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61 Features •Double DOS •Deprotection tips for DOS and ProDOS •A Search Command for Il's •Zip Chip finally Ships •The Product Monitor •Put a deprotected Where in Europe is Carmen Sandiego on a 3 1/2 inch disk •A self-booting Thexder, Put ProDOS and Thexder on a 3 1/2 inch disk •Capture protected RWTS with RWTS Worm Softkeys •Adventures of Sinbad •ARCHIVEmath •Aztec •Broad-sides v2.0 •Calculus Toolkit •Cannonball Blitz •Catalyst 3.0 •Cofa Courseware •Cross Clues •Deathword •Defender of the Crown •Dondra •Gauntlet •G.I. Joe •King's Quest I •King's Quest II •King's Quest III •Magical Myths •Math Shop •Mathblaster •Mathbusters •Mavis Beacon Teaches Typing •Megabots •Micro Addition/Subtraction •Microzine #25 •Microzine #26 •One-on-One •PFS Computer Checkup •PFS File •PFS Graph •PFS Report •Pirates! •Pirates! IlgS •Presenter •Rescue on Fractalus •Science Toolkit •Smart Eyes •Softswitch •Spiderbot •Tales from the Arabian Nights •Thinkware •Tink's Subtraction Fair •Tower of Myraglen •Ultima V •Xevious APTs •Bard's Tale III •Ultima V Playing Tips •Ultima V •Wasteland Notes •Mindscapes •Scholastic •Hartley Software •Prentice Hall •CAI •CTW Series •Garfield IBM Softkey •Print Shop •Test Drive IBM Playing Tips •Leisure Suit Larry in the Land of the lounge Lizards

60 Features •Reading from Protected Disks •EDASM Transfer Utility •Amper QuickDraw II Routines •Slow Speeds for Arcade Games •A Patch for Copy II Plus •The Product Monitor •Low Cost Alternate Languages •Another method for Copy Protecting DOS 3.3 •Change Appleworks Cursor from a blinking underline to a blinking apple in one quick patch Softkeys •Ace Programmer •Aesop's Fables (GS) •Apple GEOS v2.0 •Arctic Antics •Creating the Constitution •Crossword Magic 4.0 •Death Sword •Dome Bookkeeping •Essential Data Duplicator III (EDD 3) •Garfield Deluxe Edition •Gauntlet IlgS •J & S Gradebook •Kings Quest IlgS •Kings Quest I (GS) •Lazer Maze •Leisure Suit Larry •Magical Myths •Masterytype v2.1 •Mavis Beacon Teaches Typing •Mind Prober/Mind over Minors •NATO Commander v1.2 •Paperboy •Pegasus •Pinball Construction Set •Pool 1.5 •RAD Warrior •Railroad Works •Road Rally USA •Robomath •Science Tool Kit •Search and Rescue •Showoff •Social Studies Vol 1 •Social Studies Vol 2 •Solo Flight •Space Quest •Springboard Publisher •Spy vs Spy III •Star Fleet I v2.1 •Tales of Fantasy: The Dark Tower, Frog & The Fables •Tapper •Troll Courseware: Maps & Globes, Latitude & Longitude •Type! •Ultima V •Wagons West •Zorro APTs •Kid Niki Radical Ninja •Lode Runner •Space Quest II •Thexder Playing Tips

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59 Features •Boot Ilc Utilities on any compatible •Help with Ultima V •Convert Printmaster graphics into Print Shop graphics •The Invincible Bard (III) •The Deprotection Game •Patching ProDOS 1.1.1 •The Product Monitor •AppleWorks and the ImageWriter II Softkeys •APBA Major League Players Baseball •Better Working: Spreadsheet •Better Working: Word Processor •Beyond Pinball •BoulderDash Construction Kit •Calendar •Calendar Crafter •California Games •Championship Baseball •Clip Art Collection vol 1 •Cours Et Gagne v1.0 •Dazzle Draw •Everybody's Planner •GATO v1.3 •GoldFinger •Jumpman •King's Quest •Management Edge •Movie Monster Game •MultiScribe v3.0 •Negotiation Edge •Nightmare Gallery •Patchworks •Picture Phonics •Printographer •Reader's Treasure Chest •Real Math •Sea Strike •Shifty Sam •Simulation Construction Kit •Snoopy's Reading Machine •Snoopy's Skywriter Scrambler •Snoopy to the Rescue •SongWriter •Spell It! •Stickybear Reading Comprehension •Super BoulderDash APTs •Bard's Tale III •Super BoulderDash •Ultima V Playing Tips •Alternate Reality •Auto Duel •Ultima V •Where in the World is Carmen Sandiego IBM Softkey •Chartmaster v6.04 •Clout v1.0 •Copywrit •Graphwriter •Signmaster v5.04

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

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

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Charles R. Haight Editor
Tom Acree Associate Editor
Karen Fitzpatrick Circulation

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Advertising Department
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Readers Data EXchange

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

What is a softkey, anyway?

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

Commands and control keys

Commands which a reader is required to perform are set apart by being in boldface and on a separate line. The **return** key must be pressed at the end of every such command unless other-

wise specified. Control characters are preceded by "ctrl". An example of both is:
6 ctrl P

Type **6**. Next, place one finger on the **ctrl** key and then press **P**. Don't forget to press the return key.

Other special combination keypresses include **ctrl** **reset** and **open-apple ctrl reset**. In the former, press and hold down the **ctrl** key then press the **reset** key. In the latter, press and hold down both **ctrl** and **open-apple** then press **reset**.

Software recommendations

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

- Applesoft program editor such as "Global Program Line Editor (GPLe)".
- Assembler such as "Merlin/Big Mac".
- Bit-copy program such as "Copy II Plus", "Locksmith" or "Essential Data Duplicator".
- Word-processor (such as AppleWorks).
- "COPYA", "FID" and "MUFFIN" from the DOS 3.3 System Master disk.

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 that changes the open-apple ctrl reset vector to point to the monitor. (This will void an Apple //c warranty since you must open the case to install it.)

