and copies the old boot ROM from $3B00 (RWTS buffer) to $D000 bank 1 before the second stage boot is run.

Trk	Sct	Byte(s)	From	To
$00	$06	$00	?	8D 00 C0 8D 02 C0 8D 04
		$08		C0 8D 0C C0 8D 0E C0 AD
		$10		81 C0 AD 81 C0 AD 8B C0
		$18		AD 8B C0 A2 00 BD 00 3B
		$20		9D 00 D0 E8 D0 F7 AD 83
		$28		C0 AD 83 C0 AD 81 C0 AD
		$30		81 C0 A0 08 A2 00 BD 00
		$38		F8 9D 00 F8 E8 D0 F7 EE
		$40		38 3C EE 3B 3C 88 D0 EC
		$48		AD 8B C0 AD 8B C0 4C 00
		$50		43 EA EA EA EA EA

4 Sector-edit track $00, sector $0B and track $02, sector $05 changing byte $36 from a C6 to a D0. This changes the two accesses from $C600 to $D000. That's it for fixing *Drol*.

Hardball
Accolade

1 Type in the Boot ROM into track $00, sector $02.

2 Sector-edit track $00, sector $00 starting at byte $00.

Trk	Sct	Byte(s)	From	To
$00	$00	$00		01 A5 2B 4A 4A 4A 4A 09
		$08		C0 8D 1B 08 A9 95 85 27
		$10		A9 0C 85 3D A9 60 8D 01
		$18		08 20 5C C6 4C 02 95 EA
		$20		EA EA

3 Type the following into track $00, sector $09 starting at byte $00. This will load the ROM into location $9600.

Trk	Sct	Byte(s)	From	To
$00	$09	$00	?	03 01 A5 2B 4A 4A 4A 4A
		$08		09 C0 8D 17 95 A9 0B 85
		$10		3D A9 96 85 27 20 5C C6
		$18		A9 09 85 FF A9 01 85 FE
		$20		A5 FF 85 27 A5 FE 85 3D
		$28		20 5C 96 E6 FF E6 FE A5
		$30		FE C9 10 D0 EB A0 00 84
		$38		FC 84 FE A9 08 85 FD A9
		$40		B0 85 FF A2 10 B1 FC 91
		$48		FE C8 D0 F9 E6 FD E6 FF
		$50		CA D0 F2 4C 22 B0

Ogre
Origin Systems

1 Type the Boot ROM into track $00, sector $02.

2 Type the following into track $00, sector $00. This will load the Boot ROM into $9600. Unfortunately, there is not enough room in this sector for the rest of Boot 1. It will be placed on track $22, sector $0E and sector $0F and loaded separately.

Trk	Sct	Byte(s)	From	To
$00	$00	$00	?	01 A2 00 8E 78 04 8E F4
		$08		03 A9 0B 85 3D A9 96 85
		$10		27 A9 60 8D 01 08 20 5C
		$18		C6 EA A9 22 20 32 08 A9
		$20		00 85 26 A0 0F B9 B9 08
		$28		85 3D A9 09 20 5A 96 4C
		$30		C9 08 85 41 0A 85 2A CD
		$38		78 04 F0 51 A9 00 85 26
		$40		AD 78 04 85 27 38 E5 2A
		$48		F0 33 B0 07 49 FF EE 78
		$50		04 90 05 69 FE CE 78 04
		$58		C5 26 90 02 A5 26 C9 0C
		$60		B0 01 A8 38 20 81 08 B9
		$68		A1 08 20 90 08 A5 27 18
		$70		20 84 08 B9 AD 08 20 90
		$78		08 E6 26 D0 C3 20 90 08
		$80		18 AD 78 04 29 03 2A 05
		$88		2B AA BD 80 C0 A6 2B 60
		$90		A2 11 CA D0 FD E6 46 D0
		$98		02 E6 47 38 E9 01 D0 F0
		$A0		60 01 30 28 24 20 1E 1D
		$A8		1C 1C 1C 1C 1C 70 2C 26
		$B0		22 1F 1E 1D 1C 1C 1C 1C
		$B8		1C 00 0D 0B 09 07 05 03
		$C0		01 0E 0C 0A 08 06 04 02
		$C8		0F A2 00 BD E7 09 9D 0E
		$D0		04 E8 E0 0B D0 F5 20 B4
		$D8		09 A6 2B BD 88 C0 20 00
		$E0		1C 4C F3 08 2C 50 C0 2C
		$E8		52 C0 2C 57 C0 2C 55 C0
		$F0		20 4D 09 2C 10 C0 AD 00
		$F8		C0 10 FB EA EA EA A6 2B

3 Type the following into track $22, sector $0E.

Trk	Sct	Byte(s)	From	To
$22	$0E	$00	01 38 B0 03 4C 32 A1 86	
		$08	43 C9 03 08 8A 29 70 4A	
		$10	4A 4A 4A 09 C0 85 49 A0	
		$18	FF 84 48 28 C8 B1 48 D0	
		$20	3A B0 0E A9 03 8D 00 08	
		$28	E6 3D A5 49 48 A9 5B 48	
		$30	60 85 40 85 48 A0 63 B1	
		$38	48 99 94 09 C8 C0 EB D0	
		$40	F6 A2 06 BC 1D 09 BD 24	
		$48	09 99 F2 09 BD 2B 09 20	
		$50	48 09 CA 10 EE A9 09 85	
		$58	49 A9 86 A0 00 C9 F9 B0	
		$60	2F 85 48 84 60 84 4A 84	
		$68	4C 84 4E 84 47 C8 84 42	
		$70	C8 84 46 A9 0C 85 61 85	
		$78	4B 20 12 09 B0 68 E6 61	
		$80	E6 61 E6 46 A5 46 C9 06	
		$88	90 EF AD 00 0C 0D 01 0C	
		$90	D0 6D A9 04 D0 02 A5 4A	
		$98	18 6D 23 0C A8 90 0D E6	
		$A0	4B A5 4B 4A B0 06 C9 0A	
		$A8	F0 55 A0 04 84 4A AD 02	
		$B0	09 29 0F A8 B1 4A D9 02	
		$B8	09 D0 DB 88 10 F6 29 F0	
		$C0	C9 20 D0 3B A0 10 B1 4A	
		$C8	C9 FF D0 33 C8 B1 4A 85	
		$D0	46 C8 B1 4A 85 47 A9 00	
		$D8	85 4A A0 1E 84 4B 84 61	
		$E0	C8 84 4D 20 12 09 B0 17	
		$E8	E6 61 E6 61 A4 4E E6 4E	
		$F0	B1 4A 85 46 B1 4C 85 47	
		$F8	11 4A D0 E7 4C 00 20 4C	

4 Type the following into track $22, sector $0F.

Trk	Sct	Byte(s)	From	To
$22	$0F	$00	BD 89 C0 EA EA EA EA EA	
		$08	A9 00 85 26 A0 0E B9 B9	
		$10	08 85 3D A9 08 20 5A 96	
		$18	A9 60 8D 52 96 20 3B 96	
		$20	A9 00 85 3D 85 41 2C 10	
		$28	C0 A9 E6 8D EB 96 4C EB	
		$30	96 A0 00 B9 00 20 38 E9	
		$38	9C 99 00 20 C8 D0 F4 EE	
		$40	35 09 EE 3B 09 AD 35 09	
		$48	C9 60 D0 E5 60 A2 00 BD	
		$50	00 20 9D 00 40 E8 E8 E8	
		$58	D0 F5 EE 51 09 EE 54 09	
		$60	AD 51 09 C9 40 D0 E6 60	
		$68	A2 00 A9 00 9D 00 40 E8	
		$70	E8 E8 D0 F6 EE 6E 09 AD	
		$78	6E 09 C9 60 D0 EC A9 40	
		$80	8D 6E 09 60 20 34 08 20	
		$88	A5 09 CE 01 0A AD 00 0A	
		$90	18 6D 01 0A A8 B9 B9 08	
		$98	85 3D A6 2B 20 5C 96 AD	
		$A0	01 0A D0 E3 60 A9 00 85	
		$A8	26 AD B3 09 85 27 CE B3	
		$B0	09 60 01 1C CE B2 09 AE	
		$B8	B2 09 BD D8 09 85 41 BD	
		$C0	E2 09 8D 00 0A BD DD 09	
		$C8	8D 01 0A A6 2B A5 41 20	
		$D0	84 09 AD B2 09 D0 DD 60	
		$D8	22 00 00 00 00 05 00 00	
		$E0	00 00 00 00 00 00 00 A0	
		$E8	A0 A0 A0 A0 A0 A0 A0 A0	
		$F0	A0 A0 00 B9 38 32 32 2C	
		$F8	33 3A B9 38 32 33 2C 31	

Arctic Fox

Electronic Arts

1 Type the Boot ROM into track $00, sector $05.

2 Type the following into track $00, sector $00 starting at byte $00.

Trk	Sct	Byte(s)	From	To
$00	$00	$00	01 8D FF 94 A9 60 8D 01	
		$08	08 A5 2B AA 85 FF 4A 4A	
		$10	4A 4A 09 C0 8D 2B 08 A9	
		$18	96 85 27 A9 00 85 26 A9	
		$20	00 85 41 A9 05 85 3D A6	
		$28	FF 20 5C C6 A0 00 B9 00	
		$30	08 99 00 93 C8 D0 F7 4C	
		$38	3A 93 A9 08 85 27 A9 06	
		$40	85 3D A9 00 85 41 A6 FF	
		$48	4C 5C 96 4C 59 FF	

3 Type the following into track $00, sector $0C.

Trk	Sct	Byte(s)	From	To
$00	$0C	$00	01 4C 04 08 A9 43 8D 02	
		$08	08 86 2B 8E F4 03 EA EA	
		$10	EA EA EA EA EA EA EA EA	
		$18	20 84 FE 20 2F FB 20 93	
		$20	FE 20 89 FE 20 58 FC A0	
		$28	13 C0 0D B0 08 B9 D9 08	
		$30	49 42 99 00 04 B9 E6 08	
		$38	49 42 99 38 05 88 10 E9	
		$40	C8 84 FD AD FA 08 C9 03	
		$48	D0 09 AE FC 08 CA CA CA	
		$50	8E 72 08 CD FD 08 F0 29	
		$58	0A AA BD FE 08 85 41 BD	
		$60	FF 08 AA BD C9 08 85 3D	
		$68	A5 41 20 91 08 A9 00 85	
		$70	26 A9 09 18 6D FA 08 85	
		$78	27 EE FA 08 A6 2B 4C 5C	
		$80	96 A9 00 20 91 08 A6 2B	
		$88	BD 88 C0 2C 10 C0 4C 00	
		$90	0A 0A 85 FC A5 FD 85 FE	
		$98	38 E5 FC D0 01 60 B0 04	
		$A0	E6 FD 90 02 C6 FD A5 FD	
		$A8	29 03 0A 05 2B A8 B9 81	
		$B0	C0 20 C4 08 A5 FE 29 03	
		$B8	0A 05 2B A8 B9 80 C0 20	
		$C0	C4 08 F0 D0 A9 25 4C A8	
		$C8	FC 00 0D 0B 09 07 05 03	
		$D0	01 0E 0C 0A 08 06 04 02	
		$D8	0F 8B AC B6 A7 B0 A1 A7	
		$E0	B2 B6 E2 F3 EC F0 F3 F2	
		$E8	ED F0 F3 ED FA F4 E2 E2	
		$F0	E2 E2 E2 E2 E2 E2 E2 E2	
		$F8	E2 E2 00 00 60 1D 00 0F	

BOOT ROM

Trk	Sct	Byte(s)	From	To
see		$00	A2 20 A0 00 A2 03 86 3C	
article		$08	8A 0A 24 3C F0 10 05 3C	
		$10	49 FF 29 7E B0 08 4A D0	
		$18	FB 98 9D 56 03 C8 E8 10	
		$20	E5 20 58 FF BA BD 00 01	
		$28	0A 0A 0A 0A 85 2B AA BD	
		$30	8E C0 BD 8C C0 BD 8A C0	
		$38	BD 89 C0 A0 50 BD 80 C0	
		$40	98 29 03 0A 05 2B AA BD	
		$48	81 C0 A9 56 20 A8 FC 88	
		$50	10 EB 85 26 85 3D 85 41	
		$58	A9 08 85 27 18 08 BD 8C	
		$60	C0 10 FB 49 D5 D0 F7 BD	
		$68	8C C0 10 FB C9 AA D0 F3	
		$70	EA BD 8C C0 10 FB C9 96	
		$78	F0 09 28 90 DF 49 AD F0	
		$80	25 D0 D9 A0 03 85 40 BD	
		$88	8C C0 10 FB 2A 85 3C BD	
		$90	8C C0 10 FB 25 3C 88 D0	
		$98	EC 28 C5 3D D0 BE A5 40	
		$A0	C5 41 D0 B8 B0 B7 A0 56	
		$A8	84 3C BC 8C C0 10 FB 59	
		$B0	D6 02 A4 3C 88 99 00 03	
		$B8	D0 EE 84 3C BC 8C C0 10	
		$C0	FB 59 D6 02 A4 3C 91 26	
		$C8	C8 D0 EF BC 8C C0 10 FB	
		$D0	59 D6 02 D0 87 A0 00 A2	
		$D8	56 CA 30 FB B1 26 5E 00	
		$E0	03 2A 5E 00 03 2A 91 26	
		$E8	C8 D0 EE E6 27 E6 3D A5	
		$F0	3D CD 00 08 A6 2B 90 DB	
		$F8	4C 01 08 00 00 00 00 04	

Bud Myers

Need More softkey for Educational Software!