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

Recommended literature

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

Typing 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
```

Applesoft inserts spaces into a program listing before and after every command word or mathematical operator. These spaces don't pose a problem except when they are inside of quotes or after a DATA command. There are two types of spaces: those that have to be keyed and those that don't. Spaces that must be typed appear in COMPUTIST as special characters (◊). All other spaces are there for easier reading.

NOTE: If you want your checksums to match, only type spaces within quotes or after DATA statements if they are shown as (◊) characters. SAVE the program at periodic intervals using the

name given in the article. All characters after a REM are not checked by the checksum program so typing them is optional.

Typing Hexdumps

Machine language programs are printed in COMPUTIST as hexdumps, sometimes also as source code.

Hexdumps are the shortest and easiest format to type in. You must first enter the monitor:
CALL -151

Key in the hexdump exactly as it appears in the magazine, ignoring the four-digit checksum (\$ and four digits) at the end of each line. When finished, return to BASIC with:
3D0G

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

Typing Source Code

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

Computing checksums

Checksums are 4-digit hexadecimal numbers which tell if you typed a program correctly and help you locate any errors. There are two types of checksums: one created by the CHECKBIN program (for machine language programs) and the other created by the CHECKSOFT program (for BASIC programs). Both are on the "Starter Kit".

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

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

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

SSSS.EEEE ctrl Y

Correct the lines where the checksums differ.

Writing to the RDEX editor

RDEX (are-decks) stands for: Reader's Data EXchange. We print what you write. When you send in articles, softkeys, APTs, etc., you are submitting them for free publication in this magazine. RDEX does not purchase submissions nor do we verify data submitted by readers. If you discover any errors, please let us know so that we may inform our other readers.

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

Because of the great number of letters we receive and the ephemeral and unpredictable appearance of our volunteer staff, any response to your queries will appear only in RDEX, so it would be more appropriate for you to present technical questions to the readers and ask for their responses which will then be placed in the Apple-RDEX.

How to get a free library disk

Whenever possible, send everything on Apple format (5.25" - DOS/ProDOS or 3.5" - ProDOS) or IBM format (3.5") disks. Other formats are acceptable but there may be some delay as we look for someone to translate it for us. (If you use a 5.25" disk, we will return it with the current library disk copied onto it.) Use whatever text editor you like, but tell us which one. Put a label on the disk with your name (or pseudonym) and address (if you want to receive mail). Don't reformat any programs or include them in the text of your letter. Send Applesoft programs as nor-

mal Applesoft files and machine language programs as normal binary files. We have programs to convert them to the proper format for printing. If you are sending source code files, and you are not using the S-C Assembler, send them as normal text files.

When to include a printed letter

- Don't include hardcopy (printout) unless:
- a. You are writing about a bug or other printing error.
 - b. You are writing to ask for help.
 - c. You are answering another readers help request.
 - d. You are writing about your subscription or sending an order for back issues or software.

Bugs, requests for help and answers to requests for help are bumped to the head of the line and go in the very next issue. All other letters are printed in the order that we receive them.

Writing to get help

When writing to request help, be sure to include ALL relevant information. The more information you include, the easier it is to find a solution. There's an old saying that goes "A properly framed question includes 90% of the answer".

How to get mail

If you are interested in receiving mail from other readers, be sure that we have a current address. If you use a pen name and want to receive mail, we need to have your address. Our readers privacy is important, so we will not print your address unless you specifically say too.

How to write to RDEX authors

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

You have a LEGAL RIGHT to an unlocked backup copy of your commercial software.

Our editorial policy is that we do NOT condone software piracy, but we do believe that users are entitled to backup commercial disks they have purchased.

In addition to the security of a backup disk, the removal of copy-protection gives the user the option of modifying programs to meet his or her needs.

Furthermore, the copyright laws guarantee your right to such a DEPROTECTED backup copy:

... "It is not an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program provided:

1) that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or

2) that such new copy or adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful.

Any exact copies prepared in accordance with the provisions of this section may be leased, sold, or otherwise transferred, along with the copy from which such copies were prepared, only as part of the lease, sale, or other transfer of all rights in the program. Adaptations so prepared may be transferred only with the authorization of the copyright owner."

United States Code title 17, §117

The PRODUCT MONITOR

RATINGS

★★★★★
★★★★
★★★
★★
★
?
??
???

SUPERB
EXCELLENT
VERY GOOD
GOOD
FAIR
POOR
BAD
DEFECTIVE

Chessmaster 2100

\$49.95

Software Toolworks

★★★

Requirements:
512K Apple IIgs
one 3.5" drive.

As you may recall, when I staged the first Apple Chess shootout some months ago, program vs. program results were a virtual draw; but the decision went to "Sargon IV" (running on a Mac Plus) on the basis of human player perceptions. Then, the II series representatives were all 8-bit programs. Now, with the advent of "Chessmaster 2100", the first true IIgs woodpusher, it's time for another look!

Rendered in full-color 320-mode super-res, Software Toolworks's latest "Chessmaster" leads off with a choice of three attractive board formats. The 'standard' 2-D display leaves just enough space on the right for player clocks and offers excellent legibility. Clocks fit comfortably above the action in a nearly full-screen 3-D presentation sharp enough for actual play. In the "War Room" format, a crisp 1/4-screen board leaves room for simultaneous display of the "thinking" box, clocks, and moves list.

For just the right 'look', you can set board and piece colors using simple slide adjusters and set texture to "wood" or "metal". You can, of course, play with pieces of any design; but, for now, "Chessmaster 2100" comes with only the Staunton pieces and a design-your-own-pieces template. Each piece set fits on a single \$C1 pic compatible with all IIgs painter utilities.

"Chessmaster"'s approach to setting Level of program playing strength is to offer a flexible "User-Defined" option along with fourteen pre-set "Levels" to establish time allowed per move. This scheme also lets you decide how much freedom to allow "Chessmaster"'s time budgeting routines. For example, the entries "20 moves in 60 minutes" and "1 move in 3 minutes" set roughly the same playing strength; but the first entry lets the program 'budget' more than 3 minutes for some moves and less for others. Additional strength modifier options include "Opening Book", "Newcomer Mode" (i.e. weak play), "Coffee House", and "Easy Mode" (i.e. no thinking on opponent's time).

When its Time Controls are turned on, "Chessmaster" can be instructed to call a "loss on time" if a player fails to make the required number of moves in a given time. In fact, if "Voice" is 'ON', "Chessmaster" literally announces the loss. Beside three preset controls (e.g. "International Tournament", etc.), "User-Defined" permits entering your own. Naturally, you can also set up "all the moves" games (i.e. play "ten-minute chess", etc.). If you are playing the program (instead of another human), clicking the "Equal" option forces "Chessmaster" to match your speed.

Attractive displays and voiced comments ("Got ya!", "You got me", etc.) do make "Chessmaster 2100" a more enjoyable computer opponent; but there's no question that the major 'user-interface' improvement over earlier 8-bit programs is the ease of moving and placing pieces. You just point and click to grab a piece; and, then, move it to the square desired. Setting up positions (often a nightmare in older programs) works the same way; AND, a strong plus, you can start with the current game position or a blank board. An off-board space holds extra pieces and receives any you remove.

To help players improve their chess skills, "Chessmaster" offers the expected "Take Back" and "Replay" functions plus a "Show Thinking" window and "Analyze". "Thinking" displays five half-moves of the current "best line", and a score to indicate its evaluation of the position. While I prefer a true "Window on the Search" showing the line currently being examined, an advantage of "Chessmaster"'s less active approach is that displaying "Thinking" does not seriously impact time use. "Ana-

lyze" is chiefly employed to obtain the program's evaluation of a position during replay or when two humans are playing. It provides a score and suggests a "best play" line. Other skill-honing options can suggest a move, highlight legal move squares for a selected piece, and, for blindfold-chess, render any or all pieces invisible!

While the ready availability of a worthy opponent is a powerful computer chess benefit, I suspect that many chess devotees are at least as enthusiastic about capabilities to save, recall, and list games. "Chessmaster"'s archiving options include game save, load, and delete, plus the usual text character-only board dump, move list printout, and a very nice provision to allow the addition of annotations. I did, however, find one annoying bug. (Right, a for real, non-"feature" BUG.) When a game is loaded from disk, the program fails to adjust piece colors to match those played by the game participants. So, for example, when one of the package's 110 "Classic Games" is loaded, you may find that, in "R. Byrne vs. Fischer", Fischer is playing white. (I'll let you know how Software Toolworks responds.) Also bothersome, when loading one's own games, is the failure to restore Level and other game settings. As to the text character board printout, it's about time that chess programs used available graphics capabilities. A pictorial board printout would be a strong selling point.

It goes without saying that the first step in any SERIOUS evaluation of "Chessmaster 2100"'s playing strength had to be a confrontation with "Sargon IV". Thus, on two separate occasions, JLB (our USCF "A"-rated 'resident chess expert') lugged his "Sargon"-armed Mac across town; and we watched the programs 'duke it out' (at 2 minutes/move). In Game One "Chessmaster 2100" opened with P-Q4, carved out an advantage in the middle game, and went on to victory. "Sargon IV" played N-KB3 to begin Game Two. In the ensuing blunder-riddled slugging match, the last blunder went to "Chessmaster 2100"; the win went to "Sargon IV". Though future meetings are planned, it would seem that the programs are well matched but exhibit somewhat different playing styles. "Chessmaster 2100" emerged as the more gifted positional player; "Sargon IV" is a better tactician.

I've played the new "Chessmaster" several times and watched as JLB, after a string of embarrassing losses, finally achieved a measure of vengeance. There was general agreement that, at tournament speeds, the program could expect to maintain roughly a USCF "B" rating. Aside from confirming that "Chessmaster 2100" is, indeed, an entertaining, tough, and fun to play opponent, the games also served to highlight areas of strength and weakness.

Like positionally oriented human players, "Chessmaster" seems more susceptible to missing "obvious" opportunities than does "Sargon". For example, in one endgame "Chessmaster" (white) had pawns on C3, A4, H4, G6; rook on A7; king on G1. Black had pawns on H5, B6, E6; rook on B5; king on G8. Black moved (rook) B5-A5. The correct response for white is A7-A5 (RxR). Black can recapture; but nothing can stop white from queening one of his passed pawns and winning easily. Instead, even at 7 minutes/move, "Chessmaster" went for A7-E7. (Incidentally, "Mychess II" and "Colossus IV" make the same mistake.) "Sargon III" and "Sargon IV" both found the correct move.

The great advantage of a positional bias is that, especially at higher skill levels, the better positional program usually gets the juicy tactical opportunities. It is also more likely to come up with interesting, instructive innovations. JLB has played countless games against "Sargon" in an effort to hone his "Feared Queen's Pawn Opening" to tournament readiness. Yet, only when he took on "Chessmaster" (at a lowly 2 minutes/move) did he encounter, 'out of the blue', a potentially dangerous new line! Certainly, vis-a-vis "Sargon IV", "Chessmaster 2100" does seem to play more imaginative, more human chess.

So, who's #1 in Apple chess? For a time JLB was giving the nod to "Chessmaster"; but, recently, he has switched to "Sargon". Despite "Sargon"'s better endgame play, I believe "Chessmaster" has an edge due to superior handling of the middle game, where most outcomes are decided. So, pending further analysis, the only fair decision is "draw". For IIgs owners, however, there is nothing ambiguous about ending the long super-res chess drought. Including a nicely done 56-page chess lore booklet, manual, and separate "Classic Games" diskette, "Chessmaster 2100" is a solid win!

Advanced Gravis Analog Joystick

\$59.95

Advanced Gravis

★★★

(Game joystick for Apple II series. IBM version available.)
Size: 6.5"W x 5.0"D x 1.25"H x 4.25" Handle
Centering Tension: adjustable, approx. 150 gm. to 550 gm. (steps 1-6)

Handedness: right
Centering Error: 1.4%H, 1.0%V (step 1 tension); 6.2%H, 1.6%V (step 3); 4.5%H, 0.9%V (step 6)
Centering Defeat: large thumbwheel (step 0)
Movement Range (H): 44 degrees
Useful Range (H): 36 degrees
Centering Adjust: two recessed screws
Connector: Apple DIN

Case Access: four screws, remove feet

Were House Beautiful to do a "Computer Rooms" spread, this black beauty is my bet for the joystick you would find on the tables. Featuring a long forward-arched handle and thin large-footprint case, Advanced Gravis does the buttons and side-access adjustments in red to add just a touch of 'Hot' to its classy good looks.

All three buttons — a contour-fitted thumb switch and two large round on-case buttons — offer the positive feel of short-travel click-action. For the ultimate in switching flexibility, a set of three thumbwheels along the left side lets you set EACH button to PB0, PB1, or PB2. (Note: PB2 availability amounts to a 'future expansion' option. Currently, few programs even look at this input; and those which do are usually two-joystick games which accept PB2 as the fire-button input for a second stick.) With no second in-handle button, placing both on-case buttons to the handle's left is a boon; but, for righthanders only.

Like CH Hayes and Suncom, Gravis has developed yet another new mechanism for its full-hand grip joystick. To get a handle on their 'sliding plates' design, imagine constructing a simple model using two playing cards. Just cut a narrow 1" slot near the middle of each card. Now rotate the top card to make a cross, place a pencil point (i.e. your 'handle') where the slots intersect, and, viola!, you've got it — a kind of Etch-a-Sketch in reverse. Vertical handle motion moves the horizontal-slotted plate (and turns the Y pot); horizontal handle motion moves the vertical-slotted plate (and turns the X pot). Gravis secures its handle in a ball joint with the lower portion fitting into the slots' intersection. Centering tension comes from four springs, one pushing in at the long end of each plate.

Beside supplying the rigidity needed to support a large handle at very low centering errors, the 'sliding plates' approach offers at least two additional benefits. It permits a thinner case profile, conveniently placing on-case buttons at IIgs keyboard level; and it facilitates a unique selectable tension feature. Gravis simply surrounds the entire mechanism with a .5" wide ring, which, to the user, appears as a large thumbwheel accessible on the front and back sides. The four tension springs push against the inside of the ring through ball bearings. Turning the thumbwheel stairsteps the inward push on each spring in six steps. A seventh, zero-tension step lets you defeat centering.

Thanks to good resolution and stability, adjusting the X,Y centering setscrews turned out to be less trouble than anticipated. (Gravis even supplies a nifty little screwdriver.) On my adjustment range 'Elite Test' (i.e. running "Elite" on an accelerator-equipped II+), the Gravis stick could not quite reach the low center values required. You should not count upon using this stick with older action games at accelerated speeds. For any normal application, however, adjustment range is more than adequate.

Despite the clear superiority of mouse-driven painter programs, most producers of higher-quality, more expensive analog joysticks continue to exhibit a reluctance to develop pure games-tick designs. ("Suppose they want to use it for graphics?") In the Advanced Gravis, omission of an in-handle forward trigger button and virtually constant tension over the full range of handle travel are both desirable graphics stick attributes. In a gamestick, they spell "compromise".

Obviously, one would think, two in-handle buttons are better than one; and an under-the-finger trigger makes a better, more natural feeling fire button than a thumb switch. Similarly, there is a natural tendency to expect that increased tension will signal 'more' of whatever it is (steepness of climb, sharpness of a turn, etc.) we are controlling. (If you doubt the power of this conditioning, imagine using a joystick which responds to large handle swings with a marked DECREASE in tension. I actually tested one a few years back. The stick, which employed magnetic centering, proved absolutely worthless for action gaming.) Constant tension joysticks, at least, don't lie; they merely withhold useful information. By way of compensation, Advanced Gravis boasts an exceptionally smooth, firm response. Light 'tension bumps' signal any axis crossing; and there's plenty of handle-angle feedback. Add a padded handle designed for comfortable full-hand or top-of-stick use, and it is small wonder that testers consistently rate the Advanced Gravis feel as among the best.

For those who appreciate succinct characterizations, this is the chameleon of analog joysticks. From high-tension, handle-buttoned flight controller to lighter touch 'pointer' with on-case buttons for adventuring, you can tailor response and switching 'just so', with the turn of a few thumbwheels. Advanced Gravis is a hundred gamesticks in one, each a beautiful performer.

Analog Plus

\$39.99

Suncom

★★★

(Action game joystick for Apple II and IBM)

Size: 3.75"W x 5.25"D x 1.75"H x 5.25" Handle
Centering Tension: approx. 450 gm.
Handedness: none
Centering Error: 2.5%H, 1.47%V
Centering Defeat: none
Movement Range (H): 33 degrees

Useful Range (H): 28 degrees
Centering Adjust: two side-mounted slides
Connector: Apple DIN & IBM DIN
Case Access: four screws

Rendered in two-tone 'battle grey' with red accents and booted handle, Analog Plus delivers the ruggedness and looks of 'professional' gaming parlor units. Suncom supplies stick-on rubber feet and, for true one-handed 'console' style operation, push-in suction cups. The ample, finger-sculpted pistol grip handle comes armed with large contour-fitted thumb and trigger snap-action buttons. Only the thumb button is duplicated on the case, via left and right non-snap keys placed near the forward (cord) end.

Turning the unit over, you will find the expected Apple/IBM selector plus two additional slide switches. One lets the user assign trigger and thumb switch outputs — for example, Apple's PBO can go to the trigger with PB1 routed to the thumb button, or vice-versa. The remaining switch activates Analog Plus's special "Rapid Fire" function.

When Rapid Fire is 'ON' a player need only squeeze and hold the trigger to produce a steady stream of stick-generated button presses. You set the rate — from 2/second up to 100/second — using a slide control placed near the handle. When a game gives the player just one shot (hit, stab, etc.) per press — sword fighting in Micro Prose's "Pirates" is a good example — Rapid Fire can confer an awesome advantage. Naturally, automated triggering is no help in games with built-in rapid fire routines. A 'machine gun' shoots just so fast no matter how rapidly you pump the trigger.

Beyond question, Analog Plus's most significant 'feature' is the substitution of pressure sensors for the potentiometers employed in other analog sticks. Inside the case, four arms extend out from the handle shaft. On each arm is a rubber foot which, when the stick is centered, rests 1 gm. (gnat's eyebrow) above a pressure sensor. Moving the handle off center changes the pressure on one or more sensors, producing changes in resistance at the horizontal and/or vertical outputs. Centering tension comes from two sources. The rubber core of the handle (bolted to a board inside the case) resists stretching; and the rubber feet resist compression. To set center values, Analog Plus employs two slide pots adjusted via side-mounted tabs. Moving the tabs isn't easy, which makes the adjustment more difficult than on most sticks; but you do get plenty of range — enough, for example, to allow accelerated-speed play of "Elite" on a II+.

Since the sensors are physically just strips pasted onto the stick's printed circuit board, the up-front benefits of Suncom's approach are extraordinary ruggedness and freedom from wear. During play, the ONLY 'moving part' is the handle! Centering error is virtually eliminated.

Both Analog Plus and its predecessor, Starfighter, do exhibit rather high centering tension; and, unlike spring-loaded units, tension increases significantly (to approximately 1400 gm.) as you approach the limits of handle travel. Predictably, when I first tested Starfighter a couple years ago, users consistently appreciated its smooth, tough feel; but, after a few minutes of high-action play, expressed a preference for one of the lighter tension sticks. Handheld and boasting a short, smooth handle, the original pressure sensor model is fine for 'switcher stick' games like "Conan", especially if you ARE Conan!

Suncom's response has been to give Analog Plus a molded pistol grip and longer handle plus a larger base you can anchor (via the suction cup feet) to any smooth surface. Stick tension remains high, but, thanks to the 'strength multiplier' effects of the new design, not too high for most game players. Still, this IS a dedicated 'battle controller' (i.e. not the 'stick of choice' for adventure game pointer applications). In 'acid test' tryouts with "Elite", "The Duel", and "Tomahawk", Analog Plus proved entirely usable as a true, X-Y positioning, analog joystick so long as suction cup anchoring was available. (Analog Plus NEEDS its suction anchoring.) Freeing the second hand, of course, is more than a solid comfort plus. In the newer action game releases, which, increasingly, require some in-play keyboard and/or mouse inputs, it is a feature which can decisively enhance performance.

As with sports cars, tennis rackets, and mouse pads, among better quality sticks, 'goodness of feel' evaluations are always somewhat subjective. Thus, while I find Analog Plus a bit mushy and would prefer more 'click' and less 'clack' in its heavy-duty handle buttons, some users will turn on to its "cushioned touch" and "realistic command response". No one, however, is going to argue much about the case-mounted button. Given a perfectly good in-handle thumb switch, this hard action no-snap add-on, with its rocking motion — the "left and right" keys are actually a single piece — is pure "donzel", good for decoration only.

One important, reasonably objective feel criterion is "feedback" (i.e. how well the stick communicates its X,Y outputs to the user via feel). Good feedback makes it easier to master high-action controls and reduces stress, since you can more accurately adjust your command outputs without having to depend solely upon game-generated displays and sound. Here, Analog Plus's absolute lack of 'centering bump', present in every spring-loaded joystick, has to rate as a minus. In games, moving through center is always an important 'event'; some bump is desirable. Like all

full-hand grip sticks, the Suncom unit supplies plenty of stick-angle feedback as it is moved to and from extreme positions; UNLIKE most competitors, it also exhibits a solid, discernible change in tension. Analog Plus knows that, whether it's a sports car, jet fighter, or space ship, 'more means harder'; it lets you FEEL those hairpin turns and power dives.

With Analog Plus, joystick pressure sensor technology has come of age. Offering 'first-strike' indestructibility, one-handed command console operation, and 'mean' good looks, Suncom's new battle stick represents a credible bid for the hearts, minds, and trigger fingers of serious Apple/IBM action gamers.

FAST FRAMES, UPDATES, ETC.

Exploring Fractals ★★

As explained in the booklet which accompanies Eclat's "Fractal Explorer" (\$39.95, for 512K IIGs), many natural objects, like trees and snowflakes have fractal (i.e. "fragmented") shapes. These are produced by repeated recursive application of surprisingly simple rules. (i.e. The output of application N becomes the input for application N+1, etc..) What Eclat's package does is to let you experiment with a different kind of fractal pattern, the Mandelbrot Set and its close associate, the Julia Set. "Explorer" not only generates the familiar paisley pattern in full-color 320 mode super-res, but also allows blow-ups of any 1/64 screen section (and blow-ups of blow-ups) via a movable zoom box. To set the initialization point for generating a Julia Set pattern, you use a pointer into a Mandelbrot screen. Since producing colorful attractive pictures is much of the fun, the program lets you change palettes and try out color XOR and color compliment effects on the current screen, even while the picture is forming.

"While the picture is forming?!" Indeed, the classic barrier to home computer Mandelbrot Set explorations is the time it takes to generate the patterns. Even with machine code routines to handle the calculations, you can expect waits ranging from two or three, up to ten or twenty hours per screen, depending upon zoom level. "Explorer" permits saving both in-process screens (for later recall and completion) and completed pictures. The pictures are standard \$C1 files for easy transfer to your favorite painter utility and/or presentation via the on-disk Slide Show program. (Also on the diskette are several example pictures.)

Though "exploration" necessarily becomes an inconveniently long-term endeavor, more bothersome weaknesses are a sketchy manual and lack of any provision to present user-inputted "regular fractals" (It's hard to complain much about speed until I see someone else do the same thing faster. Mandelbrot-wise, this is the 'only game in town'.) "Explorer"'s outputs, especially blow-ups of border regions, make very interesting, attractive printouts; and, if you need "original artwork" to embellish some design (e.g. on a tee-shirt), the program is a gold mine. ("Fractal Explorer" comes in a handsome soft plastic case. A II+/IIe package with 64K hires and 128K double-hires programs is also available.)

Keep-It-Simple Upgrade

If the best Apple can do for its II line turns out to be a "new IIGs" with 1MB of motherboard RAM and 128K of sound RAM plus NO upgrade offer to current IIGs owners... Well, the next "Apple Fest" could turn into the first "Apple Frost". As to movement on the 'II manufacturers upgrade front', I have yet to here a peep from Applied Engineering, Comlog, Western Design Center, or anyone else in the business. (Like, where are the Japanese when you really need them?!)

So, to get things rolling, here's a specific proposal: Since the big problem with any worthwhile upgrade is maintaining current compatibilities while extracting graphics control and output from the motherboard kluge, why not put everything on a single, slot-pluggable board which also plugs into the motherboard 65816 socket? "Everything" includes an 8-10 MHz 65816, cache RAM, 640 x 400 (at least) x 256 colors graphics controller, an input (via a short jumper chord) from 'old graphics' output, video output & switching circuitry, ROM's, 1MB of RAM, duplicate sound system with 256K RAM, sound input for 'old sound' output (via another jumper chord), and a mini-connector to drive a 'to be developed' improved disk interface. The board amounts to a vastly improved IIGs which can, when asked, take over the motherboard and work like the old machine — NOT, to be sure, so dramatic an approach as some might wish; but then, the idea is to 'keep it simple'.

Video Productions ★★

One of the better kept secrets in II Land has to be the ease with which any on-screen image can be transferred to video tape. Just connect the computer's composite output to a VCR (or camcorder) Video Input, set the VCR to accept external video, and 'record when ready'.

In Epyx's "Home Video Producer" (\$49.95, for 128K Apple II) you have a set of tools which can greatly simplify the production of not just single-screen 'slides', but entire double-hires text/graphics sequences including backgrounds, moving

figures, text in various fonts, and 'special effects' screen wipes and scrolls. These "Movies" are great for adding titles, dates, locale info, greeting messages, or whatever to your video tapes. Each movie is constructed from one or more 16-frame "strips" (32 frames on IBM) and can have a run time of just a few seconds up to minutes. You can save all creations (as strips and/or movies) on diskette. To add a movie to tape, you "Play" it under HVP control while recording the Video Output of your computer. (Note: Add-on movies work best when placed on tape BEFORE the material which follows is taped.)

Everything in the HVP package, from the illustrated 45-page manual to on-diskette artwork and thoroughly prompted "Print-Shop"-type screens is aimed at making movie production easy, while offering the necessary flexibility. Basically, HVP turns your computer into a 'Studio Production & Cutting Room' with all of the expected cut, paste, duplicate, run/rerun, timing control, and similar capabilities. Several backgrounds, 75 full-color paste-on graphics, eight borders, and ten fonts, along with ten ready-to-customize movies are included in the two-diskette package (copyable to 3.5" media). Of course, your own creations (e.g. from "816 Paint") will work too. Fun to use, yet practical, "Home Video Producer" is a video taping 'pizazz machine'.

Moving Madness ★★

Second in Spectrum's 'International Puzzles' series, "Soko-Ban" (\$29.95, for 128K Apple II) puts you in the role of a warehouse worker whose task in some fifty on-diskette puzzles is to move several crates to marked storage areas before time expires. Since you can move a crate only by pushing, and can move just one crate at a time, what may seem a trivial challenge can turn out to be fairly involved. (For example, if you push a crate into a corner, it had better be a storage square.) Each puzzle fits in a single double-hires screen showing the timer and a top-down view of your worker figure and the crates in a multi-room maze.

Like Spectrum's "Tetris", "Soko-Ban" both tests and teaches. Whereas the fast-paced "Tetris" emphasizes spatial relations; "Soko-Ban" is a rather leisurely challenge to visualization and planning skills. (The timer is chiefly for deriving scores, which ARE saved to disk. Actual 'time pressure' is minimal.) Working through the puzzles in numerical order, I did, in fact, find that solutions suddenly seemed to drop into place, despite increasingly complex arrangements. Too easy? Not hardly; some setups may require a minute or more of study before a single crate is moved. Fun? Definitely! A nice addition is an editor for designing your own puzzles, which can be saved (through #99) on disk. You will have to put up with a silly, cumbersome startup sequence; but, once into the puzzles, "Soko-Ban" is a remarkably absorbing experience.

Light in the Realms

Having polished off the first batch of quests in SSI's "Realms of Darkness", your stalwart band is stymied. You know that a "Rogue Alliance" is stirring up trouble; but no one in Badel is handing out nice specific assignments. Then one day, in a desolate region just north of the city, your scout stumbles upon a hidden cave! Following a trail marked by flickering neon arrows you arrive at a brightly lit grotto in the center of which is a huge stone statue. At its feet a sign reads: "Ye Olde Computist's Oracle. Cross my palm with silver." Figuring that ANY chance to end your aimless wandering is worth taking, you ployp the party's last silver denar into the figure's extended hand.

With a horrendous groan the golem closes its fist upon the coin and begins to speak in a deep rumbling voice:

"Questless in Badel? Not at all! To destroy the Rogue Alliance is the call.

First, three quests for Shapes. Then, on the Star, a spell is bound; and teleport to another ground.

One maze here? Yes, but toggles too. Enter a room past Gertrude's sign and map Level two a second time!

Back to Badel, then North and down you pursue the Bones of Dragon.

The Eight-legged Guardian passes just one. Pull, stone grinds, and the way is done.

Rejoined and confused? A new doorway is used! Down a long corridor, past many alcoves you lead; and a mapper says "Aha! 'Bones' indeed!"

First, a hero's treasure; then East to take your magic's measure. Against a Rogues army second to none, Reflect early and Realms' greatest quest is won!"

VENDORS

Advanced Gravis Computer Technology: 7033 Antrim Ave., Burnaby BC, Canada V5J 4M5 (604-434-7274, in USA call 800-663-8558)

Eclat: P.O. Box 570-756, Miami, FL 33257-0756 (305-233-4666)

Epyx: 600 Galveston Drive, P.O. Box 8020, Redwood City, CA 94063 (415-366-0606)

Software Toolworks: 19808 Nordhoff Place, Chatsworth, CA 91311 (818-885-9000)

Spectrum-Holobyte: 2061 Challenger Dr., Alameda, CA 94501

Fred G. Brooks

Advanced Playing Technique for... **Might and Magic II** *Activision*

Requirements:

Apple IIe or IIc (128k required)
 A backup of MM II disk B
 A sector editor (I used Copy II+)

MM II is an excellent follow-on to the original MM. You need not have played MM I to play MM II. The graphics are excellent, and are substantially better than MM I. Most importantly to those of us who hate to map, the automapping feature is superb (much better than Bard's Tale III).

In developing the APT and the Item List, I have tried to follow the format of Les Minaker in COMPUTIST #58.

A major difference between MM I and MM II is the use of NPCs called "Hirelings". All characters, both player-controlled (PCCs) and Hirelings (NPCs), are located on tracks \$01 and \$02. Also, there are exactly two characters per sector, with all information starting at the same byte. This greatly simplifies character editing. The following list gives the byte of both characters on each sector. By the way, the NPCs can be edited, but they are not available until you visit their square in the game and "turn them on".

MMII Character Attributes

Byte	Attribute
00,80	List position
01,81	Town Location (01-05 for PCCs, 81-85 for NPCs)
02-0B,82-8B	Name
0C,8C	Sex — 00-male, 01-female, 02-neuter
0D,8D	Alignment — 00-good, 01-neutral, 02-evil
0E,8E	Race — 00-human, 01-elf, 02-dwarf, 03-gnome, 04-halforc
0F,8F	Class — 00-knight, 01-paladin, 02-archer, 03-cleric, 04-sorcerer, 05-robber, 06-ninja, 07-barbarian
10,90	Might now
11,91	Intelligence now
12,92	Personality now
13,93	Speed now
14,94	Accuracy now
15,95	Luck now
16,96	Magic resistance
17,97	Fire resistance
18,98	Electricity resistance
19,99	Cold resistance
1A,9A	Energy resistance
1B,9B	Sleep resistance
1C,9C	Poison resistance
1D,9D	Acid resistance
1E,9E	Thievery %
1F,9F	???
20-21,A0-A1	Hit points, current maximum allowable
22,A2	Might base
23,A3	Speed base
24,A4	Accuracy base
25,A5	Alignment base
26,A6	Level now
27,A7	Spell level now
28-29,A8-A9	Spell points now
2A,AA	Endurance now
2B,AB	Intelligence base
2C,AC	Personality base
2D,AD	Luck base
2E,AE	Level base
2F,AF	Age
30-34,B0-B4	Experience (in reverse order)
35-36,B5-B6	Spell points
37,B7	Spell level base
38-39,B8-B9	Gems (in reverse order)
3A-3B,BA-BB	Hit points actual now
3C-3D,BC-BD	Hit points current maximum
3E-40,BE-C0	Gold (for PCCs) or Cost (for Hirelings) (in reverse order)
41,C1	Armor class
42,C2	Food
43,C3	Condition (00 is Good)
44,C4	Endurance base
45-4A,C5-CA	Carried items
4B-50,CB-D0	Backpack items
51-56,D1-D6	Magic charges of carried items (FF=255 is maximum)
57-5C,D7-DC	Magic charges of backpack items (FF=255 is maximum)
5D-62,DD-E2	+ of carried items (Cx=neutral, 8x=good,

4x=evil, 0x=anyone - alignment restrictions)
 63-68,E3-E8 + of backpack items (Cx=neutral, 8x=good, 4x=evil, 0x=anyone - alignment restrictions)
 69-6D,E9-ED ???
 6E-73,EE-F3 Spell knowledge (FF in each byte means all spells known)
 74,F4 Class quest complete PPC 7F=no, FF=yes, NPC 00=no, 80 or 81=yes
 75-7F,F5-FF ???

MMII Equipment List

Byte	Item	Equip Bonus	Spell
00	Nothing	none	none
01	Small Club	none	none
02	Small Knife	none	none
03	Large Club	none	none
04	Dagger	none	none
05	Large Knife	none	none
06	Hand Axe	none	none
07	Cudgel	none	none
08	Spiked Club	none	none
09	Bull Whip	none	none
0A	Long Dagger	none	none
0B	Maul	none	none
0C	Short Sword	none	none
0D	Nunchakas	none	none
0E	Mace	none	none
0F	Spear	none	none
10	Cutlass	none	none
11	Flail	none	none
12	Sabre	none	none
13	Long Sword	none	none
14	Wakizashi	none	none
15	Scimitar	none	none
16	Battle Axe	none	none
17	Broad Sword	none	none
18	Katana	none	none
19	Slumber Club	Sleep + 15	S 1-7
1A	Power Club	Might + 3	none
1B	Lucky Knife	Luck + 10	none
1C	Looter Knife	Thief + 15	none
1D	Power Cudgel	Might + 3	none
1E	Energy Whip	none	S 1-3
1F	Sonic Whip	Poison + 15	C 2-4
20	Mighty Whip	Might + 3	none
21	Scorch Maul	Fire + 15	none
22	Mauler Mace	Might + 6	none
23	Exacto Spear	Accuracy + 6	none
24	Fiery Spear	Fire + 15	S 4-3
25	Fast Cutlass	Speed + 4	none
26	Quick Flail	Speed + 6	none
27	Shock Flail	Electricity + 15	S 2-2
28	Sharp Sabre	Accuracy + 5	none
29	Ego Scimitar	Personality + 12	none
2A	True Axe	Accuracy + 5	none
2B	Blazing Axe	Fire + 15	none
2C	Electric Axe	Electricity + 15	S 3-4
2D	Rapid Katana	Speed + 6	none
2E	Accurate Sword	Accuracy + 10	none
2F	Chance Sword	Luck + 15	none
30	Speedy Sword	Speed + 10	none
31	Flash Sword	Energy + 15	S 3-4
32	Flaming Sword	Fire + 15	S 4-3
33	Electric Sword	Electricity + 15	S 6-5
34	Acidic Sword	Acid + 15	S 3-1
35	Cold Blade	Cold + 15	S 4-1
36	Sage Dagger	Intelligence + 15	Level + 15
37	Holy Cudgel	Personality + 15	C 9-2
38	Divine Mace	Armor + 10	C 9-1
39	Ice Scimitar	Cold + 15	S 6-3
3A	Grand Axe	Might + 15	none
3B	Swift Axe	Speed + 15	none
3C	Dyno Katana	Electricity + 15	Level + 15
3D	Force Sword	Might + 15	none
3E	Magic Sword	Magic + 15	Level + 15
3F	Thunder Sword	Might + 15	S 3-4
40	Energy Blade	Energy + 15	S 6-1
41	Photon Blade	Might + 15	S 9-1
42	Staff	none	none
43	Sickle	none	none
44	Scythe	none	none
45	Glaive	none	none
46	War Hammer	none	none
47	Trident	none	none
48	Pike	none	none
49	Naginata	none	none
4A	Bardiche	none	none
4B	Great Hammer	none	none
4C	Halberd	none	none
4D	Great Axe	none	none
4E	Flamberge	none	none
4F	Wind Staff	Speed + 5	C 5-1
50	Tri Sickle	none	none
51	Ice Sickle	Cold + 15	S 4-1
52	Fire Glaive	Fire + 15	S 4-3
53	Harsh Hammer	Might + 3	none
54	Stone Hammer	Magic + 15	none
55	Genius Staff	Intelligence + 10	Level + 15
56	Wizard Staff	Intelligence + 15	S 7-4
57	Soul Scythe	Magic + 15	S 5-2
58	Dark Trident	Armor + 5	none
59	Titan's Pike	Might + 15	Might + 15
5A	Moon Halberd	Luck + 15	C 7-3
5B	Sun Naginata	Armor + 10	Level + 15
5C	Blowpipe	none	none
5D	Sling	none	none
5E	Short Bow	none	none
5F	Cross Bow	none	none
60	Long Bow	none	none
61	Great Bow	none	none
62	Shaman Pipe	Magic + 10	Spell Lvl + 1
63	Cinder Pipe	Fire + 10	S 4-3
64	Quiet Sling	Sleep + 15	C 2-6
65	Pirate's X-Bow	Thief + 10	Accuracy + 15
66	Burning X-Bow	Fire + 10	C 3-5
67	Fireball Bow	Fire + 15	S 4-3
68	Voltage Bow	Electricity + 10	S 3-4
69	Giant Sling	Poison + 15	Might + 15
6A	Energy Sling	Energy + 15	S 1-3
6B	Death Bow	Luck + 15	Level + 15
6C	Star Bow	Energy + 15	S 9-3
6D	Meteor Bow	Armor + 5	S 8-3
6E	Ancient Bow	Accuracy + 15	Accuracy + 15
6F	Green Key	none	none
70	Yellow Key	none	none
71	Red Key	none	none
72	Black Key	none	none
73	Small Shield	Armor + 1	none
74	Large Shield	Armor + 2	none
75	Great Shield	Armor + 3	none
76	Fire Shield	Armor + 3, Fire + 15	none
77	Electric Shield	Armor + 3, Elec + 15	none
78	Acid Shield	Armor + 3, Acid + 15	none
79	Cold Shield	Armor + 3, Cold + 15	none
7A	Silver Shield	Armor + 3, Energy + 15	none
7B	Bronze Shield	Armor + 3, Poison + 15	none
7C	Iron Shield	Armor + 3, Sleep + 15	none
7D	Magic Shield	Armor + 5, Magic + 15	none
7E	Gold Shield	Armor + 7, Luck + 15	none
7F	Padded Armor	Armor + 2	none
80	Leather Armor	Armor + 3	none
81	Scale Armor	Armor + 4	none
82	Ring Mail	Armor + 5	none
83	Chain Mail	Armor + 6	none
84	Splint Mail	Armor + 7	none
85	Plate Mail	Armor + 8	none
86	Plate Armor	Armor + 10	none
87	I Scale Mail	Armor + 4, Sleep + 15	none
88	B Scale Mail	Armor + 4, Poison + 15	none
89	S Scale Mail	Armor + 4, Energy + 15	none
8A	I Ring Mail	Armor + 5, Sleep + 15	none
8B	B Ring Mail	Armor + 5, Poison + 15	none
8C	S Ring Mail	Armor + 5, Energy + 15	none
8D	I Chain Mail	Armor + 6, Sleep + 15	none
8E	B Chain Mail	Armor + 6, Poison + 15	none
8F	S Chain Mail	Armor + 6, Energy + 15	none
90	I Splint Mail	Armor + 7, Sleep + 15	none
91	B Splint Mail	Armor + 7, Poison + 15	none
92	S Splint Mail	Armor + 7, Energy + 15	none
93	I Plate Mail	Armor + 8, Sleep + 15	none
94	B Plate Mail	Armor + 8, Poison + 15	none
95	S Plate Mail	Armor + 8, Energy + 15	none
96	G Scale Mail	Armor + 6, Luck + 15	Level + 10
97	G Ring Mail	Armor + 7, Luck + 15	Level + 10
98	G Chain Mail	Armor + 8, Luck + 15	Level + 10
99	G Splint Mail	Armor + 9, Luck + 15	Level + 12
9A	G Plate Mail	Armor + 12, Luck + 15	Level + 15
9B	Helm	Armor + 1	none
9C	I Helm	Armor + 2, Sleep + 15	none
9D	B Helm	Armor + 2, Poison + 15	none
9E	S Helm	Armor + 3, Energy + 15	none
9F	G Helm	Armor + 4, Luck + 15	Level + 15
A0	Magic Herbs	none	C 1-4
A1	Torch	none	none
A2	Lantern	none	none
A3	Thief's Pick	Thief + 15	none
A4	Rope N Hooks	none	S 2-4
A5	Wakeup Horn	none	S 1-1
A6	Compass	none	S 1-6
A7	Sextant	none	S 1-6
A8	Force Potion	none	Max HP+10
A9	Skill Potion	none	Level + 5
AA	Max HP Potion	none	Max HP+2
AB	Holy Charm	none	C 1-7
AC	Herbal Patch	none	C 2-1

AD	Hero Medal	Personality + 4	E 2-2
AE	Silent Horn	none	C 2-6
AF	Magic Meal	none	C 2-3
B0	Antidote Ale	none	C 3-3
B1	Super Flare	none	C 3-5
B2	Dove's Blood	none	C 4-3
B3	Ray Gun	Accuracy + 5	S 1-3
B4	Magic Charm	none	S 2-7
B5	Witch Broom	none	S 3-2
B6	Invisocloak	Armor + 6	S 3-3
B7	Storm Wand	Electricity + 10	S 3-4
B8	Lava Grenade	none	S 4-3
B9	Hourglass	none	S 4-6
BA	Instant Keep	none	S 5-4
BB	Teleport Orb	none	S 5-5
BC	Skeleton Key	Thief + 10	none
BD	Defense Ring	Armor + 2	S 4-5
BE	Might Gauntlet	Might + 6	Might + 10
BF	Accuracy Gauntlet	Accuracy + 6	Accuracy + 10
C0	Stealth Cape	Thief + 10	Speed + 15
C1	Admit 8 Pass	none	none
C2	Speed Boots	Speed + 15	C 5-3
C3	Cureall Wand	Poison + 15	C 5-5
C4	Moon Rock	none	C 7-3
C5	Ruby Ankh	Luck + 10	C 7-4
C6	Disruptor	Energy + 15	S 5-1
C7	Lich Hand	none	S 5-2
C8	Phaser	Accuracy + 1	S 6-1
C9	Freeze Wand	Cold + 15	S 6-3
CA	Energizer	none	S 6-4
CB	Magic Mirror	none	S 7-2
CC	Elven Cloak	Armor + 5	S 3-3
CD	Elven Boots	Speed + 5	none
CE	Sage Robe	Intelligence + 6	Level + 10
CF	Enchanted Id	Personality + 15	Level + 15
D0	Green Ticket	none	none
D1	Yellow Ticket	none	none
D2	Red Ticket	none	none
D3	Black Ticket	none	none
D4	Fe Farthing	none	none
D5	Castle Key	Thief + 5	none
D6	Mark's Keys	none	none
D7	Dog Whistle	Luck + 1	S 4-4
D8	Web Caster	none	S 3-5
D9	Monster Tome	none	S 2-3
DA	Cupie Doll	none	none
DB	Water Talon	none	C 6-4
DC	Air Talon	none	C 5-1
DD	Fire Talon	none	C 8-1
DE	Earth Talon	none	C 7-1
DF	Element Orb	none	S 9-3
E0	Gold Goblet	none	none
E1	+7 Loincloth	Personality + 10	none
E2	Valor Sword	none	none
E3	Honor Sword	none	none
E4	Noble Sword	none	none
E5	Corak's Soul	none	none
E6	Emerald Ring	Armor + 15	none
E7	Water Disc	none	C 6-5
E8	Air Disc	none	C 4-2
E9	Fire Disc	none	C 8-2
EA	Earth Disc	none	C 6-1
EB	Sapphire Pin	Luck + 15	none
EC	Amethyst Box	Luck + 15	none
ED	Coral Broach	Might + 15	none
EE	Lapis Scarab	Might + 15	none
EF	Amber Skull	Intelligence + 15	none
F0	Quartz Skull	Intelligence + 15	none
F1	Agate Grail	Personality + 15	none
F2	Opal Pendant	Might + 15	none
F3	Crystal Vial	Speed + 15	none
F4	Ruby Amulet	Luck + 15	none
F5	Ivory Cameo	Might + 15	none
F6	Ruby Tiara	Accuracy + 15	none
F7	Onyx Effigy	Personality + 15	none
F8	Pearl Choker	Personality + 15	none
F9	Topaz Shard	Accuracy + 15	none
FA	Sun Crown	Intelligence + 15	none
FB	J-26 Fluxer	none	none
FC	M-27 Radicon	none	none
FD	A-1 Todilor	none	none
FE	N-19 Capitor	none	none
FF	Useless Item	none	none

Key Elements

A key element in the game is that Queen Lamanda will not talk to you until your party has become "triple crown" winners. You must get three Black Tickets in Town 2, visit the arena in Towns 1, 2, and 5 (win of course), have each party member have their individual mark (+), and then visit the Queen. She will designate the first character in your party as the Chosen One. Remember: the Green and Yellow tickets won't do, only the Black ticket.

Any character can cast spells with an item that has spell

casting ability. Furthermore, the item can be in the character's backpack. For example, my Thief had a Photon Blade in his backpack, and could use it to cast spell S 9-1. Be sure that every character has at least one item with offensive spell casting ability.

Be sure to visit every square in the non-Castle dungeons, as the key messages are found there.

Bill Jetzer

Notes on Softkey for Animate

My Animate softkey (COMPUTIST #54), is for version 1.00 from late 1986. I see no reason why my softkey shouldn't work for Bob Igo, but here is an explanation of the protection.

Animate uses the Prolok protection scheme on both sides of the disk. In addition, the front side checks location \$BF43 to make sure it is the proper value (the series of "Prolok bytes" is read into that area of memory) and the back side has a checksum routine to make sure nobody has been fooling with the Prolok routine.

On the front side, the beginning of the protection routine looks like this. On my disk, it starts at track \$0, sector \$2 at byte \$BC:

```
BC- AD FF 8A LDA $8AFF ;Might be different address
BF- 29 7F AND #$7F
C1- 8D D5 81 STA $81D5 ;Ditto
C4- 85 2B STA $2B
C6- 20 00 BF JSR $BF00
```

Search your disk for these bytes and change the first two to 18 60. On my disk, the routine to check that Prolok has loaded in the correct bytes starts at track \$7, sector \$0, at byte \$D1 and looks like this:

```
D1- AD 43 BF LDA $BF43
D4- C9 FC CMP #$FC
D6- F0 05 BEQ $xxDD
```

Search your disk for these bytes and change the branch statement at \$D6 from a F0 to a D0.

The beginning of the routine on the back looks like this. On my disk, it starts at track \$1, sector \$1, byte

```
A6- AD 30 BF LDA $BF30
A9- 8D 9E 6F STA $6F9E ;Might be different address
AC- 29 70 AND #$70
AE- 85 2B STA $2B
```

Search your disk for these bytes and change the first two to 18 60. The checksum routine looks like this. On my disk it starts at track \$F, sector \$B, position \$20:

```
20- 18 CLC
21- A0 F7 LDY #$F7
23- A9 00 LDA #$00
25- 79 A5 6E ADC $6EA5,Y ;Address might differ
28- 4C 95 70 EOR $7095 ;Ditto
2B- 49 90 EOR #$90
2D- 88 DEY
2E- D0 F5 BNE $xx25
30- C9 FB CMP #$FB
32- F0 05 BEQ $xx39
```

Search your disk for these bytes and change the branch at \$32 from F0 to D0. Those are the only routines I found, so that should take care of it

Jack R. Nissel

Playing with ProDOS

Modifying a 3.5 disk for more useable blocks

Have you ever been copying files to a 3.5 disk only to run out of room before you run out of files? If so, this modification is for you.

Depending on what you want, you can free up 1, 2, or 3 blocks on your ProDOS based 3.5 disk. I have tried this patch and it works for bootable disks and non-bootable data disks. The only limitations are that the more blocks you want free, the less files your disk can hold in the volume directory. (An unmodified ProDOS disk allows 51 files in the volume directory). It does not limit the number of sub-directories you can have as long as the number of files in the main one is not exceeded.

To modify your disk make the following sector edits. I will explain at the end of this article what the sector edits do.

To free up 1 block do the following. You will be limited to 38 files in the volume directory.

1. Read block \$0006
2. Change byte \$00 from 01 to 03
3. Write this block back to \$0005 (not \$0006)
4. Read block \$0002
5. Change byte \$27 from 06 to 05
6. Write this block back to \$0002
7. Read block \$0004
8. Change byte \$02 from 05 to 00

9. Write this block back to \$0004
10. Read block \$0007
11. Write this block back to \$0006

To free up 2 blocks do the following. You will be limited to 25 files in the volume directory.

1. Read block \$0006
2. Change byte \$00 from 01 to 07
3. Write this block back to \$0004 (not \$0006)
4. Read block \$0002
5. Change byte \$27 from 06 to 04
6. Write this block back to \$0002
7. Read block \$0003
8. Change byte \$02 from 04 to 00
9. Write this block back to \$0003
10. Read block \$0007
11. Write this block back to \$0006

To free up 3 blocks do the following. You will be limited to 12 files in the volume directory.

1. Read block \$0006
2. Change byte \$00 from 01 to 0F
3. Write this block back to \$0003 (not \$0006)
4. Read block \$0002
5. Change byte \$27 from 06 to 03
6. Change byte \$02 from 03 to 00
7. Write this block back to \$0002
8. Read block \$0007
9. Write this block back to \$0006

The Explanation

Normal ProDOS on a 3.5 disk saves blocks \$0002, \$0003, \$0004, & \$0005 for the volume directory file names. So if we are willing to live with less files in the volume directory we can use blocks \$0003, \$0004, & \$0005 for storage. We must keep block \$0002 for the volume directory must start at block \$0002.

The first sector edit is to block \$0006. Block \$0006 is the bit map. Byte 00, which contains an 01, is represented in binary as 0 0 1. In the bit map the 0's stand for blocks in use, the 1's stand for free blocks. Changing the 01 to an 03 now is represented in binary as 0 0 1 1, since there is now an additional 1 this frees up 1 more block. If we change it to an 07 it would be shown in binary as 0 1 1 1. Again an additional 1 and another free block. Changing it to an 0F, which is the hex equivalent of decimal, 15 would be shown in binary as 1 1 1 1. This gives us another free block. (NOTE... Each of the FF's on the bit map represent free blocks.) When we change the byte and write block \$0006 to block \$0005 we are freeing up \$0006. If we write it to \$0004 we free up blocks \$0005 & \$0006, and if we write it to \$0003 we are freeing up \$0004, \$0005, & \$0006. This is a far back as we can move the bit map since blocks \$0000, \$0001, & \$0002 are needed.

The second sector edit is to block \$0002. On block \$0002 byte 27 shows what block the bit map is on. Normally it on block \$0006, so you will find an 06 there. If we move the bit map to \$0005 we have to change the 06 to an 05 so that the volume directory will know where the bit map is. If we move the bit map to \$0004, or \$0003 we must make the appropriate change to byte 27.

The third sector edit, to byte 02, what ever block it is on, is to let it be known that this is the last block in the volume directory. On an unmodified disk this byte on block \$0002 will be an 03 which means look on block \$0003 to see if there are any more files. On \$0003 this byte is an 04 which means look on block \$0004 for more files and on \$0004 this byte is an 05 which means look on block \$0005. On block \$0005 you will find an 00. This means that this is the last block for files in the volume directory. So when we move the bit map back 1, 2, or 3 blocks we must end the search for files on the block before the bit map block.

The forth sector edit, writing block \$0007 to \$0006, is not really needed. I have done it simply to zero out the old bit map.

Note: When deleting files from this disk use the delete file option instead of the delete disk option, (this is when using Copy][Plus, I have not tried other programs). If you use the delete disk option the disk will be set back to a normal 3.5" disk without the extra free blocks.

Softkey for...

Math Man

Scholastic

To deprotect this title we will use the RWTS of the protected disk, with Demuffin Plus to copy the files from the original disk then write them back to your blank disk.

Requirements:

- Original disk
- A blank disk
- Demuffin Plus
- DOS 3.3 system master
- A way to reset into the monitor

1. Boot your DOS 3.3 system disk and at the Applesoft prompt enter:

CALL-151 (gets you into the monitor)
 9E42:14 (changes RUN command to EXEC)
 INT LOADER
 DELETE LOADER.

2. Boot your original disk and reset into the monitor after the first 3 tracks are read.

3. Move the RWTS to a safe place, so it won't be destroyed when you boot your slave disk, by entering:
 6800<B800.BFFF

4. Boot your slave disk
 C600G

5. Put in your Demuffin Plus disk and enter
 CALL-151
 BLOAD DEMUFFIN PLUS,A\$803
 FF59G (if you hear a beep ignore it)
 B800<6800.6FFF (moves the protected RWTS back to its original location)

A851G (reconnects DOS)
 803G (starts Demuffin Plus)

5. Put your original disk in and copy all of the files to your blank initialized disk. When asked to put in a file name enter = and when asked if you want prompting answer N.

Softkey for...

**Lantern of D'gamma
 Islands of Beta
 Milliken Mathfun Golf Classic
 Battling Bugs**
 Milliken Publishing

Requirements:

The original program disk for each title
 A blank disk for each title
 COPYA from your DOS 3.3 system master
 A sector editor

1. Boot your DOS 3.3 System Master disk and at the Applesoft prompt enter:
 POKE 47426,24 (ignore checksum and epilogues)
 RUN COPYA

2. Copy your original disk to your blank disk.
 3. Make the following sector edits to your copy.

Trk	Sct	Byte	From	To
\$11	\$00	\$00-01	A0 F1	04 11

4. Write the sector back to the disk.

Softkey for...

Magic Spells
 Learning Well

Requirements:

The original disk
 A blank disk
 A sector editor
 Any fast copy program

The softkey in issue #53 by UNK from Erie would not work for my version. The bytes were the same except for one byte and I had to get rid of the BEQ instruction completely.

1. Fast copy the original disk to your blank disk.
 2. Make the following sector edit.

Trk	Sct	Byte	From	To
14	00	B0-B4	98 F0 FE A9	98 EA EA A9

3. Write the sector back to the disk.

Softkey for...

Isle of Mem
 Grolier Software

Requirements:

The original disk
 2 blank sides
 A sector editor
 Any fast copy program

The softkey in COMPUTIST 24 did not work for my copy. If it didn't work for yours either, try the following.

1. Fast copy both sides of your original to your blank disks.
 2. Make the following sector edit to side 1 of your copy.

Trk	Sct	Byte	From	To
\$1F	\$0E	\$3B	BD	60

3. Make the following sector edits to side 2 of your copy.

Trk	Sct	Byte	From	To
\$1D	\$0A	\$29	BD	60
\$21	\$0C	\$2D	BD	60

4. Write each sector back to the disk before going on to the next sector.

Softkey for...

Great Book Search
 Grolier Software

Requirements:

The original disk
 2 blank sides
 A sector editor
 Any fast copy program

1. Fast copy both sides of your original to your blank disks.
 2. Make the following sector edits to side 1 of your copy.

Trk	Sct	Byte	From	To
\$22	\$04	\$03	BD	60
	\$05	\$E5	BD	60

4. Write each sector back to the disk before going on to the next sector.

Softkey for...

Easy Graph
 Grolier Software

Requirements:

The original disk
 A blank disk
 A sector editor
 Any fast copy program

1. Fast copy your original to your blank disk.
 2. Make the following sector edits to your copy.

Trk	Sct	Byte	From	To
\$15	\$05	\$1B	BD	60
\$1A	\$0F	\$F7	BD	60
\$1B	\$00	\$09	BD	60

4. Write each sector back to the disk before going on to the next sector.

Softkey for...

**Shutterbug's Patterns
 Shutterbug's Pictures
 Lion's Work Shop**
 Learning Technologies

Requirements:

The original disk(s)
 A blank disk for each title
 COPYA from your DOS 3.3 system master
 A sector editor

The softkeys in COMPUTIST #56 worked for these titles but I decided to copy the originals another way instead of bit copying them as the article says to do. I also added a sector edit to track \$11 that will let you catalog the disk.

1. Boot your DOS 3.3 system master and at the Applesoft prompt enter:
 POKE 47426,24
 RUN COPYA

2. Copy your original to your blank disk
 3. Make the following sector edits for the Shutterbug titles.

Trk	Sct	Byte	From	To
\$0D	\$0E	\$8A-8B	D0 D8	60 EA
\$11	\$00	\$01	11	03

3a. Make the following sector edits for the Lion's Work Shop

Trk	Sct	Byte	From	To
\$05	\$02	\$8B-8C	D0 D8	60 EA
\$11	\$00	\$01	11	03

4. Write each sector back to the disk before going to the next sector.

Softkey for...

**Milliken Mathfun Frenzy
 Flip Flop**
 Milliken Software

To deprotect this title we will use the RWTS of the protected disk, with Demuffin Plus to copy the files from the original disk then write them back to your blank disk.

Requirements:

The original disk
 A blank disk
 Demuffin Plus
 DOS 3.3 system master
 A way to reset into the monitor

1. INITIALize blank disk BOOT and delete BOOT.
 2. Boot your original disk and reset into the monitor after the first 3 tracks are read.

3. Move the RWTS to a safe place, so it won't be destroyed when you boot your slave disk, by entering:
 6800<B800.BFFF

4. Boot your slave disk
 C600G

5. Put in your Demuffin Plus disk and enter
 CALL-151 (gets you into the monitor)
 BLOAD DEMUFFIN PLUS,A\$803
 B800<6800.6FFF (moves the protected RWTS back to its original location)

A851G (reconnects DOS)
 803G (starts Demuffin Plus)

5. Put your original disk in and copy all of the files to your blank initialized disk. When asked to put in a file name enter = and when asked if you want prompting answer "N".

Softkey for...

Lucky's Magic Hat
 Advanced Ideas

Requirements:

The original disk
 A blank disk
 COPYA from your DOS 3.3 system master
 A sector editor

1. Boot your DOS 3.3 system master and at the Applesoft prompt enter:

POKE 47426,24
 RUN COPYA

2. Copy your original to your blank disk

3. Make the following sector edits to track \$00, sector \$01, starting at byte \$2E of your copy.

Trk	Sct	Byte	From	To
\$00	\$01	\$2E	5C 20 37	5F D0 5D

4. Write the sector back to the disk.

Softkey for...

Dinosaurs
 Advanced Ideas

Requirements:

The original disk
 A blank disk
 COPYA from your DOS 3.3 system master
 A sector editor

1. Boot your DOS 3.3 system master and at the Applesoft prompt enter:

POKE 47426,24
 RUN COPYA

2. Copy your original to your blank disk

3. Make the following sector edits to track \$00, sector \$0F, starting at byte \$0D of your copy.

Trk	Sct	Byte	From	To
\$00	\$0F	\$0D	A9 AE 85 48 A9	A9 D8 8D 42 B7
			8B 85 49 A9 80	A9 BF 8D 43 B7
			85 2B C6	4C 41 B7

4. Write the sector back to the disk.

Softkey for...

Success with Typing
 Scholastic

Requirements:

The original disks
 4 blank disk sides
 Any fast copy program
 A sector editor

1. Fast copy all 4 sides of your original to your blank disks.

2. Make the following sector edit to side 1 of your copy.

Trk	Sct	Byte	From	To
\$00	\$0F	\$60	C6	B7

Rather than take up room in my letter to explain the last 3 softkeys I think that Mr. Edward Teach should explain them to

you since he is capable of making it easy to understand for the beginner. Mr. Teach, if you please???

Just a thought or two. I was wondering what the readers would think of putting a "Volunteers Help Column" in COMPUTIST where, if you wanted to, you could list your name and phone number so that if anyone needed help, rather than write and wait perhaps months to get an answer, they could call one of the volunteers to get help right away. In the column it could list the name, phone number, best time to call, and possibly a particular area of expertise for that person. If such a column does come about I think a few rules should be set up, such as:

1. Call only during the time shown.
2. No collect calls

Perhaps the volunteers could be given a list of the names of subscribers to COMPUTIST and offer this service only to subscribers.

Persons interested in having their name listed as a volunteer should contact the RDEX editor. RDEXed

In the nearly 2 years that I have been subscribing to COMPUTIST I have met a number of people from the magazine. In speaking to them I have found most of them to be friendly and helpful. I know that without the help that they have given me I would not be as far along as I am in learning about my Apple. So to Don McClelland, Edward Teach, Jim Hart, Darryl Higa, Stephen Lau, Brian Troha, Jim Bancroft, Bill Jetzer, Roger Williams, Mike Ferreira, Edy Kusyano and last but not least Karen I want to say thank you. All of you have shown me what the spirit of COMPUTIST is all about, friends helping other friends. If I have left anyone out please forgive me but I have to leave enough room so that Ed Teach has room in this issue for his softkeys.

It has come to my attention that IBM really stands for:

- I've Been Misled
- I Believe in Miracles
- Itty Bitty Machine
- I Bought a MacIntosh
- Intermittent Bowel Movements
- I Believe in Money
- It's Better Manually
- I Buried Mine

Bill Jetzer

Softkey for...

VCR Companion *Broderbund*

Requirements:

- A blank disk
- Any whole disk copier
- A ProDOS disk

VCR Companion uses the Prolok protection scheme. The whole routine resides in the file VCRC.SYSTEM. To deprotect the disk, follow these steps.

1. Copy the disk using any standard copy program.
2. Boot a ProDOS disk and get into BASIC.

3. Insert the copy and load the file into memory:

BLOAD VCRC.SYSTEM,A\$2000,TSYS

4. Make changes so that it will skip over the protection check:

CALL-151

252A:18 60

(was A2 F0)

5. Save the file:

BSAVE VCRC.SYSTEM,A\$2000,TSYS

NOTES: This program actually took me over a week to deprotect. What I did was get into BASIC, load the file, make changes, and then attempt to start it with 2000G. Every time I did this, however, I got a "BAD VCR COMPANION DISK" error. I searched through the entire file for a checksum routine and found none. What I discovered is that it makes MLI calls that attempt to read data into pages of memory normally reserved by BASIC.SYSTEM. This causes MLI errors, and thus the "BAD VCR COMPANION DISK" message. All in all it was a pretty dirty trick.

One of the more annoying features about this program is that you have to reboot when you're done using it. Originally, I wanted to get it to quit to ProDOS, but found that it's not possible. The ProDOS quit code is normally stored in bank 2 of the language card. VCR Companion uses this space for storing its own data, and overwrites the quit code in the process.

Edward Teach

Nibble Counts/Checks Revisited

Thanks Jack for that warm introduction (geez.. you kept that short). What Jack just did was to write around several nibble checks. Since he did not go into detail, I will. All of the checks

should be easy to spot. After a C08C a non-standard byte is checked (\$E7 or \$FF). The theory of the check is like walking down a long hallway. There are many rooms (subroutines). One of the rooms is marked "nibble checks". When the program goes into that room it checks the disk and comes out, however not always by the same door. After the program exits the room it can be checked to see if it is holding any special items - Was the carry set or clear, was a certain value stored in a memory location when the program exited? If all is the way it is suppose to be then the program goes on its merry way.

The Success with Typing went in the front door of the nibble room and if it came out the same door it rebooted. Jack made it go out the \$B700 door so it would continue running. This is also the story with Lucky's Magic Hat. The program went in the front door and out the side door. The Dinosaur program was just a little different. In that room the program needed to place a few values in certain locations to exit the room. (A \$D8 at \$B742 and a \$BF at \$B743). When it exited out the side door again (we seldom leave by the front door), the program said "all the values correct?" and went into the next room to continue running. To defeat these checks all you have to do is read what the program expects to find and where it expects to go after leaving the room. I really hope that I have made this clear for the beginners.

Softkey for...

Typhoon of Steel

SSI

Requirements:

- Two blank disks
- A whole disk copier
- A sector editor

I bought this disk since I had heard about SSI's RDOS but had never actually seen it. Thank goodness it was cheap, unless you are into war simulations this disk is a bust. Anyway, I pulled out Computist #52 and read the excellent article by M.M.McFadden. Not only is RDOS explained but there is a convert program to ProDOS for RDOS. The disk fast copied. No errors no problems (what good is trying to deprotect a COPYA disk!). To see RDOS in action boot the disk and when the first menu pops up press reset. Now the RDOS is in memory and usable. Type & C AT (funny spacing,eh?). The files scroll past and look normal. Funny I thought that there was going to be more to this disk. Looking in the manual there is a paragraph called "copy protection". There it says "There is no physical copy protection", but you will need a commercial bit copy program since this disk uses its own DOS. Excuse me SSI... you got it wrong. This disk copies with any program. The only protection is the old look it up in the manual and enter it in the program. To fix

this change:

Trk	Scr	Byte	From	To
\$22	\$00	\$77-78	C9 A2	4C D8

This change is made to the Pacific, Asia, and Europe disks. It is in the file B.BRAIN and the bytes to search are 20 5D 45 CD A2 47. Now when you save the game it asks the question.. says correct and continues on.

Enjoy!

Biff The Bard

Attn: Mr. Tirad. This letter is in response to the many questions you had regarding Bard's Tale II and III.

The only way I know of to prevent the loop you mentioned from occurring is to have one of your spellcasters cast one of the many spells available on the monster before it destroys your party. Using your example of the dragon that went insane; you could have cast the fourth level Flesh Restore or the seventh level Flesh Anew conjurer spells, the seventh level magician Restoration spell, the level five wizard Baylor's Spell Bind, or the level three Camaraderie and level five Heal All ArchMage Spells. If the monster kills off your spellcasters before you do this then the loop will occur!

In regards to your question about the NightSpear in Arboria, I am going to assume you are stuck on level three of The Tower in front of the stone disc. Before you can proceed any further you must get an acorn from the oak tree in the wilderness and get the Water of Life from the Crystal Palace under the pool behind the fisherman's hut. The fisherman will tell you his story and offer to teach the GILL spell to one of your spellcasters for a price. After you have acquired both of these go back to the stone disc and put the acorn in the small hole then use the Water of Life on the acorn. On level four go 1S,1E,1N,1E,2S,4W,3N,1E,1N,2E from the stairs and you'll have the NightSpear.

In answer to your questions about items in Bard's Tale II:

Fins Flute- Enhances the affect of your Bard's tunes.

Powerstaff- Drains 90-156 damage points, with a range of 10'.

Ring of Power- Drains up to 120 damage points, range unknown.

Hawkblade- Magic Sword of some worth. Increases total number of attacks a Warrior gets in proportion to his level of

experience.

Soul Mace- In the hands of a hunter will increase his chances to critically hit.

Conjurstaff- Boosts spellcasters AC by 2 and halves the amount of spell points it takes to cast a spell.

The only way to prevent energy in Bard's Tale II is to avoid anti-magic zones if possible. In Bard's Tale III the Geomancer has a spell called Roscoe's Alert(ROAL) that will reveal all anti-magic zones on the dungeon level you are on when it is cast.

Happy Adventuring

Paul A. Johnson

Another Duodisk Modification (Reversible)

Requirements:

- Computist #64
- 2 - SPDT Center Off Switches
- 6-stranded ribbon cable
- Project Box
- Screwdriver, Soldering Gun, Drill, and electrical tape
- Male & Female 9-pos. D Subminiature Connectors (optional)
- 9-pos. hood for connector above (optional)

Optional:

- Computist #33
- 4 or 10 stranded ribbon cable
- Audio Jack (1/8" closed)
- 1000 ohm potentiometer and 10 ohm resistor
- Male & Female 9 or 15 pos. D Sub. Connectors
- Hood for connector above

The reason why I came up with this method of modifying my computer is the standard warning that comes before any of the articles in COMPUTIST that require modifications to hardware:

"Warning: The procedure described below requires the modification of your computer and may void any warranty, COMPUTIST will not be held responsible for any damages incurred while following this procedure."

I didn't like the sound of that warning. I also would like to be able to remove any changes that I have made, just in case I have to take my computer in for service. Enough of the introduction, let's get to work.

Get out your copy of COMPUTIST #64 and follow Zorro's directions on getting to the circuit board inside the Duodisk. Now, instead of removing all of the connectors he says to remove, only remove DI#1 and DI#2. Looking carefully at one of these connectors, you will see that they have a side marked "A" and a side marked "B". On side "A", there should be a purple wire at position A6 and an orange wire at position A5. After grounding yourself, carefully put a small screwdriver into the hole at A5 and depress the tab holding the orange wire in the connector. Pull this wire out of the connector carefully. Next, separate the ribbon cable at one end so the individual wires are about 5 inches long. Strip the ends of three of the wires (preferably three next to each other) and insert one of them into the orange wire that you removed from the connector. Insert another wire into the slot where the orange wire used to be in the connector (position A5). The third wire goes into the connector at position A6 with the purple wire. I found that if I bent the wires over double, they would fit tighter. Repeat the above steps for the other connector, using the other three strands of the ribbon cable. Reconnect the connectors into their proper jacks, and tape the exposed section of the orange wires. Now it might be a good idea to jot down on a piece of paper where each wire of the ribbon cable is connected. Also, take a marker and color one wire at the other end of the cable for reference in case it gets twisted.

Put the free end of the ribbon cable through the opening to the right of the interface plug and put the drive cover back on. Then put the cable through one of the air vents in the back of the Duodisk cover and note on the cable the approximate location where it will go through the cover. Fold the cable over a couple of times and tape it together. This will give a kind of strain relief so the wires won't get pulled out. Put the cover back on the Duodisk.

Now we move to the other end of the cable. First, mount the two switches on the project box. Put the wire from position A5 on the connector on the middle of the switch (OFF position), and the other two wires onto the two ON positions. Do the same with the other three wires and the other switch. Test out which way which way enables writing all the time and which way checks the disk for a write protect tab. Mark these on your box, and you're finished. If you want to be able to remove the box from the Duodisk, (and if you are going to do the optional modification below), then mount one of the 9-position D Subminiature connectors on the side of the box and the other onto the cable. This will allow the box to be removed from the disk drive.

The other stuff in the "Optional" list at the beginning is for putting a volume control and earphone jack on the box. Follow the directions in the article in COMPUTIST #33 by William Wingfield, Jr., titled, "How to be the Sound Master." The only difference is that the jack and potentiometer will be in the project box. Two wires will come from the speaker jack on the mother board and two wires will return to the speaker. Use the connectors in the

list to separate the box from your computer in the same manner as above, or you can attach the connector to the back of the computer and have the wires coming out of the project box. This second way helps to tell which set of wires goes to the disk and which goes to the computer.

For those of you with a Senior Prom, you can cut the wires to the switches and mount the switches on the project box, in which case you will need a set of 15-position D Subminiature connectors between the box and the computer instead of a 9-position set. I did this because I like to have all of the switches in one place and I could never get the switches to stay stuck to the side on my computer with that foam tape.

I hope that this letter is some use to you. I have not explained everything in great detail, mostly because the other issues of COMPUTIST mentioned already have good instructions. Another copy of COMPUTIST that would be helpful to read is COMPUTIST #23, the article titled "How to be the Writemaster", by William Wingfield, Jr. If you have any questions, please write to me through the RDEX. Thank You.

Softkey for...

Impossible Mission II

Epyx

I saw that this program was on the most wanted list, so I decided to give it a try. It turns out that it has the same protection as The Games - Summer Edition, only it is in a different location. Thanks to George Sabeh for the information given in COMPUTIST #64.

1. Tell DOS to ignore errors and use COPYA to copy the disk.
POKE 47426,24
RUN COPYA

3. Make the following sector edits on Track \$00, Sector \$05:

Trk	Sct	Byte	From	To
\$00	\$05	43	D0 F4	EA EA
		4C	D0 4A	EA EA
		55	D0 41	EA EA
		68	D0 F4	EA EA
		6C	A0 07 BD 8C	EA EA A9 FC
			C0 10 FB 99	85 F0 85 F3
			F0 00 EA 88	A9 EE 85 F1
			10 F4	85 F2

4. If the data locations aren't the same for your version, then search for A0 07 BD 8C C0, then count back the correct number of bytes for the other locations.

5. Write back the changes to the disk.

6. Copy the second side using steps #1 and #2 above.

I would like to see Risk by Leisure Games on the Most Wanted List. It is distributed by Electronic Arts, and it can be copied with COPYA so that there is a catalog, but it is doing some sort of disk check that I can't find. It is a ProDOS disk. Thank You, and I hope that everybody (editors AND contributors) will keep up the good work.

Dr. Lester S. Cohen

Using Print Shop graphics with Beagle Screens

I own both Printshop and Beagle.Screens and Beagle Triple.Dump. The Printshop Graphics disk on its back side contains a screen called Certificate. I wanted to use it but found that the font option could not be fitted to write on the open area. Here is how I merged the two systems that permitted me to write on the Certificate with Beagle.

Use Copy II+ and copy the file called Certificate to your Beagle.Screens disk. Next, again using Copy II+, unlock the Certificate file on your Beagle.Screens disk.

Now use Beagle.Screens in it's normal manner, and you will find that Certificate is available. Load an appropriate font and, since Beagle.Screens lets you move the cursor anywhere you wish, you can fill in the Certificate as you wish.

I have not tried it, but I assume that the other Magic Screens from Printshop will also work the same way. I also suspect that any of the Printshop graphics could be transferred for use with Beagle.Screens in the same manner, permitting the use of the Beagle.Screens fonts anywhere you want them on Printshop graphics.

Zorro

Softkey for...

Ultima V

Origin Systems Inc.

Requirements:

Ultima V Softkey by Captain Dan (COMPUTIST #61)

Super IOB v1.5
8 blank disk sides

None of the softkeys in the past few issues has worked for me except for the one by Captain Dan in COMPUTIST #61 (Nice softkey, Captain). Instead of wasting the time to BLOAD a file, however, why not just POKE the needed values into memory? After some rearranging of code I came up with several modifications to the controller, which is listed below in its entirety. To examine the functions of the mods, just compare this listing with the one in COMPUTIST #61. Note: only the lines after 10010 are changed.

1. Clear memory and boot the disk you wish to save the controller on.
NEW (or FP)
PR#6
2. Type in the controller at the end of this section.
3. Execute Capture (from the COMPUTIST Starter Kit), and when prompted enter the controller name and press RETURN.
EXEC CAPTURE
RUN

Controller