As computer coordinator for an elementary/junior high school, I try to balance budget against software needs for twenty computers. I hoped that your publications might help. So far, they have not.

In your Books of Softkeys I, II, and III and COMPUTIST magazine issues for August, September, October and November, the majority of the offerings are for games. Of the educational programs covered, I have already been able to copy all but two. They include *Bag of Tricks*, the *DLM* and *MECC* series, Apple and Krell *Logo*, *Bank Street Writer* original and version III, *Term Paper Writer*, and *Microzine* (some issues).

Readers Data EXchange

The two programs I have been unable to copy are *Award Maker Plus* and *Word Attack*. The method given in COMPUTIST #48 for *Award Maker Plus* does **not** produce a working copy. It appears to load and run, but when printed, yields only a message to use the original disk.

I am no computer expert, but I am not exactly a neophyte either. It really does not matter to me if backup copies retain the publisher's protection or not, as long as I can avoid putting original disks in the hands of school children. Your instructions for removing copy protection leave a great deal to be desired in terms of clarity, not to mention the fact that those I have been able to follow do not work.

When I can find no more than ten or fifteen programs among the hundred or so listed in the works I have, and when I can copy virtually all of those with commercial copy programs, it seems to me your so-called "service" is more of a disservice to people like myself.

I realize that you can do nothing about my dissatisfaction, which is as much my fault as yours; I merely wanted to express it. Thank you for listening to me do so. I shall read the remaining issues of COMPUTIST for which I have paid, but not with any hope of finding anything useful.

Help for the Beginner

Award Maker softkey didn't work

I am new to the deprotection process. I have been reading your magazine for a few months now and decided to try a deprotect. I tried with a simple process on *Award Maker Plus* from COMPUTIST #48.

I followed the directions, yet when I run my unprotected version I do not get any certificate printed, only a border and top and bottom and about 1-2 inches on each side.

What is happening? The instructions were too simple to make a mistake. I used my Apple IIgs system copy program and copied ProDOS 8 onto the new diskette.

If the simple softkeys are this much trouble, what about the hard ones?

James Mahr

EDD Parms for *Award Maker*

I have been trying to back up my *Award Maker Plus* for six months without success. I tried the softkey in COMPUTIST #48, page 27 and that didn't work. I thought it sounded too easy.

Then I tried the softkey in COMPUTIST #50, page 10 and that didn't work. The bytes were there just like in the softkey and I changed them without success.

I have *Locksmith* and *Copy II Plus* but they don't have parameters for *Award Maker Plus*.

Finally, for Christmas I got *EDD 4 Plus* and after trying half a dozen different parameters I succeeded in backing up *Award Maker Plus*. The parameters I used were:

copy tracks 0-34, sync-yes, nibble count-yes (manual), bit copy-yes.

To manually do a nibble-count, you have to adjust your drive speed as the copy program runs.

Side one of disk A is the only protected side of the four sides. The other three sides I copied with *Locksmith* fast copy.

Unfortunately, all this produced is a protected copy. I will watch my future issues for a softkey that will deprotect my *Award Maker Plus*. Somebody out there keep trying.

Edward Teach

Softkey for...

Award Maker Plus
Baudville

■ **Requirements**

☐ Four blank disks
☐ A whole-disk copier
☐ A sector-editor

I read the softkeys in COMPUTIST #48 and COMPUTIST #50 for this program. **Unfortunately neither one would work on my disk.**

To locate the nibble/signature check, I scanned the disk for $C08C (remember to search in lo-byte/hi-byte order 8C C0). The only interesting place to use these bytes was on track $00. (Interesting in that once a byte was read it was then EORed and ANDed and then stored.)

Usually after a C08C you find D5 AA 96 or DE AA being checked. But here, the nibble found was manipulated and stored or checked in some way. So after placing a break instruction at various points in the code I was able to figure out what the program needed to complete its check.

I hope that this softkey works for the people that the other ones did not work for.

Trk	Sct	Byte(s)	From	To
$00	$05	$FA-FB	05 A5	A9 00

Enjoy.

Now if the REDEXed will remove this from the Most Wanted list as well as *Mind Mirror*. The crack in COMPUTIST #49 worked perfectly).

Christoper Dean

Softkey Addendum for...

Color Print Shop
Broderbund

Your softkey for the *Color Print Shop* was incomplete. It will deprotect the front side, but the back side needs work.

The disk has an update *Print Shop Companion* function which updates the companion for color. However, before it updates it will check the companion disk for a protected track $22 checking for bytes A5 DF D4. There are three checks of this nature which must be removed. To do so, perform the following sector edits:

Trk	Sct	Byte(s)	From	To
$10	$06	$26-28	BD 89 C0	4C DF B6
$06	$0D	$FC-FE	BD 89 C0	4C 48 12
$06	$0E	$7D	38	18

Thomas V. Rapheld

† *Softkey for...*

Empire I & II
EDU Ware

Two games which are not well known, but deserve more attention, are *Empire I* and *Empire II*.

An *Empire III*, although promised, was never produced. I believe the original distributor, Interactive Fantasies, was bought out by EDU Ware Services, Inc. These are excellent pre-*Ultima* role-playing games.

Charles S. Taylor provided softkeys for both games in COMPUTIST #47. Neither of these methods worked for my versions of *Empire* (both of which are version 1.5). Both of my versions had altered RWTS that would boot starting at memory location $B700, instead of $B800 as described by Mr. Taylor. Although I used a *COPYB* program to make a playable copy, a modified version of Mr. Taylor's softkey should work.

Step 5 of his softkey should be changed from:

1900<B800.BFFFM

to:

1900<B700.BFFFM

With the above modifications to Mr. Taylor's softkey for *Empire I* both *Empire I & II* are *COPYA*-able.

Readers Data EXchange

Dennis Gaunt

Playing Tips for...

Lode Runner &
Championship Lode Runner
Broderbund

Slower or Faster Play Speed

I just found out from a friend that both *Lode Runner* and *Championship Lode Runner* can be greatly slowed down or speeded up by using the left or right arrow keys respectively. This is handy for quickly clearing screens on the Championship version. Of all the various playing tips for these games I've never run across this one.

(?) *Moebius* is a great, complex game in which one moves through a total of four "planes" of existence. You only get three lives, although you can add additional lives by freeing Monks.

Anyway, can anyone come up with an APT for adding men to this game? It's very frustrating to spend days getting to the second or third plane then die and have to start all over again.

More on printing the Starter Kit doc

Boot up an older version of *Copy II Plus and turn on your printer, telling Copy II Plus* that you have done so. Then, select the VIEW FILES option, select TEXT and select the DOC files on the Starter Kit. It will ask if you want a printout. Type "Y" and the files will be printed.

They will not be as neat as from a regular word-processing program but it is a hardcopy. You need to press **RETURN** several times to dump all the file.

Your printout will be on the left-hand side of the page and you won't have upper or lower margins but the printout is handy.

Don Druce

Attn: Robert Brown

Quite some time ago I requested that you place *Create with Garfield* on your Most Wanted list. I was quite pleased when I saw the response in COMPUTIST #44, responding to my request. Unfortunately the explanation leaves me with a few questions.

I can follow the author's idea regarding modifying DOS, and then making a copy with *COPYA*. I cannot follow his sector-edits.

He specifies track $1D, sector $02, and track $1F, sector $00 and track $1F, sector $06 as well as track $22, sector $04. The specific byte locations are **not** specified.

He mentions to change the bytes to `18 F0 82 49`. I cannot make any sense out of this code!

In the example he says that one change would be track $1F, sector $00—$18: `A2 00 60`. Is this what I should search for? The layout leaves me confused as to what is required.

I would appreciate it if Mr. Brown (from Australia) would give more specific information. IE: Track XX sector YY start at byte ZZ and change from AA BB CC DD to GG HH II JJ.

Frankly, Don, we didn't understand Mr. Brown either. We decided to publish the letter as-is in the hopes that someone with the original disk would understand and forward a translation to us.

So, does anyone have anything for us? Perhaps Mr. Brown?.....RDEXed

Kevin Lepard

I recently came across a 3½"disk copy of *PFS:Write*. Annoyingly, the program requires brief access to the 5¼"disk version before it will run. Otherwise, the program did not seem protected. That seemed like a pretty lame protection scheme and I decided to remove it.

After much cursing, wishing for a step-and-trace utility (my computer at work lacked the *Senior PROM*), and looking through ***Beneath Apple ProDOS***, (not to mention more time than I care to admit), I found the code that sent the computer off to never-never land if the 5¼"disk wasn't available.

Anyway to remove the check for the 5¼" disk, type the following:

```
BLOAD WRITE.SYSTEM,A$2000,TSYS
CALL-151
22A9:EA EA
BSAVE WRITE.SYSTEM,A$2000,TSYS
```

There you go. I've tested this directly off the 3½" disk and off a RAM disk, and everything seems to run perfectly.

David R. Erickson

(?) I remember reading an article in COMPUTIST #39 entitled ***Abusing the Epilogues*** wherein details were given on how a DOS 3.3 disk could be copy-protected. I was very much interested in the article and subscribed hoping I would find similiar articles on copy-protection schemes involving ProDOS. So far I have not been able to adapt this method to ProDOS and would be interested in seeing such an article.

Well, how about it, readers?

Warren Vartanian

(?) I have been trying unsuccessfully, for some time now to deprotect and backup my orginal copy of *Snack Attack* by Data Most (1981). It's a single load program on a modified DOS 3.2 format and I know that the protection involves a bit-insertion routine.

COPY II Plus will copy it but the copy takes forever to boot due to all the head recalibrations it does and then, once loaded, it often doesn't work properly. Do you or any of your readers have any suggestions?

Peter J. Sarantos

(?) I need help! Is there anyone out there that knows how to get an Apple IIgs and a DEC LA50 printer to work together?

Erik Thuse

You are now often requiring a "block-editor" in order to use the softkeys. Please let some of us know what this is; give a few examples of such editors.

A block-editor is to ProDOS what a sector-editor is to DOS. Both programs allow you to edit data directly on the disk.

Bob Bergstrom tells all about it in COMPUTIST #26 where he presents his own block editor......RDEXed

Al Burson

Softkey for...

Black Magic
Datasoft

■ **Requirements**

☐ 48K or more
☐ Super IOB
☐ Sector editor

Black Magic is one of the best arcade/adventure games since the *Castle Wolfenstein* duo. It has very good hi-res graphics and excellent game mechanics which involve strategy and thought as well as arcade skills. It has quickly become my favorite game of its genre. Unfortunately, like most other games on the market, it is copy-protected.

The Protection

Since *Black Magic* writes to disk in order to store the high scores, I consider a backup copy a necessity. Making a nibble-copy proved extremely difficult.

Examination of the disk with a nibble-editor showed why. Each track has 256 bytes of AA's followed by the FF sync gap.

After several tries (and experimentation with parameter changes), I finally came up with a copy that would boot about half the time. Since this was unsatisfactory, I decided to deprotect the disk.

Re-examination of the disk with a nibble editor showed that on track $Ø1 everything was normal (excluding the big block of AA's) except for altered data epilog bytes of FF AA instead of DE AA.

The rest of the tracks (except for track $11) had the address and data prologue bytes reversed - D5 AA AD for the address prologue and D5 AA 96 for the data prologue. Track $11 was comprised mainly of sync FF bytes, which I took to be some sort of nibble count track. As it turned out, this was not the case, but more on track $11 later.

The Crack

I created the controller that follows this article, merged it with *Super IOB* and copied the disk. Of course, the resulting copy would not boot, so I did the obvious - I used a sector-editor to search for CMP #$96 and CMP #$AD (the two bytes used in the address and data prologues). These were found on track $ØØ, sector $Ø2 and track $ØØ, sector $Ø9 respectively.

I reversed the #$96 and #$AD values and to my surprise the disk booted! I played the game with a write-protect tab on, collected all six eyes and made my way past the Blind statue and to Zahgrim's castle before I was killed.

My, this was easy, I thought. I took the write-protect tab off, played again and recorded the high score.

The third time I played, instead of the shaking skeleton and falling tombstone shown when you inevitably die, my disk drive started making obscene noises and the video display looked extremely strange.

I almost gave up and resigned myself to playing without the ability to save high scores. However, after some poking around in the monitor I found LDA $CØ8D,X followed by LDA $CØ8E,X which are the commands for 'sense write-protect'.

Tracing this code I found LDA #$AD and LDA #$96 on track $1A, sectors $Ø4 and $1C. Reversing the two bytes resulted in a deprotected copy.