```
1000 REM ULTIMA V CONTROLLER
1010 TK = 0:ST = 0:LT = 35:CD = WR
1020 POKE 47507,0: POKE 47517,0
1030 UB = 0:T1 = TK:GOSUB 490
1040 IF UB = 1 THEN 1060
1050 IF TK = > 3 THEN CALL 6400:UB = 1
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 1040
1090 UB = 0:GOSUB 490:TK = T1:ST = 0
1100 CALL 6417:UB = 1
1120 GOSUB 430:GOSUB 100:ST = ST + 1: IF ST
< DOS THEN 1120
1130 ST = 0:TK = TK + 1: IF BF = 0 AND TK <
LT THEN 1100
1140 IF TK < LT THEN 1030
1150 POKE 47507,174: POKE 47517,164: HOME :
PRINT "COPYDONE": END
10010 GOSUB 10055
10050 PRINT : PRINT CHR$(4) "BLOADIOB.OBJ0,
A$300": GOTO 10060
10055 FOR Z = 6400 TO 6433: READ I: POKE Z,I:
NEXT Z: DATA 162,0,189,184,191,24,105,17,
157,184,191,232,224,16,208,242,96,162,0,
189,184,191,56,233,17,157,184,191,232,224,
16,208,242,96: RETURN
```

Checksums

1000-\$356B	1060-\$D138	1130-\$8F8F
1010-\$3266	1070-\$0586	1140-\$F6BB
1020-\$5917	1080-\$752E	1150-\$861C
1030-\$51D2	1090-\$D00D	10010-\$AA4A
1040-\$8CFB	1100-\$DD2C	10050-\$A2CC
1050-\$DE3C	1120-\$FF2E	10055-\$1B2E

Keep in mind the fact that this controller is meant for the PROGRAM disk only - the others may be copied with COPYA.

Playing Tip for...

Ultima V

Origin Systems Inc.

•The black badge is located at a keep called WINDEMERE, SE of the Isle of the Avatar. Ask the wizard for it, and use the password for the Oppression, IMPERA.

•The Sword of Chaos is located in a storeroom in Blackthorn's Palace, NW section of the 1st level. WARNING: Whoever you equip with this item will become possessed and attack your party.

•There is no way to avoid the gargoyles when searching for the crown, UNLESS you have some RT (negate time) scrolls handy.

•The items of Lord British each have special properties. The crown, when worn, absorbs all forms of magic attack, including magical possession. The scepter can dispel fields (fire, poison, sleep, protection). The amulet is used within the 'ethereal plane,' and you must get there somehow in the Underworld near the entrance to the dungeon Shame. The box doesn't seem to do anything so far.

•Doc Devious asked about the Ankh (COMPUTIST #64). As it is read in the Book of Lore, the Ankh is supposed to "ward off harm for knights striving to achieve the eight virtues." It seems to do this quite well, because after unequipping my Avatar of his Ankh, a greater frequency of attacks was evident.

•If your characters are less than level 8, always carry a moonstone or two - when (U)sed in a grassy area in the Underworld, stones can transport you immediately to Britannia, as well as make a

gateway between the two areas.

To John J. Willems: I have Disk Muncher 8.0, send your letter to me c/o COMPUTIST. Just put my name on a stamped envelope and place it in one addressed to the Apple RDEXed. The editor can then relay it to me.

If anyone had trouble with my modification in COMPUTIST #61, be sure to drop a line in the RDEX.

Jeffrey K. Wagner

Softkey for...

The Astronomy Disk

Prentice-Hall

Requirements:

Blank disk (5.25")

Super IOB v1.5 with Swap Controller

A way to get into the Monitor

Since I am both a teacher of astronomy and an avid amateur astronomer, one of the first programs I purchased after buying my Apple IIc was "The Astronomy Disk." This software package contains some excellent simulations and demonstrations, but is copy-protected and doesn't even come with a backup. While a friend of mine was able to copy the disk with Locksmith, I was interested in seeing the programs on the disk (they are all Applesoft) and the protection was quite frustrating. Cracking this disk became my goal and was the main reason I started subscribing to COMPUTIST just over a year ago.

Although I'm certainly no expert, COMPUTIST has helped me very much, and "The Astronomy Disk" was the first disk I was able to de-protect. It turns out to have a modified RWTS and copies easily with the standard swap controller. However, the problem for me was capturing the disk's RWTS. With my Apple IIc, there is no way to break into the program without installing some sort of EPROM with an "absolute reset." Fortunately the problem was solved when we got a few Apple IIgs's at the school where I teach. The "Visit Monitor" function allowed me to capture the DOS, and the rest was easy. Adding a fast DOS to the disk speeds things up considerably, and I also converted the disk to ProDOS, compiled everything with the Beagle Compiler, and got even faster results.

1. Initialize a disk with either DOS 3.3 or a fast DOS like Pronto-DOS and delete the HELLO program.

2. Boot "The Astronomy Disk" and wait until the menu appears. Then get into the Monitor, either with "Visit Monitor" using a IIgs or an absolute reset using an Apple IIe, IIc, etc.

3. Move the RWTS down in memory.

1900-B800.BFFFM

4. Boot a DOS 3.3 disk with no hello program.

C600G

5. Save the RWTS.

BSAVE RWTS.XXX, A\$1900, L\$800

6. Install the standard swap controller (SWAP.CON) into Super IOB, then run Super IOB. Be sure to answer NO when asked if you want to initialize a blank disk, since your own DOS is already on it.

Enjoy the convenience of an unprotected disk!

{?} I use Bank Street Writer Plus by Broderbund for almost all of my word processing work. Unfortunately, I haven't been able to copy this program, let alone de-protect it. I've tried all sorts of copy parameters with Copy II Plus, and even written to Central Point, but nothing has worked. If anyone can give me any help on this one, please write to me

Jeffrey K. Wagner
Firelands College
901 Rye Beach Rd.
Huron, OH 44839

{?} This question may be out of place in a de-protection magazine, but if anybody can answer it, I'm betting COMPUTIST readers can. I bought an Epson LQ-850 letter-quality printer for word processing and its text output is fantastic. However, I've had no luck in printing graphics with it. I'd be interested in hearing from any Epson LQ-series owner who can tell me how to print Apple graphics. (See address above.)

I would be interested in the answer to this question too. I've had several readers call and ask about the same thing. RDEXed

Chris Moffitt

Softkey for...

Technocop

Epyx/U.S. Gold

I bought this game and figured that I could copy it using the softkey in COMPUTIST #64 for Dive Bomber. I got home and

copied the game with no problem using a modified COPYA. When I went in with a sector editor (Copy II+) there was nothing resembling the protection used in Dive Bomber! I almost gave up, but I decided to try George Sabeh's softkey for The Games-Summer Edition in COMPUTIST #64. I lucked out and was able to use the same basic sector edits with a few changes. Here's how I made a deprotected backup.

1. Boot your DOS 3.3 system disk.
2. Tell DOS to ignore checksum and epilog errors. Use this to copy the front side, the back is not protected.

POKE 47426,24
RUN COPYA

3. Get out your sector editor and make the following edits.

Trk	Sct	Byte	From	To
\$00	\$0C	\$35-36	D0 F4	EA EA
		\$43-44	D0 F4	EA EA
		\$4C-4D	D0 4A	EA EA
		\$55-56	D0 41	EA EA
		\$69-6A	D0 F4	EA EA
		\$6D-7A	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

Softkey for...

Marble Madness

Electronic Arts

I used William Moolenaar's softkey for Earth Orbit Stations (COMPUTIST #53, pg 12) to deprotect my copy.

{?} Can anyone recommend a good book on assembly language programming for a beginner. I've looked everywhere but can't find one.

{?} Does anyone out there know how to make a standard hires picture into a single BRUNable file? Or have a program that will do it and install it to boot up on a disk? You could send it to: Chris Moffitt, 8235 Ole Pike Cove, Germantown, TN. 38138.

Marc Batchelor

Softkey for...

Video Title Shop

DataSoft

Requirements:
Whole Disk Copier
Sector Editor
Disk searcher

When I was first asked to crack this program by a friend, I said to myself, "Self, this can't be too hard. The program verification routine is performed in the first few seconds of the boot." Well, looks can be deceiving! I started by booting the disk (of course). In about 2.5 seconds, the drive shut off and a message came across the screen that said "PLEASE USE ORIGINAL DISK". Then the system hung. So, I pressed the NMI button on my Senior Prom (Cutting Edge Enterprises) and listed the contents of the stack. It was still executing at \$452D. So, I dropped into the monitor by pressing the delete key and listed that range of memory. WOW!!! Major disk verification. It is a shame that I can't figure out the weird stuff that was happening. However, at \$452D was a JMP to \$452D. An obvious infinite loop. Just the same as 10 GOTO 10 in BASIC. So I said to myself "Self, just search the disk for this routine and you are home free." Unfortunately, I answered back after searching the disk a few times and said "Nope, not that easy." I decided that boot code tracing was the only way to catch the routine in the act of the crime. So, after much time and many printouts, here is what I found. The decryption revolves around one slick routine.

0861	A9 40	LDA	#\$40	
0863	85 03	STA	\$03	
0865	A0 00	LDY	#\$00	
0867	A4 02	STY	\$02	
0869	A2 06	LDX	#\$06	
086B	B1 02	LDA	(\$02),Y	Begin at \$4000 (\$02),00
086D	48	PHA		Push
086E	4A	LSR		Logical Shift Right
086F	68	PLA		Pull
0870	6A	ROR		Rotate right
0871	91 02	STA	(\$02),Y	Store at \$4000 (\$02),00
0873	C8	INY		Y=Y+1
0874	D0 F5	BNE	\$086B	Decrypt \$4000-40FF

There are several of the same routines lying around to decrypt \$4000 - \$5000. The code that we're interested looks like this:

43E1	20 E7 44	JSR	\$44E7	
43E4	78	SEI		
43E5	20 2F 44	JSR	\$442F	;Disk check routine
43E8	A2 01	LDX	#\$01	
43EA	20 E7 44	JSR	\$44E7	

43ED	20 2F 44	JSR	\$442F	;Do it again
43F0	58	CLI		

442F	AE 6A 40	LDX	\$406A	
------	----------	-----	--------	--

— Misc Code —

443C	BD 89 C0	LDA	\$C089,X	;Turn on disk drive
------	----------	-----	----------	---------------------

443F	BD 8C C0	LDA	\$C08C,X	
------	----------	-----	----------	--

4442	DD 8C C0	CMP	\$C08C,X	
------	----------	-----	----------	--

— Misc Code —

44A1	60	RTS		
------	----	-----	--	--

44A2	4C 1F 45	JMP	\$451F	;Don't like what you see
------	----------	-----	--------	--------------------------

451F	BD 88 C0	LDA	\$C088,X	;Turn off disk drive
------	----------	-----	----------	----------------------

4522	A0 17	LDY	#\$17	
------	-------	-----	-------	--

4524	B9 30 45	LDA	\$4530,Y	;Pointer to text
------	----------	-----	----------	------------------

4527	99 B0 05	STA	\$05B0,Y	;Store text to screen
------	----------	-----	----------	-----------------------

452A	88	DEY		
------	----	-----	--	--

452B	10 F7	BPL	\$4524	
------	-------	-----	--------	--

452D	4C 2D 45	JMP	\$452D	;Infinite loop!
------	----------	-----	--------	-----------------

4530				PLEASE INSERT ORIGINAL DISK
------	--	--	--	-----------------------------

As you can see, we need to locate the JMP's to the protection, and remove them. The encrypted bytes can be found through the boot code trace. For the sake of completeness, here is the routine I used to get the encrypted values.

1. Move \$C600 to \$9600 for editing.

2. Patch the code at \$96F8.

96F8:A9 00 8D 8E 08 A9 98 8D 08 8F 4C 14 08

96F8	A9 00	LDA	#\$00	
------	-------	-----	-------	--

96FA	8D 8E 08	STA	\$088E	
------	----------	-----	--------	--

96FD	A9 98	LDA	#\$98	
------	-------	-----	-------	--

96FF	8D 14 08	STA	\$088F	
------	----------	-----	--------	--

96FF	4C 01 08	JMP	\$0801	
------	----------	-----	--------	--

3. And at \$9800.

9800:A9 00 8D 7B 08 4C 14 08

9800	A9 00	LDA	#\$00	
------	-------	-----	-------	--

9802	8D 7B 08	STA	\$087B	
------	----------	-----	--------	--

9805	4C 14 08	JMP	\$0814	
------	----------	-----	--------	--

4. Execute the boot

9600G

When the boot finishes (a record 1.25 seconds), the code you want to examine starts at \$43CB and looks like good code. We are interested in \$43E5 and \$43ED since they call \$442F (the beginning of the protection). Now, change the code you entered before and boot again.

9802:8D 61 08

9600G

9802	8D 61 08	STA	\$0861	
------	----------	-----	--------	--

This time, the boot finishes even faster (about 1 second). The code at \$43CB is garbage. Look at \$43E5 and \$43ED. You should now see 40 5E 88 in both places. We now need to search the disk for 40 5E 88 and change it to D5 D5 D5 (will be EA EA EA when decrypted). Remember to change in both places.

1. Use COPYA to copy the disk

2. Boot your favorite disk searcher/sector editor and search for 40 5E 88. I found them on track \$00, sector \$04, starting at bytes \$E5 and \$ED.

3. Change the bytes to D5 D5 D5.

4. Write the changes back to the disk.

In closing, remember that what looks like an easy crack, usually isn't!

Bud Myers

A couple of quick notes regarding the article "Change Appleworks Cursor" in Issue #60:

As published, the patch does not produce a closed-apple cursor. BASIC's POKE command uses decimal, not hex values. POKE 11681,64 to get the closed-apple cursor, but ONLY if you are using Version 2.0 or above of Appleworks. I suspect there are quite a few users, like me, who see no reason to invest an additional \$200 when Version 1.3 (with Macroworks and the AE Ramworks expansion software) does such an excellent job.

{?} How about another patch to make the overwrite cursor an open-apple?

Brian Sparks

A.P.T. for...

Wizardry IV

SirTech

Here are a few helpful locations to remember while playing Wizardry IV by Sir-Tech. All saved games are stored on side A at the following locations:

Game 1 - track \$05, sector \$07

Game 2 - track \$05, sector \$05

Game 3 - track \$05, sector \$03

Game 4 - track \$05, sector \$01

Game 5 - track \$06, sector \$00

Game 6 - track \$06, sector \$0D

Game 7 - track \$06, sector \$0B

Game 8 - track \$06, sector \$09

All games are saved in the same format with these values at the same location each time:

\$86 — current hit points

\$88 — hit point max

\$82 — current mage level

\$85 — normal mage level

\$92-9E — (every other byte) mage spells remaining

\$A0-AC — (every other byte) priest spells remaining

\$4A,\$52,\$5A,\$62,\$6A,\$72,\$7A — items that are carried (a 01 two bytes after the item means it is equipped)

\$7C, \$7E — keys remaining (see table two)

\$34,\$35 — gold remaining (see table three)

Remember that all values are entered in hex!

Location and level are on the sector before at the following bytes:

\$0E - East, West location of Werdna

\$10 - North, South location of Werdna

\$12 - Level +1 that Werdna is occupying (in hex)

Maps are based on a 20 by 20 grid system.

Also if you own a black box, received by killing the assassin on the 8th floor, the locations of the items placed inside are on the same sector as the level and location at bytes \$4A thru \$6E (every other byte). Using and equipping this box will keep your possessions from being stolen.

The number of monsters travelling with you are at the following locations of the initial sector.

\$D0 - number in group one

\$D2 - number in group two

\$D4 - number in group three

Table 1

00 - nothing	01 - bloodstone
02 - lander's turq.	03 - amber dragon
04 - hhg of aunty ock	05 - winged boots
06 - dreampainter ka	07 - east wind sword
08 - west wind sword	09 - dragon's claw
0A - hopalong carrot	0B - cleansing oil
0C - witching rod	0D - aromatic ball
0E - void transducer	0F - kris of truth
10 - inn key	11 - crystal rose
12 - dab of puce	13 - pennonceaux
14 - maintenance cap	15 - long sword
16 - short sword	17 - anointed mace
18 - anointed flail	19 - staff
1A - dagger	1B - small shield
1C - large shield	1D - robes
1E - leather armor	1F - chain mail
20 - breast plate	21 - plate mail
22 - helm	23 - potion of dios
24 - potion of porfic	25 - long sword +1
26 - short sword +1	27 - mace +1
28 - staff of mogref	29 - scroll of katino
2A - leather +1	2B - chain mail +1
2C - plate mail +1	2D - shield +1
2E - st. ka's foot	2F - scroll of badios
30 - scroll of halito	31 - staff +2
32 - dragon slayer	33 - helm +1
34 - jeweled amulet	35 - scroll of badial
36 - potion of sopic	37 - long sword +2
38 - good hope cape,	39 - magician's hat
3A - novice cap	3B - scroll of dilto
3C - copper gloves	3D - initiate turban
3E - wizard skullcap	3F - plate mail +2
40 - shield +2	41 - mordorcharge card
42 - potion of dial	43 - ring of porfic
44 - were slayer	45 - mage masher
46 - mace of curing	47 - staff of montino
48 - blade of cusinart	49 - amulet of manifo
4A - rod of flame	4B - cape of hiding
4C - cape of jackal	4D - cape of hiding
4E - amulet of makanito	4F - diadem of malor
50 - scroll of badial	51 - dagger +2
52 - dagger of speed	53 - lich's robes
54 - skull cap	55 - potion of masopic
56 - silver gloves	57 - get out of jail free
58 - golden pyrite	59 - oxygen mask
5A - chronicles of H	5B - lord's garb
5C - muramasa blade	5D - shuriken
5E - chain of ice	5F - nothing
60 - nothing	61 - ring of healing

- 62 - ring of dispelling
- 64 - adept baldness
- 66 - demonic chimes
- 68 - black box
- 6A - bishop's tongue
- 6C - arrow of truth
- 6E - rallying horn
- 70 - myhril glove
- 72 - twilight cloak
- 74 - cone of silence
- 76 - night cloak

- 63 - ring of death
- 65 - arabic diary
- 67 - black candle
- 69 - st. trebor's rump
- 6B - st. rimbo's digit
- 6D - orb of dreams
- 6F - signet ring
- 71 - holy limpwrst
- 73 - shadow cloak
- 75 - darkness cloak
- 77 - entropy cloak

I realize that there are some repeats, but I don't know why. Also keep in mind that some of these items are cursed and can only be dropped with the use of cleansing oil. Some of these items are the only methods I know of casting priest spells!

Table 2

The keys value is encoded like this:

- byte \$7C - each number here is taken at face value ie 01 = 01, 02 = 02...etc.
- byte \$7D - each number here equals 256, for example, 01 = 256, 02 = 512...etc.
- byte \$7E - each number here equals a different value, but it is traceable. 01 = 9999, 02 = 19999, 03 = 29999...etc.

The total number of keys equals byte \$7C + \$7D + \$7E. If you don't like math, then just enter FF's in these three bytes.

Table 3

The gold is encoded in much the same fashion as the keys.

- byte \$34 - each value is absolute...01 = 01, 02 = 02...etc.
- byte \$35 - each number here equals 256, ie 01 = 256, 02 = 512 and so on. Total gold equals \$34 + \$35.

Table 4

Byte \$22 changes Werdna's race.
01 = human, 02 = elf, 03 = dwarf, 04 = gnome, 05 = hobbit

Table 5

Byte \$24 changes Werdna's class and enables him to use the appropriate weapons and armor for the class. Even though I change the class, he still won't cast priest spells.
00 = fighter, 01 = mage, 02 = priest, 03 = thief, 04 = bishop, 05 = samurai, 06 = lord, 07 = ninja

Table 6

Byte \$2A will change Werdna's alignment. (01 = good, 02 = neutral, 03 = evil)
Beware this changes the way Werdna's buddies feel about hanging around him, and should only be used at the right time. (the closer to the end the better!)
There might be some mistakes or loopholes but almost everything here works as far as I know, and I have completed the game.

Playing Tip for...

Wizardry IV SirTech

- Winged boots will keep you out of trouble on the 8th level
- Use St. Trebor's rump to get him off your back
- You can't use the MALOR spell until you open the EGRESS
- Use of the bloodstone, amber dragon, and lander's turquoise at the altar on the 7th level will give you the choice of three very good weapons
- What Trebor does is the password into the castle.

Above all, don't give up, this is one of the toughest games I have seen, but it still can be fun and very surprising. Good luck!

Dan Halfwit

Softkey for...

King of Chicago Mindcape (Cinemaware)

This game took months of thought to crack. None of the standard things to look for showed up. Nothing even close to resembling anything! However, one morning, I got the idea that either they had 2 different routine, one for each track, or they had a different way of telling it which track to look on. It was the latter. As opposed to having A2 20 (LDX #20 for track 20) it was A9 20 00. This value, representing the track, was stored at location \$01 9F72. The side was then stored at \$01 9F74 in the same manner. Thus made the search code A9 20 00 8D 72 9F A9 01 00 8D 74 9F. However, it is encrypted on the disk, so A9 20 00 had to suffice. (It was discovered that there were a LOT of A9 20 00's,

so I used A9 21 00.) We see:
01/AC34:

A9 20 00	LDA	#0020	Track 20
8D 72 9F	STA	9F72	Store it
A9 01 00	LDA	#0001	Side 1
8D 74 9F	STA	9F74	Store it
F4 02 00	PEA	0002	
F4 C2 63	PEA	63C2	
22 7C AC 01	JSL	01AC7C	Nibble Count
7A	PLY		
7A	PLY		
AD 76 9F	LDA	9F76	Load w/Nibble Count Result
AD 78 9F	STA	9F78	Store it to be checked

And it is the same for the next track with obvious minor changes. Matters are further complicated by the encrypted code. This is a pain to work around, but it isn't impossible. First, we change the LDA #0020 to the first pass value. This is 20A6 in 16-bit mode. We change the LDA #0001 to a STA to avoid another Accumulator load we don't want. We then store the value where we want, \$9F78. Same with the next part, only the pass code is 1E50 and stored at \$9F7A. And, we must can the nibble count so we don't read track 20A6! Here are the patches:

Blk	Byte(s)	From	To
\$573	\$129	A9 20 00	A9 A6 20
	\$12F	A9 01 00	8D 78 9F
	\$13B	22	AF
	\$147	A9 21 00	A9 50 1E
	\$14D	A9 01 00	8D 7A 9F
	\$159	22	AF

And that should be all. I don't like this trend of waiting to middle or even the end of a game before copy protection rears its ugly head. Copy protection, illegal as it is, is causing more problems than it should. In the end, the honest users always get it, along with everyone else.

Another comment. For Final Assault, I believe I have the method of cracking it, but now I need to implement it. The code is very tight, allowing little room to place the pass flags. The signature is 94 20 3E 1E that must be placed in bytes \$EC-\$EF in zero page, and a \$3E in \$01/49F1 and a \$94 in \$01/49F3. That should make all work well, but I can't tell for sure. By the way, look for A2 20 00 A0 01 00 (16-bit registers) to find the copy protection. I found it on blocks \$354-\$355. It modifies itself, so it is a pain. Have fun & hope that this might give some help.

[?] Anyone have any ideas on Dungeon Master? Perhaps by the time you read this, the article will be on it's way. By the way, to the reader in the February Computist, Dan Halfwit is my poison pen name.

Softkey for...

Serve & Volley

Accolade

Requirements:
Fast copy of Serve & Volley
Sector Editor (Copy II Plus)

This is a little strange. Instead of getting more complex, it looks like the people at Accolade are just giving up. On Block \$DD we see the following code:

DF:	E2 30	SEP	#30	8-Bit Registers
E1:	A2 20	LDX	#20	Track 20
E3:	A0 01	LDY	#01	Side 1
E5:	20 B4 00	JSR	00B4	Do Nibble Count
E8:	B0 0C	BCS	\$F6	Branch if Failed
EA:	A2 21	LDX	#21	Track 21
EC:	A0 01	LDY	#01	Side 1
EE:	20 B4 00	JSR	00B4	Do Nibble Count
F1:	B0 03	BCS	\$F6	Branch if Failed
F3:	A9 00	LDA	#00	Set flag for PASS
F5:	60	RTS		Return
F6:	A9 01	LDA	#01	Set flag for BOMB
F8:	60	RTS		Return

There are several solutions. First, we can change the LDA #01 to a LDA #00 and it will pass either way. We could place an RTS at the beginning of the routine. We could trace the code to it's source and can the JSR to the code altogether. Or, we could do what I did: Trash the branches. Make the following edits:

Blk	Byte(s)	From	To
\$DD	\$E9	0C	00
	\$F2	03	00

Write it back out. Have a blast. (I was in a hurry, so I didn't try this, but I decided to include it anyway. Make this edit to can the check entirely.)

Blk	Byte(s)	From	To
\$DD	\$DF	E2 30	EA 60

Softkey for...
Impossible Mission II

As of late, EPYX has been getting downright rude in its protection. With Final Assault, (I'm working on it...) your character dies a horrible death from nothing and then insults you. So far, I got rid of that and it works most of the time. Anyway, back to IM2. Like Epyx's older schemes, but it actually checks the results of the nibble count. No problem. We just take a look at what the original gives for passing codes and put them in. (Sorry for the missing pieces of code, but you can look at your copy to see what is there.) Going on, we see this code:

35:	8B	PHB	
	4B	PHK	
	AB	PLB	
	AF 98 59 00	LDA	005998 (ENCRYPTED)
	48	PHA	
	22 F5 69 00	JSL	0069F5 (ENCRYPTED) irst Check
	FA	PLX	
	B0 ??	BCS	DEATH Branch if Failed
	E2 30	SEP	#30 8-Bit Mode
	A2 20	LDX	#20 Track 20
	A0 01	LDY	#01 Side 1
	20 D7 69	JSR	69D7 Do Nibble Count
	B0 02	BCS	\$51 BOMB
	80 ??	BRA	AROUND BOMB
	A2 FF	LDX	#FF Definite Fail for Count
	A0 FF	LDY	#FF Definite Fail for Count
	C2 30	REP	#30 16-Bit Registers
	8A	TXA	
	8F D8 59 00	STA	0059D8 Store Results
	98	TYA	
	8F D9 59 00	STA	0059D9 Store Results

And the second part is near-identical. I have faith that you could figure it out. (Disassemble it with Copy II Plus) Now then, after a moment of thought, they provided us with a very simple crack. Simply extract the correct nibble count variables via a look at zero page, replace the LDX FF and LDY FF with the correct values, and not only will it pass the checks, but store the correct values as well! Make these edits:

Blk	Byte(s)	From	To
\$4A3	\$43	??	00
	\$4E	02	00
	\$50	??	00
	\$52	FF	AF
	\$54	FF	20
	\$6B	??	00
	\$6D	??	00
	\$6F	FF	5A
	\$71	FF	1E

And don't forget to write it out. By the way, if you don't make these edits, try searching something, it throws you back to the beginning of the game! Like I said, very nasty.

Ralph Supinski

Softkey for...

California Games GS

Epyx

Requirements:
512K Apple Iigs
3.5" Disk Copier
3.5" Disk Editor
Copy II Plus v8.x

Thanks to Brian Troha and his softkey for Destroyer GS (COMPUTIST #54, pg. 23) for the basis for this softkey.

This disk follows previous Epyx schemes in that the program checks for a nibble count on tracks 20 and 21. After copying the disk with Copy II Plus's "COPY DISK W/ FORMAT" option, I searched the disk for A2 20 A0 01 and found the following on block \$0FC:

58:	E2 30	SEP	#30	8 bit wide Accum.
5A:	A2 20	LDX	#20	
5C:	A0 01	LDY	#01	
5E:	5A	PHY		
5F:	DA	PHX		
60:	F4 00 00	PEA	0000	
63:	F4 AA 52	PEA	52AA	
66:	22 93 53 00	JSL	005393	
6A:	8E 9E 52	STX	529E	
6D:	8C 9F 52	STY	52 9F	
70:	A8	TAY		
71:	68	PLA		
72:	68	PLA		
73:	68	PLA		
74:	68	PLA		