Now by installing the controller into *Super IOB* and making the sector-edits you will have a deprotected version of *Black Magic* that is perfectly *COPYA*-able. However, as soon as you record a high score, track $11 is erased to sync FF's and a single sector (sector $ØØ) on the track is written with the high scores saved to this sector. The rest of that track consists of sync FF bytes. This is at most a minor inconvenience, since *Locksmith Quick Copy* or a similar copy program with "ignore unreadable sectors" ability will produce a *COPYA*-able copy. If you do not have such a copy program, you can copy all the tracks (except track $11) with a sector copy program or Super IOB. If you also copy track $11, sector $ØØ, you will preserve the high scores, otherwise the scoreboard is reset to blanks.

1 Install the controller into *Super IOB v1.5*.

2 Run *Super IOB* and format the target drive with a volume number of 254.

3 Make the following sector-edits:

Trk	Sct	Byte(s)	From	To
$ØØ	$Ø2	$45	96	AD
$ØØ	$Ø9	$1F	AD	96
$1A	$Ø4	$36	AD	96
$1A	$ØC	$9D	96	AD

Controller

```
1000 REM BLACK MAGIC CONTROLLER
1010 TK = 1 : LT = 17 : ST = 15 : LS = 15 : CD = WR : FAST
     = 1 : MK = Ø
1020 RESTORE
1025 GOSUB 190 : GOSUB 210 : GOSUB 490 : GOSUB 610
1030 GOSUB 230 : GOSUB 490 : GOSUB 610 : IF PEEK
     (TRK) = LT THEN 1050
1040 TK = PEEK (TRK) : ST = PEEK (SCT) : GOTO 1020
1050 IF MK = Ø THEN MK = 1 : GOTO 1060
1055 GOTO 1070
1060 TK = 18 : LT = 35 : ST = 15 : LS = 15 : CD = WR : FAST
     = 1 : GOTO 1020
1070 TK = Ø : LT = 1 : ST = 15 : LS = 15 : CD = WR : FAST = 1
1080 POKE 47413,255 : GOSUB 490 : GOSUB 610
1090 GOSUB 230 : GOSUB 490 : GOSUB 610 : IF PEEK
     (TRK) = LT THEN 1300
1110 TK = PEEK (TRK) : ST = PEEK (SCT) : GOTO 1080
1300 HOME : PRINT "COPYDONE" : END
5000 DATA 213,170,173,213,170,150
```

Controller Checksums

```
1000 - $356B      1060 - $F2B4
1010 - $F33F      1070 - $92A7
1020 - $0293      1080 - $39D2
1025 - $9FE9      1090 - $2B49
1030 - $AA70      1110 - $5540
1040 - $1912      1300 - $3F55
1050 - $3712      5000 - $1F78
1055 - $2B71
```

A.P.T. for...

Black Magic
Data Soft

Why Die?

I almost hate to give this one: the game is so enjoyable without cheating. But frustration at almost-but-not-quite-ever winning led me to develop this APT in order to assure myself there was a way to defeat the evil Wizard.

Use a sector editor to search for the bytes C6 E5 (Hex for DEC $E5). On my disk they occurred 16 times on tracks $ØØ—$Ø5 (there're lots of ways to die in this game). Change these bytes to EA EA (NOP's). This makes you immortal with nothing able to decrease your hit point total.

If you wish to cheat to a less drastic degree, you can do selective changes. For example, NOPing the bytes at track $Ø3, sector $Ø1, bytes $9F and $AØ will render you invulnerable to bats, demons, and ghosts. NOPing the 4 bytes at track $Ø5, sector $ØF, bytes $A3—$A6 will make the death-spitting plants harmless.

Chuck Eley

Is BCE out-of-business?

I would like to tell you about a mail-order nightmare. It all began when I ordered a modem and an Apple floppy drive from BCE of Arlington, Virginia. I placed this order by telephone and used my Mastercard. The sales person assured me that both items were in stock and would be shipped immediately. One month later, I learned the drive was not in stock and a one week wait was promised. In the meantime, I received the modem which I had to return because it was defective. Another month later, the drive still had not been shipped and the replacement modem had been back-ordered. I canceled the orders at this point and requested a refund. The sales person assured me that my credit card would be credited (they charged me the day I placed the order) the next day. Well, another month passed and my credit

card still had not been credited with the amount that should not have been taken in the first place. I called BCE and was informed that they have filed Chapter 11 bankruptcy and that I would be receiving a letter regarding this matter. I have not as yet received this letter, but I have turned this matter over to my bank whose credit card I used.

I may have lost $288 in this ordeal but I have learned a valuable lesson. That lesson is COD only!

I would like very much to see this letter printed because BCE still advertises in at least two publications and I think your readers should know that all is not kosher at BCE.

Jerome Thelia

Softkey for...

Infiltrator II
Mindscape

■ **Requirements**

- ☐ *Infiltrator II*
- ☐ Bit-copy program or *Disk Muncher* 1.0
- ☐ Sector-editor
- ☐ Blank disk

Infiltrator II is a follow-up to its popular tongue in cheek predecessor in which you, Johnny "Jimbo Baby" McGibbits, must put an end to the evil doings of the Mad Leader. The Mad Leader is back, and so is Jimbo Baby, in three new missions.

The graphics are still excellent, the story as humorous, and the protection relatively easy to dismantle.

When I got *Infiltrator II*, the first thing I did was reread Michael Crawford's softkey for *Infiltrator* (COMPUTIST #49). Like *Infiltrator*, track $00, sectors $00—$09 are in standard DOS 3.3 format and can be read by any sector-editor.

However, the rest of the disk as well as the second side has altered data epilogs. I found code on track $00, sector $09 virtually identical to the code mentioned in the *Infiltrator* softkey also track $00, sector $09.

The sector-edits for this sector in the *Infiltrator* softkey involved circumventing the results of a disk check that would otherwise crash the disk.

I implemented these changes but my backup crashed anyway. To find out exactly where the branch was that would cause an unsuccessful boot, I performed a boot-trace using *Locksmith*'s handy boot-trace function. The branch to the "crash code" seemed to lead to code at $200.

After scanning the disk for references to $200, I found one on track $00, sector $08 in the form of a JSR $200. I removed the branch, booted my copy and sure enough, it booted all the way.

Since the alterations in its DOS only involve the data epilog, both sides of *Infiltrator II* can be backed up using a good bit-copy program, such as *Locksmith*, or a fast copy program that ignores the data epilog, like *Disk Muncher* version 1.0.

[1] Backup *Infiltrator II* using *Disk Muncher 1.0* or a good bit-copier.

[2] Perform the following sector-edits on side one of the copy.

Trk	Sct	Byte(s)	From	To
$00	$08	$EA-EC	20 00 02	18 60 42

Jerry F. Market

? In COMPUTIST #44, page 8, you published parameter changes to copy the program *Jane* by Arktronics which is now out of business.

With the version that I have, these will not allow me to make back-up copies. The manual tells how to make a copy, but this does not work either.

I have an enhanced IIe with 128K and a IIe mouse.

Does any reader have other parameter changes or softkeys to allow us (me and other readers) to make back-up copies?

David Ciotti

Playing Tips for...

Conan
Datamost

I have a playing tip for *Conan*. When on the fourth level, to avoid the Floaters just rest on the upper third of either ladder. Make sure your arms don't extend above the ladder and you will be safe indefinitely. If you are patient, a quick trip up or down the ladder will get you all the swords and jewels you need. Make sure to take a jewel with you to the next level.

Matt Ownby

**IIgs Softkey for...*

Music Construction Set
Electronic Arts

Here is a IIgs softkey for *Music Construction Set* that I have modified from other softkeys, so I didn't need a block-editor, and because my version was a tiny bit different from the others.

■ **Requirements**

- ☐ *Music Construction Set*
- ☐ Sctor-editor with disk-searcher
- ☐ *Copy II Plus 7.4* (or a program that can copy 3½"disks and transfer files from 3½"drives to 5¼"drives)
- ☐ Blank 3.5 disk
- ☐ Formatted ProDOS 5¼"disk

[1] Make a copy of *Music Construction Set*.

[2] Copy the file *JIMSCODE* onto your 5.25 disk.

[3] With your disk searcher, search for the byte sequence 20 00 BF C5 42 49 20 C2 4A B09.

[4] Change it to EA EA EA EA EA EA EA EA 80 and write it back to the disk.

[5] Transfer *JIMSCODE* back to your copy of MCS.

SIOB Softkey for...

Snooper Troops
Spinnaker Software

■ **Requirements**

- ☐ Super IOB 1.5
- ☐ Copy II Plus (or any program that can copy DOS)
- ☐ A blank copy
- ☐ A copy program that can ignore errors

Snooper Troops is a mystery game by Spinnaker Software. Examining the disk, I found that on tracks $00—02, the address epilogue bytes have been changed to ED instead of DE.

On tracks $03—08 and $0A—22 the address prologue has been changed to BB instead of D4.

On track $09, there were no prologue and epilogue bytes, so I ignored it. The controller reads tracks $00—08 and $0A—22.

[1] Install the controller into Super IOB and copy the disk.

[2] Copy a normal DOS 3.3 onto this copy of *Snooper Troops*.

[3] Boot it. If it doesn't load up, turn the computer off and boot it again. This time it will work fine.

[4] Make a copy of the disk with a copier that ignores errors. The copy will be totally deprotected.

Readers Data EXchange

Controller

```
1000 REM SNOOPER TROOPS CONTROLLER
1010 TK = 0:ST = 0:LT = 9:CD = WR
1020 T1 = TK: GOSUB 490
1030 GOSUB 220
1040 IF TK > 2 THEN POKE 47445,187
1050 IF TK < 3 THEN POKE 47505,237
1060 GOSUB 430: GOSUB 100:ST = ST + 1: IF ST < DOS
     THEN 1060
1070 IF BF THEN 1090
1080 ST = 0:TK = TK + 1: IF TK < LT THEN 1030
1090 GOSUB 490: GOSUB 230
1100 TK = T1:ST = 0
1110 GOSUB 430: GOSUB 100:ST = ST + 1: IF ST < DOS
     THEN 1110
1120 ST = 0:TK = TK + 1: IF BF = 0 AND TK < LT THEN
     1110
1130 IF TK < LT THEN 1020
1140 TK = 10:ST = 0:LT = 35:CD = WR: IF ZV = 10 THEN
     GOTO 1160
1150 ZV = 10: GOTO 1020
     1160 HOME : PRINT "COPYDONE!" : END
```

Controller Checksums

```
1000  - $356B      1090  - $2275
1010  - $186E      1100  - $40CB
1020  - $03E2      1110  - $7ECA
1030  - $FDF7      1120  - $69C2
1040  - $2675      1130  - $5F9F
1050  - $7F07      1140  - $AE2C
1060  - $7003      1150  - $CC2F
1070  - $26AF      1160  - $AB35
1080  - $95F6
```

Joseph P. Walczak

Problem with the softkey for...

Term Paper Writer

I am a new subscriber to COMPUTIST and I'm presently just "getting my feet wet". I find the magazine very interesting. My greatest fear is purchasing copy-protected software, without a back up, and having it crash one way or the other.

Ⓠ I tried out the softkey for *Term Paper Writer* as described in COMPUTIST #49. I found 20 51 2D (track $1C, sector $03, byte $38) and 4C CF 2D 00 (track $1C, sector $03, byte $C0) and made the necessary changes.

I was unable to successfully boot the copy. When I tried to boot the unedited copy it hung up. When I tried to boot the edited copy it presented me with an ERROR #8 message.

I used *Copy II Plus 7.1* for the copying and sector-editing. Any suggestions?

John Wulfken

**IIgs Softkey for...*

Print Shop IIgs

Broderbund

Cracking *Printshop GS* is not difficult. All you need is a copy of *Printshop* (errors OK) and a utility like *Copy II Plus*.

1 Transfer file *MF* to a formated 5-1/4 blank disk.

2 Use a sector-editor to locate bytes AB 20 61 42 20 and change to AB 20 61 42 60.

3 Transfer the file back to your copied disk and enjoy.

Dr. Leigh Rowan-Kelly

I must say that I like the new format! You did suffer from a few bugs though - in softkey for *Alternate Reality* you substituted "* 60" in lieu of "Step 6". I am sure that most will have no trouble with it however.

**IIgs Softkey for...*

Silent Service

MicroProse

I have another for you now - *Silent Service* IIgs by MicroProse . To fix it make the usual copy via anything, ignoring the bad block error you will get on Block 7. Then using any sector-editor (i.e. *ZAP* from *Bag of Tricks II*, with Blocks set to $63F [1600]), read the following bytes and make the necessary changes.

Block	Byte(s)	From	To
$1C4	$1F6-1F9	F0 05 A9 20	EA EA A9 60
$1C6	$27-2A	F0 05 A9 20	EA EA A9 60
$1C6	$5C-5F	F0 05 A9 20	EA EA A9 60
$1C7	$117-11A	F0 05 A9 20	EA EA A9 60

If you do not find them as listed then search (using the 'L' Command in *Zap*) until you find the 4 places those same bytes appear and change each as shown.

Larry Newby

An Index to Softkeys for $2

I've been a faithful COMPUTIST fan since I read my first article back with Vol. 1, No. 1. I've watched the transition through CORE/HARDCORE to the present day COMPUTIST with great enthusiasm. The only thing that has bothered me was finding the softkey for a particular piece of software in 50 separate volumes. This brings me to the reason for writing this letter.

I've compiled an Appleworks Database which contains the Program Name, Issue Number, and Page Number for all of the Softkeys you have published since HARDCORE COMPUTIST #1. It contains well over 900 entries and makes the job of finding that one particular Softkey a lot easier.

If any of your readers would be interested in obtaining this Appleworks Database file for their own use they should send **$2.00** (to cover the cost of the disk, mailer and postage) to me and I'll be glad to ship them a copy. Thanks a lot for the space and keep up the good work!!

Thanks go to you Larry. We've received several dozen letters from readers about the very same database. Some have even sent copies to us. Your offer is quite reasonable. How about the rest of you? Do you have the ultimate COMPUTIST index and are you willing to share it with us. . . . . . RDEXed

Eric Delbridge

Playing Tips for...

Lurking Horror

Infocom

If you have the master key, do the following to reach forty points:

- The flashlight is in the elevator.
- On the forklift, go to ancient storage room. CLEAR JUNK several times, then go East.
- Remove cover with crowbar. Go down. Go North then down again. Get the knife. Go back to the basement.
- Go to the stairs. Enter the infinite corridor. Take the container.
- Go up to the great dome. Wear gloves, climb rope. Open the door. Go outside, then up. Get plug, drop it, get note, go back inside.
- Go back to the corridor. Wait for the waxer to leave. Go east. Repeat this until you are at the fire axe. Break glass. Get axe. Cut cord. Open container. Pour wax on floor. Wait for man to come after you. Once he is on the wax go East to the end of the hall.
- Go South. Knock on door. Wait. Show note. Go South. Wait for professor to enter pentagram. Cut pentagram with knife. Exit pentagram. Move bench. Open panel. Go down. Close panel.

Readers Data EXchange

Playing Tips for...

Stationfall
Infocom

Do this one on the space station.

- Go to the printing level. Open trash. Get illegal village entry form.
- Go to the laundry level. Press form with presser.
- Go to administration level. Enter CO's quarters. Look under bed. Get stamp. Validate all forms. Go to military module connector. Put illegal village entry form in slot. Enter village. Have fun!

Playing Tips for...

King's Queen II
Sierra On-Line

- Once you have the first key and the bird from the witches cave, read the second door.
- Go to the antique shop. Buy the lamp with the bird.
- Polish lamp. Use carpet. Polish lamp twice more. Put bridle on snake. Get the key. Ride carpet back.

Ronald Mundell

† *Softkey for...*

Disney's Comic Strip Maker
Bantam Software

A.L. Head's softkey for *Walt Disney's Card & Party Shop* works for the *Comic Strip Maker* by just changing line 30.

Instead of: 30 PRINT D$ "BRUN START"

Change to read:

30 PRINT D$ "BRUN FUN"

Everything else works fine.

? I have tried all of the suggestions for deprotecting Activision's *Music Studio*, and none of them work. Anyone have more ideas??

Frank Anderson

? I have a program called *Casino* by Bob Rosen (Data Most) which I am trying to modify. The random numbers generator is not too random. I cannot get into the thing to list out the program but can copy it with *EDD*. Does anyone know anything that could help me?

P.S. Data Most seems to be no more.

Jose Narvaez

Really Need softkeys for...
Passport Design software

My name is Jose Narvaez, I am Spanish and a subscriber to your magazine.

I am the owner of a commercial audio recording studio, and the computer is something very important in this job. I use it to control the synthesizers and effects, with MIDI recording software, to store the parameters of the synthesizer's sounds and to translate into sheet music what is played on the keyboards, etc., etc. I have an enhanced IIe with a Passport MIDI interface, a 1 Meg. Ramworks III and a 1 Meg. Ramfactor.

My problem is that I have to switch many times from one program to another and I lose too much time on this. I have tried to store those programs permanently on the Ramfactor (with a battery back-up option). They are protected and I can't do this. I wrote to Passport Designs to tell them about this but they didn't answer. I subscribed to COMPUTIST for this reason, but my knowledge of programming and computers is not advanced enough to deprotect those programs.

The programs are all from Passport Designs: *Master Track - Pro*, *Polywriter* and *Polywriter Utilities*. The *Master Track Pro* is copyable with Copy II Plus (ProDOS version), but I can't copy to Ramfactor and that is what I need. The *Polywriter* program (sheet music of what is recorded with *Master Track Pro*) and the *Polywriter Utilities*, I couldn't copy at all.

? So that is the reason I'm writing this letter. What can I do? I would be very thankful if you could give me a solution or the name of someone to contact, or some instructions that could help me to deprotect and store this program on the RamFactor.

Well how about it readers, is anyone else having a problem with this software? Better yet, has anyone solved this problem?..RDEXed

Jeff Tucker

? I need suggestions concerning William O. Romine's article on "Capturing Locksmith Fast Copy for the IIgs," as noted on page 37 of COMPUTIST #50. The technique did not work with my version of *Locksmith* 6.0.

RDEX END

MOST WANTED Softkeys

ABM *Muse*
Accolade Comics *Accolade*
Agent U.S.A. *Scholastic*
Airheart *Broderbund*
Algeblaster *Davidson & Associates*
Algebra I *Intelligent Tutor*
Apple Super Pilot *Apple*
Ballblazer *Epyx*
Balance of Power *Mindscape*
Bandits *Sirius Software*
Bank Street Filer *Broderbund*
Barron's Computer SAT *?*
Brain Bank *The Observatory*
Captain Goodnight *Broderbund*
Certificate Library Vol. 1 *?*
Championship Baseball *Activision*
Colossus IV *Firebird*
Create with Garfield *DLM*
Cross Clues *Science Research*
Crossword Magic *Mindscape*
Crypt of Media *Sir Tech*
David's Midnight Magic *?*
DB Master V4.0 *Stoneware*
Deep Space *Sir Tech*
Earth Orbiting Station (EOS) *Electronic Art*
Fay: The Masked Woman *Didatech Software*
Fay's Word Rally *Didatech Software*
Fay: Word Hunter *Didatech Software*
Fun Bunch *Unicorn*
Gemstone Healer *SSI*
GoldFinger *Mindscape*
Goonies *Datasoft*
GradeBusters 1-2-3 *Gradebusters*
Gutenburg Jr. & Sr. *Micromation LTD*
Handicapping System *Sports Judge*
Hardball II (IIgs) *Accolade*
J & S Grade Book *J & S Software*
Jigsaw *Microfun*
Legacy of the Ancients *Electronic Arts*
Marble Madness (IIgs) *Electronic Arts*
Mathblaster *Davidson & Associates*
Microzine 22 *Scholastic Software*
Mind Mirror *Electronic Arts*
Movie Monster Game *Epyx*
Odin *Odesta*
Operation Frog *Scholastic Software*
Peeping Tom *Microlab*
Personal Finance Manager (PFM) *Apple*
Prime Plotter *Primesoft Corp.*
Print Master *Unison World*
Pro-Football *Sports Judge*
Quiz Castle *Didatech Software*
Snoggle *Broderbund*
Stellar 7 *Penguin Software*
Success with Typing V1.2 *Scholastic Software*
Super Factory *Sunburst*
Think Tank *Living Video*
Tower of Myraglen II (IIgs) *PBI Software*
Type *Broderbund*
Visiblend *Microlab*
Where in USA is Carmen Sandiego *Broderbund*
Wings of Fury *Broderbund*
Work Force II *Core Concepts*
The Works *First Star Software*
Zorro *Datasoft*

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Mike Basford

I am glad that you are going to start printing cracks for non-Apple computers. If the quality of the "Foreign" cracks is up to the quality of the Apple stuff, you should attract a whole new (and very large) audience. Many of these are not mine. They are from BBS's. I hope this opens the flood-gates on the battle against copy-protection.

Softkey for...

LOTUS 1-2-3 ver. 1A

Lotus Developement Corp.

```
RENAME B:123.EXE B:123.TMP
DEBUG B:123.TMP
F 4EF L6 90
W
Q
RENAME B:123.TMP B:123.EXE
```

There is a version of *Lotus 123* called *Release 1A* but with a different copy-protection technique. It can be identified by an "*" that displays on the first screen under the "s" in the word "Release".

The following will deprotect this version so it can be run on a hard disk without requiring the System Disk in drive A.

```
RENAME 123.EXE 123.TMP
DEBUG 123.TMP
U AB8C
```

If you see "MOV CX, ØØØ2" then continue, if you don't, something is different and this won't work.

```
E AB8C C3
W
Q
RENAME 123.TMP 123.EXE
```

Fix for...

LOTUS 1-2-3

Want to get rid of the Lotus Logo page on *Lotus 123*? Do the following. (On your backup copy, of course.)

```
RENAME 123.EXE 123.FUN
```

Put the disk with *123.FUN* in drive A and the disk with *DEBUG* (from your System Master) in drive B.

```
B:DEBUG A:123.FUN
S CS:Ø1ØØ LFØØØ 3C FF 74 Ø5 E8 A8
   XXXX.Ø4BF
E XXXX.Ø4BF
W Writing 15FØØ bytes
Q
RENAME 123.FUN 123.EXE
```

Softkey for...

Flight Simulator 1.ØØ

Microsoft

This procedure may **not** work on the version which has color on RGB monitors.

1 Take an unformatted (unused) disk and place it in drive B.

2 Place your DOS disk (with DEBUG on it) into drive A.

3 Use *Debug* to make some changes.

```
DEBUG
E CS:ØØØØ B9 Ø1 ØØ BA Ø1 ØØ BB ØØ Ø1
    ØE Ø7 Ø6 1F 88 E8 53 5F AA 83 C7 Ø3
    81 FF 1C Ø1 76 F6 B8 Ø8 Ø5 CD 13 73
    Ø1 9Ø FE C5 8Ø FD ØC 76 E1 9Ø CD 2Ø
E CS:Ø1ØØ ØØ ØØ Ø1 Ø2 ØØ ØØ Ø2 Ø2 ØØ
    ØØ Ø3 Ø2 ØØ ØØ Ø4 Ø2 ØØ ØØ Ø5 Ø2
    ØØ ØØ Ø6 Ø2 ØØ ØØ Ø7 Ø2 ØØ ØØ Ø8
    Ø2
R IP
XXXX
:ØØØØ          <--------  You enter this.
```

Insert Flight Simulator disk into drive A.

```
G =CS:ØØØØ CS:22 CS:2A
E CS:Ø2 ØE
E CS:27 19
G =CS:ØØØØ CS:22 CS:2A
E CS:Ø2 27
E CS:27 27
G =CS:ØØØØ CS:22 CS:2A
L DS:ØØØØ Ø Ø 4Ø
W DS:ØØØØ 1 Ø 4Ø
L DS:ØØØØ Ø 4Ø 28
W DS:ØØØØ 1 7Ø 3Ø
L DS:ØØØØ Ø AØ 3Ø
W DS:ØØØØ 1 AØ 3Ø
L DS:ØØØØ Ø 138 8
W DS:ØØØØ 1 138 8
Q
```

4 Write-protect the new disk.

Softkey for...

PFS-File

Note: Copy FILE.EXE and/or REPORT.EXE to a disk with DEBUG.COM on it. Never make patches to your original disk.

```
RENAME FILE.EXE FILE.ZAP
DEBUG FILE.ZAP
U 9243
```

You should see:
PUSH BP
MOV AX,DS
MOV ES,AX

If so then continue. Otherwise type "Q" to quit. You don't have the right version.

```
E 9248 EB 2B
W
Q
RENAME FILE.ZAP FILE.EXE
```

You now have an unprotected copy of PFS-File.

Softkey for...

PFS-Report

```
RENAME REPORT.EXE REPORT.ZAP
DEBUG REPORT.ZAP
U 98BF
```

You should see:
PUSH BP
MOV AX,DS
MOV ES,AX

If so then continue. Otherwise type "Q" to quit. You don't have the right version.

```
E 98C4 EB 2B
W
Q
RENAME REPORT.ZAP REPORT.EXE
```

Dean Mason

A.P.T. for...

Bard's Tale

I have found a way to give the *Bard's Tale* characters an even better chance to survive. I used *Norton 4.Ø* to check the files. I found that file Ø.tpw lists all the characters of a team and 1.tpw through 6.tpw lists each individual character. You can alter their abilities by changing certain bytes.

Attribute	Location
Strength	17 & 21
IQ	19 & 23
Dexterity	1B & 25
Constitution	1D & 27
Luck	1F & 29
Hit Points	2D &2F
Spell Points	31 & 33
Items 1—8	35 & every other one
Equiped items	36 & every other one
Gold	49 & 4A
Level	4D & 4F
Conjurer	52
Magician	53
Wizard	54
Sorceror	55

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► A reprint of **Disk Inspection and the Use of Super IOB**, from COMPUTIST No. 17. This article explains how to write your own Super IOB controllers.

► **COMPUTIST No. 32**, which contains an extensive article detailing the hows and whys of Super IOB v1.5 and at least 5 articles using the new Super IOB program.

- Several of the controllers deprotect the software completely with no further steps. This means that some programs are only minutes away from deprotection (with virtually no typing).
- The issue of COMPUTIST in which each controller appeared is indicated in case further steps are required to deprotect a particular program.**

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Volume 1 of the Super IOB collection covers all the controllers from COMPUTIST No. 9 through No. 26. Also included are the newswap and fast controllers from COMPUTIST No. 32. The following 60 controllers are on volume 1:

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