```

75: 68      PLA
76: 68      PLA
77: 90 03    BCC 7C {+03}
79: 4C 93 52 JMP 5293
7C: A2 21    LDX #21
7E: A0 01    LDY #01
80: 5A      PHY
81: DA      PHX
82: F4 00 00 PEA 0000
85: F4 AA 52 PEA 52AA
88: 22 93 53 00 JSL 005393
8C: 8D D0 52 STA 52D0
8F: 8E A4 52 STX 52A4
92: 8C A5 52 STY 52A5
95: A8      TAY
96: 68      PLA
97: 68      PLA
98: 68      PLA
99: 68      PLA
9A: 68      PLA
9B: 68      PLA
9C: 90 03    BCC A1 {+03}
9E: 4C 93 52 JMP 5293
A1: C2 30    REP #30
A3: 22 76 53 00 JSL 005376
A7: 28      PLP
A8: FB      XCE
AA: 08      PHP
AB: 18      CLC
AC: FB      XCE
AD: 08      PHP
AE: C2 30    REP #30
B0: A0 FF    LDY #FF
B2: FF AD 9E 52 SBC 529EAD,X
B6: CD A0 52 CMP 52A0
B9: 90 1D    BCC D8 {+1D}
BB: AD 9E 52 LDA 529E
BE: CD A2 52 CMP 52A2
C1: B0 15    BCS D8 {+15}
C3: AD A4 52 LDA 52A4
C6: CD A6 52 CMP 52A6
C9: 90 0D    BCC D8 {+0D}
CB: AD A4 52 LDA 52A4
CE: CD A8 52 CMP 52A8
D1: B0 05    BCS D8 {+05}
D3: 28      PLP
D4: FB      XCE
D5: 28      PLP
D6: 18      CLC
D7: 60      RTS

```

This code starts out like the Destroyer disassembly but immediately goes off on a different tack. With all the pushing and pulling of data to and from the stack and the X and Y registers, I got thoroughly confused and frustrated! I put the disk away until I felt better prepared to tackle it.

When I went back another approach came to mind. I knew the end of the routine was the RTS at \$D7. Starting there I worked back and saw that the BCS and BCC instructions at \$B9, \$C1, \$C9 and \$D1 all branched to the end bypassing the code at \$D3 thru \$D6. I used the technique the Destroyer softkey used to bypass the disk-check routine. I replaced the final BCS (B0 05) at \$D1 with SEP #30 (E2 30). I placed a BRA D1 {+77} at the start of the routine at \$58. That's it! California Games GS is now softkeyed.

All this points up the importance of submitting softkeys with as much info as possible. Even someone like me, with little assembly language proficiency, can apply it to a program and create a successful softkey. I still don't fully understand how the check routine works. Maybe someone could analyze it and fill us in.

1. Copy the 3.5" disk.
2. Make these edits on the copy:

Blk	Byte(s)	From	To
\$FC	\$58	E2 30	80 77
	\$D1	B0 05	E2 30

3. Write the block back to the copy.

Softkey for...

Showoff v1.1 Broderbund

Requirements:
512K Apple IIgs
3.5" Disk Copier
3.5" Disk Editor
Copy II Plus v8.x

Thanks to Stephan Lau and his softkey for ShowOff in Computist #60 Pg. 9 for the basis for this softkey.

This version has the same protection as v1.0. The code to patch

was found on block \$17D by searching for A2 20 A0 01. You will notice that the code is just one block further on the disk and in the same byte position in the buffer. This indicates that some file on the disk before the one containing the check code was lengthened by one block or that the files may have been saved in different order.

1. Copy the 3.5" disk.
2. Make these edits on the copy:

Blk	Byte(s)	From	To
\$17D	\$70	08 E2 30 A2 20	60 E2 30 A2 20

3. Write the block back to the copy.

Softkey for...

Certificate Library vol.1 Springboard

Requirements:

64K Apple II
5.25" Disk Copier that ignores errors such as Locksmith Fast Copy or COPYA

The protection on my copy of Certificate Library Vol. 1 is a nearly blank track \$21 of the type used in nibble count protection schemes. This track is on the front side of both disks. The other tracks and the back sides are normally formatted. The Certificate Maker program checks for these tracks and the cracked disks can only be used with a softkeyed back-up.

Just use Locksmith Fast Copy, Disk Muncher or COPYA with the listed poke installed to copy all sides.

1. Copy front sides of both disks with a copier that ignores the protected track.

Or using COPYA:

```

RUN COPYA .
ctrl C
POKE 929,234           ignore unreadable sectors.
70
RUN

```

2. Copy the back sides with any standard copier.
{?}Has anyone figured out how to put Certificate Maker on a 3.5" disk?

Notes on Altered DOS 3.3 Disk

If you follow the step-by-step (Computist #63 p.17), as I did, and do Step (3) as instructed, you will undo the changes you did in Step (1). When you use Master Create it asks for a disk with the 'master DOS' image to be inserted. It copies this image to the first three tracks of the disk you are mastering. This wipes out the changes by writing over the DOS you put on the disk during the Init.

There are several alternatives:

1. Skip Step 3 and use the disk as a 'slave'.
2. There is a procedure for patching a 'Master DOS' image using Master Create described in "Beneath Apple DOS" in Chapter 7.
3. Or, the way I settled on, use a sector editor to patch a Master DOS disk directly.

Alternative 3 (Step by step)

Use a sector editor such as in Copy II Plus to make the following:

Trk	Sct	Byte	From	To
\$00	\$03	\$25	BC 8C	18 60
		\$42	38	18
		\$88	A8 D0	18 60
\$00	\$08	\$48	38	18

Write these edits back to disk.

Softkey for...

Stickybear Math Xerox Educational Software

Requirements:

48K Apple II or equivalent
5.25 Disk Copier that ignores errors such as Locksmith Fast Copy or COPYA
A disk search utility
A sector editor
A blank disk

In Computist #51 Ralph Augenfeld commented that Stickybear Math seemed to have protection beyond the 'protected sector'. I'm glad to report that is not the case. The reason that the program seems to be further protected is that the real protected sector is not loaded until after the enter your name and you press return to go on to the program. This is where you must break out of the program to find the correct sector.

When my first efforts to softkey 'Math' with the techniques in

Computist #26 failed, I looked at the data that I was writing to the protected sector location on the disk with my sector editor (Copy II+). The data showed some of the text in the enter your name screens. Since the disk, copied to ignore the protected sector error and with no other edits done, would boot to the sign-in screen and then fail to continue, I reasoned that the sector was loaded in on top of the screen data after you hit return. Following the technique and breaking out at the proper point produced a working back-up!

While looking around on the disk it dawned on me that the data to be written to the protected sector should be on the disk in a standard readable form. I searched the disk for the first few bytes of the data to be used and found it at the beginning of a sector. I then used COPY II+ to write that sector to the protected sector location. This variation works on all the Stickybear Series disks I've tried; i.e. Printer, Typing, Town Builder, Reading and Math(1).

1. Run COPYA
2. Break out with Ctrl-C
3. Alter COPY.OBJ to ignore unreadable sectors.
POKE 929,234
4. Delete line 70, then run COPYA again and copy the disk.
70
RUN
NOTE: You can use Locksmith Fast Disk Copy or any copier that ignores errors to accomplish steps 1-4.
5. Boot your disk-search utility and search for 01 60 01 00.
6. The two bytes following the above sequence are the track and sector number, respectively, on disk that the protected sector will be written to. Write them down. (01 0F for 'Math')
7. Skip the next two bytes and look at the bytes after them. These are the low byte (xx) and high byte (XX), respectively, of the memory address the protected sector is loaded to. Write them down. (00 1E for 'Math')
8. Boot your Stickybear disk. On 'Math' remember to enter your name and press return to load in the needed sector.
9. Break out of the program by pressing Ctrl-Reset until the drive stops.
10. Enter the monitor.
CALL-151
11. Enter the address of the protected sector, high byte first then low byte at the monitor prompt.
XXxx *(1E00 for 'Math')*
12. The byte at XXxx will be displayed. Hit return again to display the next 7 bytes. Write these eight bytes down.
13. Boot your sector editor. Search the copied disk for the bytes found in step 12. you should find the bytes at the start of a sector. (track 02, sector 08 for 'Math') Write that sector to the track and sector found in Step 6. (track 01 sector 0F for 'Math')
14. Search the disk for 60 A2 00 0A 00
15. Change the A2 to 60 and write the sector to disk.

Notes on Computist Super Index

The Computist Super Index by I/O Distributing is great! I just got the AppleWorks version and just love it. It consists of three main files, one with softkeys, one with input, articles and programs and the last with APT's, Tip's, and reviews. This database is very complete and has entries for the hints, comments and softkeys that are buried in unrelated letters and comments. Many of these don't show up in the Table of Contents or the listing of back issues.

If you have a complete collection of Computist issues, as I have, or are just trying to find which back-issue to order you'll find CSI indispensable. Being able to do an Open-Apple F search saves time in finding the info you are looking for and it also saves wear and tear on the issues themselves. Thanks to David Hopkins for making CSI available to us. Look for the ads for this wonderful tool in upcoming issues of Computist.

Notes on newer Electronic Arts

'Strike Fleet' and 'Chuck Yeager's AFT' were both released at about the same time as 'Deathlord'. I tried to use the softkey for 'Deathlord' by Blain Johnson in COMPTIST #62 on them. It worked up to a point and probably can be made to work with the correct sector edits or added routines. I hope someone with more skill than I have can complete the softkeys. Here is what I found:
'Chuck Yeager' copied with no problem by following steps 1-7. The sector edits in step 8 matched for the first two lines. The rest of the data did not match.

Trk	Sct	Byte	What I found
\$00	\$01	\$8C-8E	AE FE 02
\$00	\$02	\$3C-3E	20 E6 03

'Strike Fleet' also copied but there were some stray characters sent to the screen during the copy process. Again, the copy had the bytes from the first two sector edits in the correct locations but the rest did not match.

Thanks to Blain Johnson for getting us this far. I hope these notes will prompt him or someone else to extend the technique to similarly formatted EA disks.

Schwarz Adler

This is just a note to say how pleased I am with your periodical. I have found it of irreplaceable value in allowing the use of many programs without worrying about damaging or destroying the original disks. I am very pleased with the attitude of many of the IIGs programs which allow the installation of the program on a hard disk (mine is 62meg).

Of the current protection schemes, I find the key disk least offensive. This is for two reasons. First, it is the simplest to get around (usually), and can thus be lived with. Second, I find it easier to find a disk than to try to match a word from the manual (if I can find it). This second technique is particularly irksome when you pick a wrong word and the program only allows you one try.

My major objection to the key disk scheme is still having to risk the original disk each time I wish to use the program. This can be particularly frustrating when you are in the middle of something and the key disk goes down.

I have a complete set of all your back issues and still find an occasional use for even the earliest of them. Could I add that I much prefer those deprotection hints which tell you what to search for and what it is doing. I find quite often that knowing this information allows me to crack a disk which is closely related to the one in the hint.

Thank you (and all the writers) for your efforts on behalf of those of us who are unable to spend the time to deprotect disks on our own.

Softkey for...

Deja Vu Uninvited Mindscape

In COMPUTIST #64 (p 35), I came across a deprotection scheme for Shadowgate. Having two other games from the same company, I thought the same technique might work for both of them also. Much to my pleasure, the protection was exactly the same on all three disks. You may look on page 35 of issue #64 to get a description of the protection scheme.

First, make sure you are working on a copy of the disk. Never modify the original.

We will first deprotect the sync checks. Search the disk for the string 22 E1 EA 00 B0 07 22 90 E8 00 20 D3 EA. Change the first 6 bytes to AF EA EA EA 80 07. Write back to disk. I found these at block \$076, byte \$9A on all three games.

Now search for the string CD BB BE F0 08 A9. I found it 6 times:

Block Bytes	
\$000D	\$059-05E
\$000E	\$157-15C
\$0023	\$146-14B
\$0024	\$036-03B
\$0024	\$0B1-0B6
\$0024	\$18D-192

In all of these strings, replace the F0 with 80. This will bypass the key disk checks. We however have one more check to disable (according to Dan Halfwit).

To find the last deprotect code, search the disk for 55 E7 70 CD BB BE D0 6B FF 00. I found these in block \$0027, starting at byte \$1ED. Change the 70 and the 6B both to 00. Write the changes back to disk and your copy should run fine.

Bob Igo

Here is some more APT information I have created. Using an updated version of APT Scanner with an "artificial intelligence" option (Well, not really, but it helps focus on the most likely choices.) I scanned the games for the various numbers of fireballs, arrows, ships, and paddles. After that, the rest was easy.

A.P.T. for...

Gemstone Warrior

Unlimited Armaments:

Trk	Sct	Byte	From	To
\$03	\$07	\$FE	DE	BD

Almost Unlimited Hits:

Trk	Sct	Byte	From	To
\$07	\$0C	\$78	ED	6D

\$09	\$0B	\$90	CE	EE
\$09	\$0F	\$91	ED	6D
\$1F	\$0C	\$0E-10	8D 22 68	EA EA EA

Note: Because there are still a few obscure things that can harm you, I've added a little thing that ADDS hit points to you when you're caught in the blast of a fireball, so when your hit points go down, fry yourself.

A.P.T. for...

Arkanoid

Unlimited Paddles:

Trk	Sct	Byte	From	To
\$01	\$04	\$5C-5D	D6 84	EA EA

I've tried to make an APT to select the starting level, but I've had no success. The game loads more data after completing rounds 16, 24, and 32, if that's any help. I was searching with Crucial Code Finder in memory after breaking the program's execution for the series 10 18 20, thinking it would do a LDA \$NNNN,X or something like that to compare it with the current level before deciding whether or not it needs to load again. Like I've always said, there's always someone better than yourself. Okay someone, help me out!

A.P.T. for...

Xevious

Unlimited Ships:

Trk	Sct	Byte	From	To
\$17	\$00	\$18-1A	CE 2B 60	EA EA EA

Now, all you've got to do is enter these in Editor Creator and finally find those gemstones, free the Arkanoid, and do whatever it is you're supposed to be doing in Xevious.

To Jon Peter Tirad: I'm on the case with regard to Dino Eggs. It is a bit different than what I'm used to, but I never give up (Well, not permanently.) Look for it in upcoming issues. If you don't hear from me, I will have died trying. This is on your conscience.

Keep up the good magazine! Unless I get significantly better at video games, you'll be hearing from me again soon.

Ralph M. Faris

Softkey for...

An Apple a Day

Avant-Garde

After reading the article on how to create a DOS 3.3 Altered DOS disk in Computist #63, I decided to make one and try it on the Apple a Day medical diagnostic disk I have had some difficulty deprotecting. Here are the easy steps:

1. Create the Altered DOS 3.3 disk described in Computist #63 and put it aside for the moment.
2. Init a DOS 3.3 disk and delete the hello program. Place this disk in your second drive if you have one.
3. Boot the altered DOS 3.3 disk and brun FID. Remove the altered DOS disk from the drive and insert the original Apple a Day Disk by Avant-Garde.
4. Run the copy files program from the FID program already in memory. When the prompt asks for the file name, type = (wildcard). This will copy all files on the Apple a Day Disk onto your normal DOS 3.3 disk in drive two.

These steps should fully deprotect Apple a Day although you may want to add a fast DOS such as Pronto-DOS or Diversi-DOS. The second "Health Disk" is COPYABLE. Good health to you.

James J. Harvey

Softkey for...

Mathematics Skills Software Series

Addison-Wesley Publishing Company

Requirements:

DOS 3.3 System Master
Copy II+ or other with a Sector Editor

A short time ago, a friend of mine who is a school teacher (I am a retired teacher), brought some math programs to me and ask if I could deprotect them. He said that he was really concerned for the safety of the programs since the computer accesses the disk at various times during the program's operation, and his students have, at times, been rather careless with the disks.

The Addison-Wesley Mathematics Skills Software Series Levels 3, 4, 5, 6, 7, and 8 deals with building math skills for Early and Later Elementary grades.

The Level 7 and 8 programs have two disks, the main one of

which is double sided. The Level 7 program also included a calculator which may be called up onto the screen at any time. A teacher menu and student records are included in all of the programs, and teacher and student records may be printed.

All efforts to copy these programs using EDD4, Locksmith, and Copy II+ failed. However, here is a solution to the problem of making backup copies.

1. Write protect the original program disk.
2. Boot a DOS 3.3 disk and use COPYA to copy the original.
POKE 47426,24 *Ignore errors.*
RUN COPYA
3. Boot your favorite sector editor and scan for BD 8C C0 10 FB C9 E7 D0. You should find this sequence on Track \$00, Sector \$05, starting at Byte \$73, and at Byte \$7C.
4. Sector edit the copy.

Trk	Sct	Byte	From	To
\$00	\$05	\$79	E7	AA
		\$82	E7	AD
		\$AC	38	18

That's it. You now have a deprotected copy. If your original program disk is two-sided, you may straight copy the back side since the back side is not protected.

This should work for other programs in the Addison-Wesley Mathematics Series.

Softkey for...

Rainbow Painter Stickers

Springboard Software, Inc.

Requirements:

DOS 3.3 System Master
Blank Disks
Your favorite sector editor

My compliments to Mr. Clay Harrell, (I admire your expertise—Vol. 63 P. 17-18) who spent a considerable amount of time and effort in the development of his softkey for Rainbow Painter and Stickers. His article was of great interest to me since I had just had a visit from another school teacher friend of mine who wanted a deprotected copy of both of these programs.

I checked both of my friends programs for the codes that were in Mr. Harrell's softkey. In Stickers, I found part of this code only once on Track \$08, Sector \$01, starting at Byte \$92. In Rainbow Painter, I found part of this sequence only once on Track \$09, Sector \$07, starting at Byte \$79. Making the changes to my copies as he suggested did not work. Obviously the versions of my programs were different than the ones he has.

Here is my approach to the problem which was much easier to solve.

1. Boot your DOS 3.3 system disk.
2. Tell DOS to ignore checksum and epilog errors and use COPYA to copy the disk.

POKE 47426,24

RUN COPYA

3. Make the following sector edits to the copy.

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

That's it. You now have a deprotected copy of Stickers and Rainbow Painter.

(?) One last parting remark before I close is a plea for some help. Does anyone know where I may obtain the documentation for The CIA? I would be grateful for the information.

The Home Front

Softkey for...

Micro School Programs Series

Alphabet Read Along
Alphakey

Counting Read Along
Essential Math Grade 1
Essential Math Grade 2
Essential Math Grade 3
Essential Math Grade 4
Essential Math Grade 5
Essential Math Grade 6
Essential Math Grade 7
Essential Math Grade 8

Facts Match
Feet Read Along

- Homonyms, Synonyms & Antonyms Grade 1
- Homonyms, Synonyms & Antonyms Grade 2
- Homonyms, Synonyms & Antonyms Grade 3
- Homonyms, Synonyms & Antonyms Grade 4
- Homonyms, Synonyms & Antonyms Grade 5
- Homonyms, Synonyms & Antonyms Grade 6
- Homonyms, Synonyms & Antonyms Grade 7
- Homonyms, Synonyms & Antonyms Grade 8

Math Activities

Math Facts Games

Number Cruncher

Number Match

Number Match It

Parts of Speech I & II

Punctuation & Caps

Spelling Grade 1

Spelling Grade 2

Spelling Grade 3

Spelling Grade 4

Spelling Grade 5

Spelling Grade 6

Spelling Grade 7

Spelling Grade 8

Story Mix 1

Story Mix 2

Story Mix 3

Story Mix 4

Story Mix 5

Story Mix 6

Telling Time (Analog and Digital)

Word Picture

Educational Software Center/Berta-Max

Requirements:

- DOS 3.3 Master Disk (or COPY II+)
- One blank- or expendable disk per program
- RWTS Worm (Issue #61, Page 35)
- Super IOB 1.5 (Issue #32, Page 17)
- Newswap Controller (Issue #32, Page 20)
- Speed-up DOS (optional, but almost a necessity)

After having deprotected several of the programs, it is reasonable to surmise at this juncture that all of the aforementioned programs probably use the same (type of) copy protection, which very likely may be changed after this is published. (It's a big job, but somebody's got to do it, Max!) The programs are nicely done, with a mix of hi-res and mostly lo-res graphics; there is one problem - the program disks are copy protected! The company's back-up disk policy remains unenlightened, since a back-up disk would cost more than an entire complete program! My bit copier stumbled over these villains somewhat, so a total deprotection was in order here.

Moving right along, here is the step-by-step.

1. Boot your DOS 3.3 Master, and install the RWTS Worm as instructed (nice job, Jim Hart, it works great!). Boot the write-protected Micro School Program disk, capture the foreign RWTS, and save it on the same disk on which SUPER IOB 1.5 is located.

BSAVE program name.RWTS, A\$1900, L\$800

2. Install the NEWSWAP controller into SUPER IOB 1.5, and copy from DRIVE 1 to DRIVE 2; when asked whether to INITIALIZE the disk in DRIVE 2, answer Y.

3. Boot your DOS 3.3 Master disk once more.

BRUN MASTER CREATE

Insert the copied disk, and specify HELLO as the program name. As an alternative, also use COPY II+ to copy a standard DOS onto this disk, and then invoke the CHANGE BOOT PROGRAM function.

4. Remove the code that causes reset to reboot the program. NOTE: Some of the programs use code to cause a reboot when reset, and others use code to run the HELLO program when reset. Still others cause a reset to be nullified, and possibly perform additional unneighborly acts, but from what I've seen so far, the offending code very likely will be found in LINE 2 of the Applesoft HELLO program. Look for some out-of-place POKES early on in the HELLO program. The reboot code is "POKE 1012,0: POKE 214,128" and the return to HELLO program code is "POKE 40286,102: POKE 40287,213".

LOAD HELLO

2

SAVE HELLO

The original copy-protected program had a speed-up DOS, but was lost when deprotection took place, so...if you have one available, installing a speed-up DOS at this time will make things even nicer (Diversi-DOS works fine, others most likely will too).

That's it! To all you teachers out there, store the original in the school safe, and enjoy the programs without fear of the peanut butter & jelly syndrome taking over.

Anyway, it was developed in Seattle, and then it was cracked in Seattle without remorse or spite. However, there were some mixed emotions after having accomplished it — Joy and Happiness!

Charles E. Garrett

I continue to enjoy your excellent magazine and look forward to its arrival each month. Most of the instructions are over my head but as I read and try to figure them out, I learn a little each month. I had just acquired a new THEXDER and decided to attempt a couple of tricks described in COMPUTIST #62. My first try was to give the robot unlimited energy. Much to my chagrin, when I was in BASIC and typed in the first line "PREFIX THEXDER" and hit return, I received a "Syntax Error". Does anyone know what I did wrong? As far as I can see, I followed the instructions exactly.

I next tried to make "Thexder" bootable as described by "Mountain Man". I was going great until I got to step 8 which is: "copy the files TOOL.SETUP and SOUND.INIT from the SYSTEM/SYSTEM SETUP subdirectory of your system disk". I have two system disks. The first is version 2.0 which came with my Apple IIgs, the other is version 4.0 and was mailed to me shortly after I purchased the computer. Which one do I use?

My THEXDER disk is not copy-protected. The instructions tell you to make a back-up copy and show you how to do it. Some of the publishers are learning.

The Hardcore Computists

BASIC Protection Schemes

Applesoft BASIC is a nice language to work with simply because most people can follow the flow of the program. Many times you will see an article in COMPUTIST where the BASIC program needs to be changed. The reason for these changes is that some, if not all, of the protection was incorporated into the BASIC code. BASIC protection comes in two categories: Peeks, pokes or calls to DOS and tricks with the program listings. If you have been reading along in COMPUTIST you have noticed that the first thing everybody does is place an 18 into memory location \$B942, to ignore the epilogs. But suppose the first line of a program read "10 Poke 47426,54" (Hex \$B942:38). This would restore the original value and negate your DOS poke. The protectors can even poke the prologs and epilogs back to the protected values. Similarly any changes you make to the disk can be fixed in a BASIC program. Therefore, you should always question any poke or peek in the 40,000 or above range. It is within that range that DOS lives. If DOS is running then why would you need to change it or look at it? What you must do is to learn to question the BASIC listing as you would the assembly code.

Since you have all gone out and purchased the HEX to DEC calculator (?) and the Beneath Apple DOS book (BAD) this one will be a snap. I ran across this piece of code in a program. On error it went to a line which said:

```
400 CALL PEEK(40222) + PEEK(40223) * 256 + 1
```

If you substitute a PRINT for the CALL you see that the actual memory location called was 42319 which is in DOS. (remember always question CALLS in the 40000 and above range). The BAD book says that this is the area of DOS responsible for INITing the disk (Hex \$A54F). Interesting, if an error occurs the disk formats itself. That should stop prying eyes! Here are some other interesting locations that can be PEEKed or POKEd:

- 103-104 - Start location for BASIC programs. (Hex \$67-68)
- 175-176 - Pointer to end of Applesoft program. (Hex \$AF-B0)
- 214 - Run flag. Try loading a BASIC program and adding POKE 214,255. Ctrl-C will no longer stop the program. (Hex \$D6)
- 222 - Holds the number of the error type (Hex \$DE). 4 = write protected, 6 = file not found, 7 = volume mismatch, 255 = ctrl-C was pressed
- 1010-1012 - The Reset vector (Hex \$3F2-3F4)
- 1013-1015 - The Ampersand vector (Hex \$3F5-3F7)
- 1016-1018 - The ctrl-Y vector (Hex \$3F8-3FA)

Other little tricks include a program line that has a ctrl-D as the 34th character of the line. When you list that line Applesoft tries to execute a DOS command and stops the listing.

```
10 PRINT "BET YOU CAN'T LIST THIS* LINE"
```

Now replace the "*" with a ctrl-D

If you try to list a program and it stops cold, try a LIST 10- (to start the listing with line 10) or a LIST 20-. Also you should look

for lines that can never be executed. Just like a false disassembly in the monitor, extra lines can be added to BASIC to confuse you. There is one item that will allow you to examine a BASIC listing with ease; Debug by Beagle Bros. This program loads then when you load an Applesoft program you can instantly find all the CALLS or POKES or GOSUBS. Of course you can examine a program without DEBUG, it will simply require more time on your part. If there are pokes or peeks or calls that you do not understand, you should question them. Also, remember a machine language program can be loaded and called from a BASIC program. Have you ever seen:

```
FOR A = 768 TO 800: READ B: POKE A, B: NEXT A:
CALL 768
```

What this is doing is reading Data statements and constructing an assembly program and poking it directly into memory. To discover what the CALL 768 (Hex \$300) does, replace it with an END, run the program then list \$300 (300L) in the monitor. I have seen programs that load a "check the protection" file and then call it. I think these BASIC protection schemes are the easiest to deal with but like all protection schemes they take time to figure out.

Apple has a feature to see what lines are executing and what files are loading. Try adding these lines to the beginning of any Applesoft program:

```
1 TRACE : REM SHOW LINE NUMBERS AS THEY RUN
2 PRINT CHR$(4) "MONC, I, O" : REM SHOW ALL
FILE ACCESS
and optionally
3 PR#1: REM PRINT THE RESULTS
```

The MON command is not a Applesoft command, it is a DOS command. These BASIC lines will only work under DOS 3.3. because ProDOS does not support the MON command.RDEXed

Typing RUN from this point will kick on the printer list the lines as the are run and list all files being loaded or read. I would run this without line #3. Once I tried this and the program was simply one delay loop after another. FOR I=1 TO 4000:NEXT I, will print 4000 lines on the printer, so be careful when using line #3. What you have after this is finished is a listing of each line, and command, as the program executed. I should also warn you that the listing may be confusing at first, for instance:

```
10 PRINT:PRINT:GOTO 1200
```

Will TRACE as #10 #10 #10 #1200 since there are actually three commands in line 10, then 1200 is the next line executed.

It is also worth mentioning that a BASIC program starts at \$801 in memory. It is possible to have a program that starts later in the 800's and is still in BASIC, but cannot be listed. Here is where the theory comes into play. I cannot give you an example of when to try this, but if you remember what I am about to write it may help you when you are lost in deprotecting a disk. For this example it will be necessary to load a BASIC program and jump into the monitor. Now list \$801 and you should see code immediately from that point. The code at \$801-802 is telling the computer where the BASIC program starts. I have a disk where \$800 through \$844 are zeroed out. From the BASIC prompt if you type list, no listing scrolls up. But typing a "1 REM" and entering the monitor will restore the \$801-802 code. Then if we change \$801 from \$01 to a \$45 (where the other code starts, we can return to BASIC and list all of the program that was obscured.

The bottom line is; question any and all parts of the listing that you do not understand. When you do understand what the program is doing then the protection will be evident.

Putting this to a practical use, The Ie game Pirates by Microprose was deprotected in COMPUTIST #61. But, while the softkey produced a COPYA copy there was still the "look in the manual" protection scheme. The game asks when the silver train or fleet arrives in a certain city. If you guess wrong, then you cannot win the ensuing sword fight and are sent back to start over.

Softkey for...

Pirates

Microprose

To finish the deprotection, load a ProDOS that you can ctrl-C out of, one with BASIC.SYSTEM. Place your deprotected copy of Pirates in the drive and type:

LOAD PICK

LIST 1250

(you should see)

```
1250 POKE A0, PEEK (PR+128) : POKE A1, 63 : CALL
CA:A=CT+CL* PEEK (A2) : GOSUB 2950 : COS="THE
SILVER TRAIN": POKE A0, PEEK (PR+128) : POKE
A1, 64 : CALL CA : IF PEEK (A2) THEN COS = "THE
TREASURE FLEET"
```

Since we are trying to find where the program checks for the silver train, this is the place to start. Especially since the phrase "silver train" is right before us. The next line (line 1270) ends with a return. A good guess would be that somewhere in the program is a GOSUB 1250. After a bit of searching I located a GOSUB 1250 in line 927.

```
927 ZV = NC : GOSUB 7 : GOSUB 12950 : GOSUB
```

5000:GOSUB 1250

The next program line after 927 said "Turn the disk over", which is what you are able to do after you get past all the checks. By changing 927 to read:

927 ZV = NC:GOSUB 7:GOSUB 12950:GOSUB 5000

The program runs fine and the need for the "look in the manual" has been eliminated. Now Pirates has been fully deprotected.

Another nifty BASIC protection scheme is used by Davidson and Assoc. On their disks the HELLO file is encoded several times to obscure the true program. Load and list the HELLO program and you will see a POKE 104,32. What this is doing is telling the computer that the BASIC program starts at a location different from the usual starting place. So if we POKE 104,32 and list again, you will see that the listing has indeed changed. Again there is another poke to 104, this time with a 64. What becomes obvious is that the developers did not want this to be readily listable. That should set off the protection warning bells in your computer. Especially since the hidden code peeks at memory location 40324 (in the DOS range). (COMPUTISTS #'s 39,53 and 61 address Davidson & Assoc). After reading the articles you will notice that the hidden code actually was hidden protection.

In closing, these were just a few of the things that can be done to a BASIC program. The next time you read a softkey and they change a BASIC listing, try to locate that program and see exactly what was done. The more you inquire the better you will become.

As always, if there is a topic that you would like us to discuss, please let us know.

SkyPhantom

Last month, I was finally able to write to COMPUTIST. In my letter, I asked for help deprotecting various games. Lo and behold, if I had waited a few days I would have received COMPUTIST #64 which had some of the cracks I needed! Well, I would like to report that the protection scheme on ShadowGate (by Mindscape) is the same protection used on Deja Vu and Uninvited, also by Mindscape. The softkey for ShadowGate (COMPUTIST #64, page 35) can also be used on those two programs. Here are some additional cracks I have come up with:

Softkey for...

Impossible Mission II (Ile)

Epyx

Requirements:

- 128K Apple IIe/IIc/IIgs
5 1/4" disk copier (I used Copy II Plus)
5 1/4" sector editor (I used Copy II Plus)
2 blank disk sides

Mission II is a sequel to the previous game, Impossible Mission. The goal is basically the same, you must find clues that lead you to a diabolical man named Elvin. Find your way through a maze of rooms to gather the clues.

The protection scheme is the same routine that is used on most Epyx games. The deprotection involves NOPping a few branches and changing the nibble count routine. Here is some code that needs to be changed:

Track \$00, Sector \$05:
041:C9 E7 CMP #E7
043:D0 F4 BNE 039 {-0C} branch to bomb
045:BD 8C C0 LDA C08C,X
048:10 FB BPL 045 {-05}
04A:C9 E7 CMP #E7
04C:D0 4A BNE 098 {+4A}branch to bomb
04E:BD 8C C0 LDA C08C,X
051:10 FB BPL 04E {-05}
053:C9 E7 CMP #E7
055:D0 41 BNE 098 {+41}branch to bomb

Later in the sector...

066:C9 EE CMP #EE
068:D0 F4 BNE 05E {-05}
06A:EA NOP
06B:EA NOP
06C:A0 07 LDY #07 beginning of routine
06E:BD 8C C0 LDA C08C,X

- 1. Boot into DOS 3.3 with a system master disk.
2. Disable DOS error checking routines and run COPYA to copy both sides.
POKE 47426,24
RUN COPYA

- 3. Make the following sector edits to side one:

Trk Sct Byte 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

- 4. Be sure to write the changes back to the disk.

Softkey for...

Who Framed Roger Rabbit?(Ile)

Beuna Vista

Requirements:

- 128K Apple IIe/IIc/IIgs
5 1/4" disk copier (I used Copy II Plus)
5 1/4" sector editor (I used Copy II Plus)
4 blank disk sides

Who Framed Roger Rabbit? (WFRR) is a delightful game based on the movie of the same name. There are various arcade sequences one has to go through to complete the game. After each sequence, the player must look up a code word in the "Gag Book" included with the game.

When I heard from my various sources about WFRR, I received information that the disk was not copy protected. When I purchased the disk, however, I was greeted with a different story. Upon booting a copy of the disk, the disk would seem to start loading and then would kick to the ProDOS quit routine! It was time to set out deprotecting this disk.

After searching around on the disk, I found the following code:

043:8D EB 16 STA 16EB
046:20 00 1B JSR 1B00 check the disk
049:90 03 BCC 043 {+03}if not copy, goto 04B
04B:4C 3C 1A JMP 1A3C otherwise jump to quit
04E:20 9B 19 JSR 199B continue loading

Here is a good place to demonstrate that copy protection schemes can be eliminated in more than one way. It is possible to either force the branch at 049 to jump to 04E via a Branch on Carry Set or just NOP out the JuMP to the quit routine. I chose the latter.

- 1. Copy the disks with any fast copy program.
2. Make the following edits to disk one:

Trk Sct Byte From To
\$1E \$01 \$4B-4D 4C 3C 1A EA EA EA

- 3. Make sure to write the changes back to the disk.

Softkey for...

Talking Stickybear Alphabet (IIgs)

Weekly Reader

Requirements:

- 512K Apple IIgs
3 1/2" disk copier (I used Copy II Plus)
3 1/2" disk editor (I used Copy II Plus)
2 blank disks

Talking Stickybear Alphabet is a take-off of the popular Stickybear Alphabet for the Ile. However, the new GS version includes better graphics and a TALKING Stickybear. If you enjoy just watching Stickybear, wait till you hear him! A child presses a letter and a screen loads up with a picture of an item starting with that letter. Stickybear then says the letter and the object. The child can then repeat the words, if he/she so desires.

The second disk is not protected at all and can be copied with any fast copier (Copy II Plus). The first disk, however, seems to have an unformatted (or abnormal) track. When using a copy program to copy the first disk, allow the program to continue through the errors (blocks \$54-5F).

Now that the disk was in a copyable format, it was time to check for copy protection. I booted the disk and the ProDOS screen appeared. Stickybear came on, welcomed me to his program, and the program died. I loaded Copy II Plus and set the SCAN mode of the sector editor. I scanned for \$22 A1 00 E8 22 (the ProDOS block check command) and found the following code on block \$0FE, byte \$020:

020: 22 A8 00 E1 JSL E100A8 start of routine
024: 20 00 0020 setup codes for ProDOS
026: 01 19 02 00 00021901
02A: 90 05 BCC 031 {+05} if carry clear, goto 031
02C: 20 DC 18 JSR 18DC otherwise jump to 18DC
02F: 80 EF BRA 020 {-11} and branch to start
031: AD 05 19 LDA 1905 load accumulator
034: 8D 0F 19 STA 190F transfer contents
037: 22 A8 00 E1 JSL E100A8 perform actual check
03B: 22 00 0022 ProDOS code for check
03D: 0F 19 02 00 0002190F
041: B0 02 BCS 045 {+02} if carry set, goto 045
043: 80 DB BRA 020 {-25} or branch to start
045: 60 RTS return to caller

I placed a \$00 (break) command at the beginning of the block check routine and rebooted the disk. This time, after Stickybear welcomed me I was placed in the monitor. I pressed ctrl-T, (return) to clear the graphics screen and was left with the address the program had died at, namely \$02/18B6.

When I disassembled the surrounding code it turned out to be the code I had found near the ProDOS block check command on the disk. Using the SCAN command of the GS monitor (\?? ?? ?\?bank/addr.addrP), I searched for any calls to the location of the block check routine. As it turns out, a Jump to this SubRoutine (\$20 B6 18) was found at \$02/30A. All that was left to do was scan for this JSR on the disk and NOP it out. The second set of edits is probably not needed, but I included it just in case the program calls the routine somewhere else along the line.

- 1. Copy the disks with any 3 1/2" disk copier that will continue on errors (ignore all errors on blocks \$54-5F)

- 2. Make the following sector edits to disk one:

Blk Byte(s) From To
\$00F4 \$14F-151 20 B6 18 EA EA EA
\$00FE \$037-03B 22 A8 00 E1 22 AF A8 00 E1 60

- 3. Be sure to write the changes back to the disk.

The Executioner

This month's notes are from wandering around in the monitor aimlessly on a boring day. On the GS, when you restart the system (press ctrl-OA-reset, etc.), type "call-151" to enter the monitor, and press return. Type the address "FF/BB11" and press return a few times. After a while, read what is on the right 1/3 of the screen; it is the copyright info; but you will also notice the name of perhaps one of the designers of the computer?, Fern Bachman Jr.? Following that, though is a copyright for Microsoft, in 1977?!? Microsoft is the company, correct me if I'm wrong, that makes MS-DOS for the IBM. Also, at memory location "FF/C761", there are some more names. I think these are the designers; Greg Seitz, Peter Richert, and Ed Lai. To see the 5 1/4 drive light up, type COE8, the command to stop the drive. To hear a click, type C030. Other comments:

Fingerprint GSi v.II is excellent, even though I can't tell the difference from v.I

Those of you without Fingerprint and with Deluxe Paint II, copy the screen saver file (CDA) from the desk accessory menu to the desk accessory menu of any other program you like, such as the system master, and whenever you get a super hi-res screen that you like, press ctrl-OA-esc and choose the option "EA Screen Saver", but remember, the disk that you save the file on must have the same pathname as the disk that you loaded up. If you can't access the classic desk accessory menu, you might want to restart your program by pressing ctrl-reset until you get a cursor, and from there, you can access the CDA menu.

{?}Does anyone know what to with Frank Snari's card, or how to get into the tower, or even through the gate with the nose and eye in Tass Times in Tone Town?

{?}And finally, can someone suggest a good program where I can enter a word list with French words and have a question or fill in the blank for French students to use?

One last note, the least expensive 3.5" disks that I could find (at 79 cents each) are from:

MEI/Micro Electronics, Inc.
1100 Steelwood Road
Columbus, OH 43212-9972

Francesco Panizzon

Softkey for...

Battlezone

Atarisoft

Requirements:

- Super IOB
sector editor

Battlezone is a tank game which is the home computer version of the arcade original. A similar game, Stellar 7, has superior graphics, but is much more difficult and you are given only 1 life. Battlezone is easier and you are given 5 lives.

Experts may skip to the end of the article for the cookbook method. The following is for beginners: The first thing that I tried was COPYA which didn't work giving an "Unable to Read" message. The next thing I did was boot Bag of Tricks, and use the (T)rax option to examine the prologs and epilogs. Tracks 0 and 2 to 34 all had modified epilogs. The address and data epilogs were AA DE instead of the standard DE AA. However, Bag of Tricks could not read track 1, giving an "Unable to Interpret Data" message.interesting....

Next I was ran "Diskview" from the Best Of Hardcore COMPUTIST disk. It read in track 1 and upon browsing the buffer, I found that only one sector existed. No wonder Bag of Tricks couldn't read it, track 1 was empty except for 1 sector. The address part of the sector read:

D5 AA 96 FF FE AA AB AA AA FF FF AA DE

Breaking this up, you'll find:

D5 AA 96 address prolog
FF FE volume number in 4+4 Coding

AA AB track number in 4+4 coding
 AA AA sector number in 4+4 coding
 FF FF checksum
 AA DE non-standard address epilogs

Looking at the 4+4 conversion chart in "Best of Hardcore Computist" magazine, the track is 1 and the sector is 0.

At this point, we know what has to be done. Read from the original disk ignoring epilogs and write to the copy using standard epilogs. Format track 1 on the copy. When reading track 1 from the original, only read sector 0. When writing track 1 to the copy, only write sector 0.

I decided to produce a controller that would do this work for me. After running the controller, I booted the copy but no luck. The disk drive would whir then click, click then whir then click, click, etc. I thought perhaps a signature was in the way of success, so next, I booted Copy II Plus to use the (S)can for bytes option. What do we scan for? Refer to the article in COMPUTIST #63 called "Deactivating Signature Checks" by Edward Teach.

I scanned for occurrences of "8C C0" which is read a byte from disk. I found it once on track \$00, sector \$03, seven times on track \$00, sector \$05, six times on track \$00, sector \$06, eight times on track \$00, sector \$07, twice on track \$00, sector \$08, and once on track \$03, sector \$0C. The next step was to (L)ist the code and (D)ump all the sectors to the printer.

I found this code on track 0, sector 5:

```
BC 8C C0 LDA $C08C,X
10 FB BPL $09E6
C9 AA CMP #$AA
D0 0C BNE $09FB
EA NOP
BD 8C C0 LDA $C08C,X
10 FB BPL $09F0
C9 DE CMP #$DE
D0 02 BNE $09FB
```

My educated guess told me that this was the routine that read the epilogs. You'll notice that it reads the AA first then the DE. I decided to swap these values so that it would read DE then AA. I made the sector edits and booted the disk, but got the same results, the drive spins endlessly.

More examination of the code revealed the following on track 0, sector 6:

```
BD 8C C0 LDA $C08C,X
10 FB BPL $09C2
C9 AA CMP #$AA
```

Another educated guess told me that the AA must be changed to a DE. Why? Because the disk has its own DOS and expects to find the non-standard epilogs. But we will change it's DOS to look for the standard epilogs.

I booted the disk and *success!*

The last job in deprotection is to test it. I've played the game for hours, trying all the options; 1- or 2 players, keyboard or joystick, sound on or off, etc. It passed all the tests and I'm convinced that this is a complete softkey.

In this case, it turns out that there was no signature check. Sometimes you get lucky. I hope this helps you beginners and sheds some light on the "tools" needed in the art of deprotection. I have been computing for 7 years and just now am getting into softkeying, and it still amazes me how changing a few bytes makes a world of difference.

The Cookbook Method

1. Copy Battlezone using the controller at the end of this article. Answer "YES" when asked if you want the disk formatted.

2. Do the following sector edits:

Trk	Sct	Byte	From	To
0	5	EC	AA	DE
0	5	F6	DE	AA
0	6	C8	AA	DE

3. Write the sectors back to disk and enjoy.

Controller

```
1000 REM BATTLEZONE
1010 TK = 0:ST = 0:LT = 35:CD = WR
1011 GOSUB 160
1020 T1 = TK:GOSUB 490
1021 IF TK = 1 THEN GOTO 1110
1030 GOSUB 430:GOSUB 100:ST = ST + 1:IF ST
< DOS THEN 1030
1040 IF BF THEN 1060
1050 ST = 0:TK = TK + 1:IF TK < LT THEN 1021
1060 GOSUB 490:TK = T1:ST = 0
1061 IF TK = 1 THEN GOTO 1120
1070 GOSUB 430:GOSUB 100:ST = ST + 1:IF ST
< DOS THEN 1070
1080 ST = 0:TK = TK + 1:IF BF = 0 AND TK <
LT THEN 1061
1090 IF TK < LT THEN 1020
```

```
1100 HOME : PRINT : PRINT "DONE WITH COPY" :
END
1110 GOSUB 430:GOSUB 100:GOTO 1050
1120 GOSUB 430:GOSUB 100:GOTO 1080
```

Checksums

1000-\$356B	1040-\$17EA	1090-\$203B
1010-\$3266	1050-\$1CE2	1100-\$45AB
1011-\$18F4	1060-\$A74F	1110-\$6B6D
1020-\$D3B0	1061-\$361E	1120-\$DB55
1021-\$0590	1070-\$3E1B	
1030-\$1391	1080-\$B109	

Computist in Colorado

Help to Finish Incomplete Animate Softkey

Previous softkeys were printed in COMPUTIST #49, p 20 & COMPUTIST #54, p. 25.

This is an incomplete softkey for Animate by Broderbund that goes a little further in deprotecting than the previous ones above. You can do everything in the program up to saving CHARACTER files (perhaps some other type of files, too, I don't know because I became discouraged at this point).

After scrupulously following the directions in COMPUTIST #49 p20, my copy still was not completely deprotected. The softkey worked up to the "Scene Designer" module (which is a very important part of the program that is accessed from the "Tools" menu in the opening "Graphic Designer" module, Side B). At that point, the program gave a "ProDOS Error:". It also said, "Incompatible ProDOS Version". Then, if you press any key it changes to "ProDOS Error: Invalid Name Syntax", and hung up until Reset. On the original disk, the "Tools" menu loads up the "Scene Designer" and smoothly goes into that module.

I then used the softkey in COMPUTIST #54 p25, for Side B only. The Scene Designer worked! However, if you choose Draw, from the Tools menu, the disk reboots. My next move was to use CopyII+ to view the files with Disk Map. I found the Draw file to be at tracks \$02 and \$03. Then, using the CopyII Sector Editor, I scanned for the jump bytes, (6C F2 03). They were at track \$02, sector \$0A and track \$03, sector \$03.

After writing in EA's for the jumps, the program seemed to work up to trying to save a Character file from the File menu. The program freezes up and gives a continuous humm. I scanned for bytes (AD 30 C0)... a load to the speaker location-C030. Here are the approximate locations and file names of data areas that contain the speaker location-C030 (SIDE B):

File	Track	Sector(s)
?	00	0E
CHR/SCR?	09	02
ADDCHR	11	02
SCNOPT	11	03
PLACE	13	08
WATCH	14	00/01/0F
PASTE	15	04/05
REMOV	17	0C/0D
TEXT	18	00/0E
EDIT	19	0C/0D
DUMP	1F	0A/0B
SOUND FILES?	1A	02/03
	1F	0A/0B

At this point, I could not find how to bypass the code that gives the humm and prevents the Character files from being saved. Perhaps other options in the program are also stopped by the same code used in the Character option. As I said, I didn't go on from that point...yet.

{?}So, does anyone know how to complete the softkey?

Step by Step (so far)

1. From COMPUTIST #49. For Side A of the Animate Program Disk, do the following:

```
LOAD COPYA
CALL-151
B925:18 60
B988:18 60
BE48:18
B8FE:00
3D0G
RUN
```

2. Use a sector editor, (such as Copy II+), to do the following edits to Side A only:

Trk	Sct	Byte	From	To
\$00	\$01	\$03	4C 9E 81	EA EA EA
		\$90	4C 9E 81	EA EA EA
\$07	\$00	\$DA	4C 42 0A	EA EA EA
		\$62	20 89 0A	EA EA EA

3. (From COMPUTIST #54.) For Side B, type the following controller and save it on your Super IOB disk (DOS 3.3). Then load Super IOB 1.5, merge the controller and copy Side B.

Controller

```
1000 REM ANIMATE (SIDE B)
1010 TK = 0:LT = 35:ST = 15:LS = 15:CD =
WR:FAST = 1
1020 POKE 47426,24:GOSUB 490:GOSUB 610
1030 POKE 47426,56:GOSUB 490:T1 = TK:TK =
PEEK (TRK) - 1
1035 RESTORE :GOSUB 310:TK = T1:GOSUB 610
1040 IF PEEK (TRK) = LT THEN 1060
1050 TK = PEEK (TRK):ST = PEEK (SCT):GOTO
1020
1060 HOME : PRINT "COPY DONE" : END
5000 DATA 30CHANGES
5010 DATA 2,0,137,240
5020 DATA 2,0,138,1
5030 DATA 15,11,51,18
```

Checksums

1000-\$356B	1035-\$27AB	5000-\$5CDF
1010-\$2544	1040-\$4EF4	5010-\$8CBB
1020-\$B5FB	1050-\$C5EF	5020-\$7543
1030-\$580E	1060-\$0CB0	5030-\$EF49

4. Change some bytes on Side B:

Trk	Sct	Byte	From	To
\$02	\$0A	\$47	6C F2 03	EA EA EA
\$03	\$03	\$18	6C F2 03	EA EA EA

Note to Broderbund: I only want a back-up copy that doesn't cost me \$15 extra. I already paid \$50 plus tax, for your program. Why do you want to bleed me so? If you offered a back-up at no charge, like you did for Fantavision, I would have no reason to deprotect your programs.

Vincent Andrews

Softkey for...

Dungeon Masters Assistant volume1: Encounters

SSI

Here is a Super IOB controller that will deactivate the documentation check of Dungeon Masters Assistant vol 1: Encounters. If you have this game and don't like the documentation feature, just boot your favorite sector editor and search for 4C DF 11. Change these bytes to 4C 00 A8. I found them at track \$02, sector \$0B, byte \$49-4B. Now, all you have to do is BOOT and press return during the documentation check to enjoy the game.

Controller

```
1000 REM DUNGEON MASTERS ASSISTANT VOLUME
1:ENCOUNTERS
1010 TK = 0:ST = 0:LT = 35:CD = WR
1020 T1 = TK:GOSUB 490
1030 GOSUB 430:GOSUB 100:ST = ST + 1:IF ST
< DOS THEN 1030
1040 GOSUB 310:RESTORE :IF BF THEN 1060
1050 ST = 0:TK = TK + 1:IF TK < LT THEN 1030
1060 GOSUB 490:TK = T1:ST = 0
1070 GOSUB 430:GOSUB 100:ST = ST + 1:IF ST
< DOS THEN 1070
1080 ST = 0:TK = TK + 1:IF BF = 0 AND TK <
LT THEN 1070
1090 IF TK < LT THEN 1020
1100 HOME : PRINT "DONE WITH COPY" : END
1110 DATA 20CHANGES
1120 DATA 2,11,74,0,2,11,75,168
```

Checksums

1000-\$356B	1050-\$6C4E	1100-\$56AA
1010-\$3266	1060-\$EB3F	1110-\$7190
1020-\$C11A	1070-\$E33A	1120-\$ED3D
1030-\$D71B	1080-\$9397	
1040-\$6EA5	1090-\$8261	

Lewis D. Kauffman

Softkey for...

Basic Electricity #8010E Digital Codes and Numbering Systems #8700E

Bergwall

Requirements:

Blank disks initialized with DOS 3.3 and with the hello program deleted

Super IOB from Starter Kit

RWTS Worm program from COMPUTIST #61 pp 35

Some time ago our school purchased two Electronics Software Programs from Bergwall. These programs do an excellent

job supplementing my current lessons and the students enjoy the mix of graphics and instructions.

I know Bergwall has a liberal replacement policy for damaged or defective disks but I still hated to hand out original disks. The problem was all attempts to backup these disks left me frustrated. I might add, it didn't take long until I had the opportunity to take advantage of that replacement policy.

Having been a subscriber to COMPUTIST for over two years, I figured it was about time to put the things I had learned to work for me.

Careful nibble inspection of the disks with COPY II+ showed the disks had altered epilogue in both the address and data areas (DE AA changed to C9 AA). Unfortunately, these changes were not in every sector on every track. It seemed to me I could use the Copy II+ Sector Editor and custom patch it to defeat the error checks and read the altered epilogue. It didn't work.

After several days of researching the back issues of COMPUTIST and comparing other contributors problems, I figured the best course might be to use Super IOB and a Swap Controller.

I'm not sure if my inexperience with deprotection procedures or just plain stupidity caused me to have problems but the Super IOB with the Newswap.con installed caused the screen to blank and my computer to hang (Apple IIgs with 1.2M memory).

This was just about more than I could take. However, another blown disk renewed my determination to deprotect the disk. So, returning to COMPUTIST again, I stumbled across the answer.

There, in issue #61 page 35, was another method of capturing the RWTS contributed by Mr. Jim Hart- the RWTS Worm. Thank you Mr. Hart!! Following his instructions, I could successfully obtain an unprotected copy of my disks.

Here is the step-by-step procedure that worked for me:

1. If you haven't already typed in the RWTS Worm, do so and save it to your Super IOB disk. I used the COMPUTIST Starter Kit.
2. Initialize (with DOS 3.3) as many blank disks as you'll need for the copies. Delete the Hello program from each disk.
Note: You must use Slot 6 for these steps.
3. Boot any DOS 3.3 disk. Remove the disk. Type:
NEW
4. Insert the disk that has the RWTS Worm program. Load the program by typing:
BLOAD RWTS WORM, A\$9500
5. Remove the disk with RWTS Worm and insert one of the Bergwall disks.
6. Run the RWTS Worm. (If you are in the monitor, type 9500G.)
CALL 38144
7. When the drive shuts off, remove the Bergwall disk.
8. Insert the disk that contains your Super IOB and save the RWTS. Replace the "XXX" with whatever name you want.
BSAVE RWTS.XXX, A\$1900, L\$800
9. Boot (Control-Open Apple-Reset) your Super IOB disk.
10. When you get the BASIC prompt "J", type:
LOAD SUPER IOB
EXEC NEWSWAP.CON
11. Change line 10010 in the controller to match the name of the program you used for "XXX" in step 8.
12. Start Super IOB and follow the instruction prompts to make a copy of the Bergwall disk.

RUN

The Bergwall software packages each contained several disks. Each disk must be copied with the original disk's RWTS.

The deprotected disks can now be COPYAed and edited. The copies of Digital Codes and Numbering Systems #8700E- copyrighted 1985- required some modifications. Catalog the disks and find the file named "Bergwall Hello". LOAD the file and LIST it. On line 110 you should find a statement (near the end of the line) that, in part, shows:

```
D$ "RUN BERGWALL HELLO"
```

Change this to:

```
D$ "RUN HELLO"
```

Then SAVE Bergwall Hello. Now RENAME Bergwall Hello, Hello. The disk should now boot and run normally.

My copies of Basic Electricity #8010E- copyrighted 1984- booted and ran without any further changes. These all had orange labels. However, a replacement disk from Bergwall with a white label didn't boot and after much head scratching and foot stomping I finally figured out what was wrong.

The copied disk would partially boot and then crash about half way through the Hello program. Listing the Hello file showed some of the program lines were missing but recopying the disk left me with the same problem.

Rereading the section in "Beneath Apple DOS" on how files are stores on a disk, I figured I could follow the Track/Sector list. WRONG!! Did I ever get lost! Fortunately on Copy II+ there is a selection just for people like me. It's called the "DISK MAP". So out of curiosity, desperation, and the lack of any other reasonable ideas I tried it. It showed me that part of the Hello

program was stored on track \$02, sectors \$05 through \$0F! There was the problem! When I used Super IOB and RWTS swap to deprotect the disk, I copied tracks \$03 through \$22, only, and this left some of the file uncopied.

Well I didn't know how to rewrite a complete controller, so I used the swap controller twice. Once to copy track \$02, sector \$05 through \$0F and then again to copy the remaining tracks \$03-\$22, sectors \$00-\$0F.

To do this, change the Newswap.con Controller line 1010 to read:

```
1010 TK=2:LT=3:ST=15:LS=5:CD=WR:FAST=1
```

and line 10010 of Super IOB to match the RWTS.XXX name. Now run Super IOB. Next, reboot Super IOB and copy the remainder of the disk using the previously outlined procedures. This fixed the problem.

Softkey for...

The Right Resume Writer II

Career Development Software, Inc.

This softkey is for program disk version 1.1, copyrighted 1984, and the accompanying tutorial disk, copyrighted 1987.

This program is designed to help high school students develop and produce resumes. It prompts the user to enter typical resume data and then provides a variety of printing formats for the finished product. The users information can also be stored on a disk for future use.

There were several original copies of this program floating around our school, however, many of the instructors were hesitant to lend them for fear of getting back a scrambled disk.

The program is not supplied with backups and is not easily copied by the casual user. Most attempts to copy the disks failed because the data is written on half tracks. This was discovered with my Track Star readout as I investigated how the program loaded. Knowing about the "half track" format, you can make a working nibble copy of the disk. (Use Copy II+ and nibble copy Track \$0 and then Nibble copy Track \$1.5 through \$22.5).

Realizing it is more desirable to have a COPYA-able disk than one that requires a nibble copy program, I thought I'd try to deprotect it. Information from Mr. Jim Hart on RWTS captures and swaps in previous issues of Computist worked well for me in the past so, it seemed the logical place to start. Using the Super IOB and the Newswap.con controller, I was able to produce the cracked disk.

Here is the step by step procedure that produced working copies for me.

1. Boot a DOS 3.3 disk.
2. Initialize two blank disks and delete the HELLO programs. Label one disk "Program" and the other "Tutorial".
INIT HELLO
DELETE HELLO
3. Boot the "Resume Writer" Tutorial disk. When you see the DOS cursor (J), drop into Monitor. I'm lucky here, I'm using a IIgs so "open apple-control-reset" and then "visit monitor" works for me.
4. Once in the monitor, move the Resume Writer RWTS to a safe location.
1900<B800.BFFFM
C600G *boots drive 1, slot 6*
5. Remove the "resume" disk and insert one of the initialized disks.
C600G
6. Insert your disk that contains Super IOB and Newswap.con. Replace the "XXX" in the following with whatever you want to call this special RWTS and save it to the Super IOB disk.
BSAVE RWTS.XXX, A\$1900, L\$800
7. Once the RWTS is saved, load Super IOB and merge the Newswap controller with it.
LOAD SUPER IOB
EXEC NEWSWAP.CON
8. When the cursor returns, modify line 10010 of Super IOB. Replace the ".XXX" in this line with the name you used in step 6 above.
9. Now type RUN and follow the Super IOB instructions.
10. When Super IOB returns the message "COPY DONE", the only thing left to do is make the disk "bootable".
11. Catalog the disk and look for an Applesoft file named "INTRO".
12. RENAME this file "HELLO" and you're all set.

The tutorial disk is now complete. To fix the program disk, just follow steps 3 through 10 above. Then write a short "HELLO" program and save it to the program disk to make it boot as the original did.

1. Get into Applesoft BASIC and clear memory.

NEW

2. Enter this short program:

```
10 HOME: VTAB 12: HTAB 8: PRINT "RIGHT RESUME WRITER II":
```

PRINT CHR\$(4) "BRUN RRWII, A\$0801"

3. Save the new Hello program.
SAVE HELLO

The binary address in the Hello program was found by using Copy II+ and cataloging the newly made program disk. Use "CATALOG DISK W/ FILE LENGTH" if you want to see it for yourself.

At this point I thought I was finished, but when I tried to COPYA my new disk there were a lot of write errors. I'm not sure why. If you have this problem, format a second blank disk and delete the hello program. Now use Copy II+ to "COPY FILES" from the disk you made with Super IOB to this newly formatted disk. Everything should work fine.

Many thanks to Mr. Jim Hart, and Mr. Edward Teach for well written, informative articles. These gentlemen took the time to share their processes and knowledge with the rest of us and for that I am very grateful.

Finally a word to the "MAD GOD", from COMPUTIST #65, about the price of Computist. I think the information available is worth the price especially since I don't have to tear out those &#x\$# cardboard advertisements between every other page! If more people felt as you do, we wouldn't have this great publication. What we *do* need is more subscribers, not necessarily more readers. Quite honestly, I could not believe how *few* Computist subscribers there are! Let's take Mr. Teach's advice and drum up more subscribers.

James E. Bulman

Softkey for...

Magic Spells

The Learning Company

Requirements:

COPYA

A Sector Editor (I used COPY II+ 8.3)

A Blank Disk

Well, my first softkey is really a variation of the softkey submitted by UNK from Erie (COMPUTIST #53). His softkey did not work for my version of Magic Spells. I had given up long ago but Don McClellan's softkey (Issue #63) rekindled my interest in breaking it. Unfortunately, his softkey did not work either but having subscribed to COMPUTIST for over a year I kept on trying. Every copy I attempted would crash after the title screen. By holding down the <OPEN-APPLE> - <CONTROL> - <RESET> keys (and NOT releasing them) I found that the graphics would clear but leave the text so I was able to spot the actual memory location of the crash. I listed the eight bytes before that location. I then used COPY II+ to locate those bytes on disk. I discovered the program had crashed at the spot UNK from Erie had recommended making his sector edits. I saw the hex code (F0) for the BEQ command that he had discussed so I tried a NOP there instead and, BINGO!, a working copy. I had finally completed my first softkey (with special thanks to UNK from Erie). Here is the cookbook method:

1. Boot your DOS 3.3 System Disk
2. Tell DOS to ignore checksums and epilog errors and use COPYA to copy your original disk to a blank disk.
POKE 47246, 24
RUN COPYA
3. Use your sector editor to scan for 98 F0 FE. Mine was on track \$14, sector \$00, byte \$B0.
4. Sector Edit:

Trk	Sct	Byte	From	To
\$14	\$00	\$B0	F0	EA
5. Write the change back to disk.

Ashish Morzaria

This is my first time writing to COMPUTIST, even though I have been a subscriber almost 2 years now. In COMPUTIST #65, I noticed that on the Most Wanted list were Pool of Radiance and Dungeon Masters Assistant Volume I: Encounters (both by SSI). I own both and neither of them is protected. SSI has gone as far as to include a program to copy Pool of Radiance!

My next thought is that this is someone's plea to rid the programs of another type of protection. Both games require you to type in a "code word", from either a manual (DM's Assistant) or a "code wheel" (Pool of Radiance). Sure, it lets owners backup their originals, and foils pirates because they have to copy the manual or code wheel (how would you copy a wheel?). But for starting up the program, it is a hassle.

Softkey for...

Dungeon Master's Assistant

volume I: Encounters

Strategic Simulations Inc.

Avoiding the password

I am fourteen years old, and I don't have much experience with machine language, so if the steps are crude, you know why. Do this on a backup only (as if you didn't know that).

1. Boot the disk, and press Control-Reset after 3 seconds
2. Load the program with the password:
&RECALL "STARTUP",4096
3. Enter the monitor:
CALL -151
4. NOP the subroutine calls:
11E2:EA EA EA EA EA EA EA EA (7 NOPS)
1202:EA EA EA EA EA EA EA EA (5 NOPS)
120E:EA EA EA EA EA EA EA EA (3 NOPS)
1213:EA EA EA EA EA EA EA EA (3 NOPS)
1229:EA EA EA EA EA EA EA EA (2 NOPS)
5. Delete the old file:
& DEL "STARTUP"
6. Save the new file:
& STORE "STARTUP",4096,750
Enjoy!

Softkey for...

Pool Of Radiance

Strategic Simulations, Inc.

Avoiding the password

This is an excellent game. Eight disk sides with more legends and lore than any other game! This is a combo of Ultima and Bard's Tale with a twist. Now a Forgotten Realms Advanced Dungeons & Dragons module, Pool of Radiance has a very appealing feature. It has a command called "quick" which transfers control from you to the computer. The programmers of the game should be praised. When it is 2 AM and your fighting about 79 Kobolds, you really appreciate it. The computer plays your characters intelligently, switching between magic items, to melee weapons, to spells, to missile weapons whenever necessary.

It does have 2 faults. One is the fact that it accesses about 5 sides just to boot. This is okay. It requires you to look on a code wheel. If you mess up, it hangs. The wheel itself uses runes (symbols) instead of letters. It is quite easy to get two runes mixed up. But I am not here to write a review so, again, use backup disks for these:

1. Boot your favorite sector editor. (I used Copy II plus v8.3)
2. Set search for "ZOMBIE". On my disk it was on track \$12, sector \$0A. You will see about 12 code words separated by "00"s.
3. Replace all the code words with the same six letter word (of your choice). Use high bit clear ASCII bytes. (IE. \$41 for "A" instead of \$C1.)
4. Write the sector back.
Now, when you boot Pool Of Radiance, just use your six letter word instead of the code words.
There is probably a way to get rid of the whole routine, but I didn't want to dive into something this big. Just to test it would require more disk switching than I care to do. This way is clean and easy.

(?) Is there a way to enter Low byte letters through the Copy II Plus Text mode?

(?) Can somebody explain how to put on protection? Specifically ProDOS, signature checks, nibbles etc.

Playing Tip for...

Pool Of Radiance

Strategic Simulations, Inc.

•Tired of fights in Koval Mansion and Wealthy? Talk to Orcs, Hobgoblins and Goblins (Parlay) and talk "Haughty". They will tell you something and leave.

•Any sixth level fighters will usually carry a +1 Long Sword (even though it is not apparent).

•When there are magic items, the computer will not tell you. Either use Detect Magic or take them to a weaponist and "ID" them.

•In the wilderness most intelligent, literate creatures, (Lizard Men, Soldiers etc) can be persuaded not to fight if you Parlay "Nice".

•Nomads and Centaurs are Good so Parlay "Nice" and they will talk to you instead of kill you."

•You can go on quests of the council even if you don't have a commission.

•Want somebody besides the council to give you a quest? Go see Diogenes in DragonSpine.

•Need a hideout to rest in the middle of Phlan? Clear Kuto's Well.

•If you come across a well without rungs, don't go down unless you are a thief. (Anybody else becomes toast)

•Journal entry #37 is very helpful. (Most of it is true though I have not found the atlas)

•Doors in Valjevo Castle are booby trapped with an alarm.

•Don't venture into the Castle unless your party can defend against about 10 parties of Fire and Hill Giants.

•Multi-class your characters. (They will reach their full potential before 1/10th of the game is finished. Multi-classed characters take longer to get up).

•The crossed swords in the Temple of Bane are cursed +3's. They cause 5 points of damage to your character just for trying to use them! What alignment do you have to be to use them?

•When Parlaying, use a character with a high Charisma.

•If you have a cursed item which you can't get rid of, get a remove curse cast on him.

These should be enough to keep everybody going. Anybody with this game please write with tips. Looking over my letter, I must have overdone it. I wanted to write a "letter", not a "PhD". I encourage other people to write long letters and pass on tips. That is one of the reasons this magazine is the best!

David Caddell

Softkey for...

Deja Vu Uninvited Shadowgate

Microprose/icom

Requirements:

Apple IIgs
3.5 copy program
Sector editor

Sorry I can't explain this softkey. It was downloaded from Applelink (a great service) and is included in its entirety. Here it is:

You'll need Copy II Plus 8.0 (or greater) to make unprotected backups of ICOM's Deja Vu, Uninvited, and Shadowgate. The following parameters work for all three programs and will make copies that can be installed on a hard disk!

These parameters are only intended to be used for legal BACKUP copies. Remember, software piracy is illegal and WRONG! Well That' all I got so that's all you get. If you want more contact the author on Applelink. In recipe form:

1. Make a fast copy of original using Copy II+ or any other copy program.
2. Make the following sector edits:

Blk	Byte(s)	From	To
\$00D	\$05C	??	80
\$00E	\$15A	??	80
\$023	\$149	??	80
\$024	\$039	??	80
	\$0B4	??	80
	\$190	??	80

The following is my work. If you want more info contact me on Applelink.

A.P.T. for...

Ultima V

Origin Systems

Now in a continuing effort to overkill Ultima V in Computist, here is an A.P.T. (what does that stand for anyway?) for IIgs owners. <text>Warning: I do not know if this effects your status with L.B. when you rest outside. When sector editing the disk it does. I think it checksums the code and I haven't found that.

1. Install the new IIgs CDA's.
2. Boot the Ultima V disk (always do A.P.T.'s to backups).
3. Once you are in the game enter the control panel.
4. Choose Visit Monitor
5. Use the following info to save your character after battle, etc. This will not work in combat situations.
6. After making changes, z-stats to make the computer look at, and acknowledge that they are there. The party info starts at \$1000 and ends at \$12BF.

Parameter	Address	Values assumable
1st char. health	\$1083	\$C7-good
2nd char. health	\$1093	\$C7-good
... and so on		
1st char. hit pts	\$1088-9	\$00 00-99 99
2nd char. hit pts	\$1098-9	\$00 00-99 99

1st char. hit max	\$109A-B	\$00 00-99 99
Food	\$1180-1	\$00 00-99 99
Gold	\$1182-3	\$00 00-99 99
Keys	\$1184	\$00-99
Gems	\$1185	\$00-99
Torches	\$1186	\$00-99
Grapple	\$1187	\$00 or 01-have
Carpet	\$1188	\$00 or 01-have
Skull Keys	\$11F7	\$00-99
Armaments	\$1200-2F	\$00-99
Mixtures	\$1240-6F	\$00-99
Scrolls	\$1270-7	\$00-99
Potions	\$1278-F	\$00-99
Reagents	\$12A0-7	\$00-99

These are what I feel to be the most important locations. There are more things in that area so, happy hunting. The only things that I couldn't find were map locations and character attributes.

{?}A few questions in closing. Can Computist articles be submitted to the editors via E-Mail on any of the major networks? What's happening with the Computist BBS?

Let's take your questions in order. First, A.P.T. stands for Advanced Playing Technique. Just as all the garbage-men became Sanitation Engineers, so cheating on games has become an advanced playing technique. Second, we are not subscribers to any of the commercial BBS's at this time, but we are considering it. And third, we are looking for someone in the Tacoma / Seattle area to be the sysop for the Computist BBS. It requires someone who is retired or who otherwise has a lot of free time. We believe that, once it is up and running, the Computist BBS will become very popular, very fast. And that the sysop will need to spend a lot of time on the board keeping things running smoothly. If you live in the greater Tacoma area and are interested or know someone who might be interested, get in touch with us and let's talk. RDEXed

Dan Reid

Adding track selection to:

Locksmith 6.0 Fastcopy

I liked the article on capturing Locksmith 6.0 Fastcopy. I use it instead of COPYA now because of its speed. But what if you only want to copy one track or maybe just half the disk? Well here is the option that Alpha Logic left out of their Fastcopy, and you can have in yours.

I was getting awfully tired of booting up Locksmith's bit copier or Copy II+ just to copy one track or only part of the disk, so I started looking around inside Fastcopy and found what I needed. Address \$2232 (8754 decimal) holds the start track (normally \$00) and \$2236 (8758) holds the end track (normally \$22). These addresses hold true only if your Fastcopy file loads at \$2000 (8192), if it doesn't then add \$232 and \$236 to the start address of your file to find the proper locations, also check to see that they hold the values \$00 and \$22 to start with. Now by poking my values in those addresses I had a little more control over what was copied. Use the following BASIC program as a loader for your Fastcopy file, it isn't elaborate but does the job.

```
10 TEXT : HOME :N$ = "FASTCOPY" : REM CHANGE
THIS NAME TO YOUR FILENAME
20 VTAB 10: HTAB 10: INPUT "START TRACK (0-34):" : AS:S = VAL (A$) : IF S < 0 OR S > 34 THEN 10
30 VTAB 12: HTAB 10: INPUT "END TRACK (<35):" : AS:E = VAL (A$) : IF E < S OR E > 34 THEN 10
40 PRINT CHR$ (4) "BLOAD" N$
50 POKE 8754,S : POKE 8758,E : CALL 8192: REM CHANGE THESE ADDRESSES IF YOUR COPY DOESN'T LOAD AT $2000
```

Checksums

10-\$F134	30-\$D8DC	50-\$E187
20-\$7B4B	40-\$4ED7	

Marc Batchelor

A General Softkey for Sunburst Software & Mastery Development

Softkey for...

Learning to cope with pressure Counters A wrinkle in time The right job

Survival math skills
Working with decimals
Type to learn
Magic Slate (20 Column)
Magic Slate (40 Column)
Magic Slate (80 Column)

Sunburst Software

Softkey for...

Mastery Arithmetic Games

Mastery Development

Requirements:

A way to reset into the monitor
 Demuffin Plus
 Fast DOS 3.3
 ProDOS 8 v 1.4 or above
 ProDOS IOB 5.25
 COPYA
 Sector Editor

These programs are broken out by the Disk operating system as follows:

DOS 3.3: Learning to cope with pressure
 Counters
 A wrinkle in time
 The right job
 Survival math skills
 Working with decimals
 Mastery Arithmetic Games

ProDOS: Type to learn

SOS: Magic Slate (20 Column)
 Magic Slate (40 Column)
 Magic Slate (80 Column)

Sunburst Software (SS/W) can be broken out into three different categories. We will start with category 1. All of the DOS 3.3 series can be broken the same way. SS/W uses a highly modified RWTS. However, armed with Demuffin Plus, breaking them is a snap.

1. Format as many blank disks as you have originals.
2. Bload Demuffin Plus at \$6000.
3. Boot any one of the DOS 3.3 series listed above and use a NMI card or similar way into the monitor. (I use the Senior Prom).
4. Put Demuffin Plus where it belongs.
803<6000.8103M
5. Start Demuffin Plus
803G
6. Select convert files, and follow the prompts.

While the above steps take care of the DOS 3.3 series, I also had Type to learn. This disk boots up and says ProDOS 1.1.1. I figured that the disk was probably doing some kind of signature check, and that I could just copy the files right off the disk. Wrong. Whoever protected this disk did a heck of a job. When I ran my nibble editor to view the tracks, there were hardly any sync bytes, and the disk was basically scrambled. Thank God for ProDOS IOB 5.25 (and Bill Jetzer). It was as simple as booting the weird disk, using Bills lucid method for capturing the altered device driver and booting a normal ProDOS to save the driver. Then simply load in ProDOS IOB 5.25 and the swap controller and you have it.

1. Format two disks under ProDOS (preferably version 1.4 or 1.7).
2. Boot the Type to learn (TTL) disk and stop execution when you see the BASIC prompt "J" using a NMI card or the like (again, Senior Prom to the rescue).

3. Capture the altered device driver.
300:AD 88 C0 A2 00 BD 00 D0 9D 00 80 E8 D0 F7 EE 0A
310:03 EE 07 03 D0 EF AD 8A C0 60

4. Boot your ProDOS IOB 5.25 disk and save the altered device driver.

PR#6
1900<8000.86FFM
BSAVE DRVR.SUNB,A\$1900,L\$700

5. Load in ProDOS IOB 5.25 and type in (execute in) the swap controller.

6. Make the following modifications to the swap controller:
2010 BK=2:LB=279:CD=WR
10010 ?CHR\$(4)"BLOAD DRVR.SUNB,A\$1900"

7. Run the program.

8. Copy all files off of the copied disk onto a normal formatted ProDOS disk.

The last in the series is different from the others. The Magic Slate series incorporates no format changes for protection. Instead, it uses a signature verification. The signature check was located by searching memory (via Senior Prom) for the message that is printed when a copy of the disk is booted. After finding the routine, I searched memory for the routine that accesses it. Backing up in this manner, I found the protections were all similar and looked like the following:

```
2053 JSR $xxxx
2056 BCS +03
2058 JMP      Message printing routine
205B          — Continue loading
```

Solution to the above is to search for the different bytes and take care of them.

20 and 40 Column Version

1. Copy with COPYA
2. Boot your sector editor. Search for 20 EB 21 90 07 and change 20 EB 21 to 18 90 11. Search for 20 3B 8B 90 03 and change 20 3B 8B to 18 90 03. I found both sector edits to be in track 0 sector 1.

80 Column Version

1. Copy disk with COPYA
2. Boot your sector editor. Search for 20 65 39 90 03 and change 20 65 39 to 18 90 05. Search for 20 C3 3A 90 07 and change 20 C3 3A to 18 90 11. Search for D0 03 4C 41 22 and change 4C 41 22 to EA EA EA.

The benefit of these changes is a faster booting disk. Enjoy, and lock up the originals.

Softkey for...

Super Print

Scholastic Software

Requirements:

COPYA
 ProDOS 8 v1.4 or above
 ProDOS formatted disk
 ProDOS File Copier

Super Print is a Print Shop like program with several advantages. It is more versatile and is quite a good program. Here is the only other company that I have run across that actually modifies ProDOS (an Apple Corp. no-no). To copy it was simple however, just load in COPYA and change the byte at \$B942 to form \$38 to \$18 to ignore certain DOS 3.3 errors and copy the disk. Further, at bootup, there is a signature verification routine. However, copying the files onto a normally formatted ProDOS disk solves that problem nicely without resorting to sector editors to make the changes.

1. Boot a DOS 3.3 disk.
2. Tell DOS to ignore checksum and epilog errors and use COPYA to copy the disk.
POKE 47426,24
RUN COPYA
3. Now boot your ProDOS file copier. Copy all files off of the COPYA disk (except ProDOS) to a ProDOS formatted disk.
4. Now copy ProDOS 8 v1.4 or above to your new disk. It is now totally unlocked.

Jim Ross

Softkey for...

Wizard Of Words

Advanced Ideas

Requirements:

Apple IIgs (ROM 01) or 64K Apple that can reset into Monitor Copy II+
 Super IOB 1.5
 DOS 3.3 System Master
 Wizard of Words original disk
 2 blank 5.25 disks
 Computist #61

A friend asked me to see if I could back-up "Wizard of Words" by Advanced Ideas. I checked the Computist back issue index with no luck. So, this became my first attempt at cracking.

The program is a very nice educational collection of games with words. Six different games are included, with very innovative graphics to keep children interested.

The program boots to a BASIC prompt and then loads to it's

title screen, so I figured I'd try RWTS WORM from Computist #61 and the NEWSWAP controller. It worked and I had a catalogable disk. Copy II+ DISK MAP revealed parts of files on track \$02, so I modified NEWSWAP to copy tracks \$02-\$22.

A little snooping in DOS found "COMEUP.IBC" as the likely HELLO program, so I booted normal DOS and typed "BRUN COMEUP.IBC". This produced a disk drive grind and "I/O ERROR" on the screen. I then looked and found "COMEUP.IBC" loads at \$7900 with a length of \$2100, so it overwrites normal DOS at \$9500. I tried moving it up in memory with no success. Using my IIGs's Visit Monitor desk accessory, I booted the original, and entered the Monitor as soon as the BASIC prompt appeared. I found \$9500 to \$9CF0 all \$00s with a custom compacted DOS from \$9CF0 to \$BFFF. It appears that disk checks (many of them) are intermingled with the DOS as it loads. Various attempts at copies with Copy II+ confirmed this by a screen of garbage before the BASIC prompt, not after, as in most copy protected programs. I moved \$9500 to \$BFFF up to \$2500, booted normal DOS, and saved "WOWDOS" to disk.

On a normal DOS (empty) disk, I used Copy II+ to copy all the files from the disk I made with the NEWSWAP controller. This got the files off of track \$02. I also copied "WOWDOS" to this disk. I booted this disk, BLOADed WOWDOS, moved WOWDOS back to \$9500, and BRUNed COMEUP.IBC and ,VOILA! It worked.

I then wrote a BASIC Hello program to do all this, and was rudely awakened to the fact that when WOWDOS overwrote normal DOS, parts of my Hello program were gone as well. Using the move routine from the softkey for Lode Runner in Computist #22 as a model, I wrote a machine language program to do what my Hello couldn't. I wrote a Hello in BASIC to BLOAD WOWDOS at \$2500, and COMEUP.IBC at \$5000, and then BRUN MOVE which moves WOWDOS to \$9500, COMEUP.IBC to \$7900, and JUMPs to \$7900 to start the program.

1. Follow the instructions in Computist #61 for RWTS WORM to capture the Wizard of Words RWTS.

2. Modify the NEWSWAP controller to copy tracks \$02 to \$22 (using RWTS.WIZARD OF WORDS) onto the first 5.25 disk.

3. INIT the second 5.25" disk using the DOS 3.3 System Master.

4. Use Copy II+ to copy all the files from the first, to the second disk.

5. Enable Visit Monitor on the IIGs.
CALL-151
#

6. Boot Wizard of Words.
6 ctrl-P

7. As soon as the BASIC prompt appears, press Open Apple - ctrl - esc. Select Visit Monitor and press RETURN to enter the Monitor.

8. Move WOWDOS to \$2500 in memory.
2500<9500.BFFFM

9. Boot your second disk with all the copied files on it.

10. When the BASIC prompt appears, save WOWDOS.
BSAVE WOWDOS,A\$2500,L\$2B00

11. Enter the monitor and type in MOVE and save it:
CALL-151

```
1500: A0 25 A9 95 A2 2B 20 15 $9B83
1508: 15 A0 50 A9 79 A2 21 20 $AA2F
1510: 15 15 4C 00 79 84 01 85 $A426
1518: 03 A9 00 85 00 85 02 A0 $0559
1520: 00 B1 00 91 02 C8 D0 F9 $4543
1528: E6 01 E6 03 CA D0 F0 60 $AA2A
BSAVE MOVE,A$1500,L$30
```

12. Return to BASIC.
3DOG

13. Type in HELLO.
10 TEXT:HOME:PRINT CHR\$(4)"BLOAD WOWDOS"
20 PRINT CHR\$(4)"BLOAD COMEUP.IBC,A\$5000"
30 PRINT CHR\$(4)"BRUN MOVE"
SAVE HELLO

14. Copy the backside (Royal Registry of Words) normally.

Michael L. Knickman

I would like you to put the Sirius Software game "Dark Forest" on the Most Wanted List. My original disk does not work with my Apple IIe but works with my brother's Apple II+. I have tried two different disk drives on my system but it still won't completely boot; all I see is the title screen before it crashes. I feel that there may be some sort of nibble count that is interfering with the boot. I have tried to look at the data at the sector level (even looking at half-tracks but my sector editors give I/O errors).

Since the program "runs" on your brothers II+, the most likely explanation is that the program makes calls into the II+ ROM that are changed or not in the same

place on the IIe ROM. The program may also be checking the ROM and thinks that the IIe ROM is a cracking ROM since the two are not the same. In the latter case, it is possible to crack the disk and delete the ROM check routine.RDEXed

Softkey for...

Galactic Attack

Sir-Tech

After being frustrated at trying to deprotect "Dark Forest", I decided to tackle the Sir-Tech game "Galactic Attack". A copied disk will display a message telling you that the disk will not boot and if this is not an original disk then "tough luck, Pirate!". I thought that was very generous of Sir-Tech because it gave me a clue to finding the track and sector of the protection.

Armed with my Computist back issues, I looked up the information on defeating Nibble Counts since that is what I guessed the protection was.

First I scanned the disk (using Copy II+) for all disk access commands. The bytes to search for are BD 8C C0 which are the Hex values for LDA \$C08C,X. I found lots of those bytes, many of which were on the same track & sector so I just started writing down the track, sector and byte of the first ones I found on each track & sector. There were a total of 8 different track/sector locations that contained these bytes, 5 of which were on tracks 0 and 2. I guessed that these were legitimate disk accesses since this is where DOS normally resides. That left three more track/sector locations - track \$13, sector \$3; track \$19, sector \$B; and track \$19, sector \$C. I needed more clues to narrow down the choices but I do not know assembly language - just what I have learned by reading Computist.

Then I searched the disk for the ASCII word "PIRATE" since that was displayed after the nibble count failed. I found it on track \$19, sector \$D so I concentrated on the disk accesses on track \$19, sectors \$B and \$C.

One thing I noticed after booting a copy, was that the disk drive would not stop until after displaying the "Pirate" message. So I scanned the disk for the disk drive motor shutoff command - Hex values BD 88 C0. These were found on track \$13, sector \$2 and track \$19, sector \$C. Hmm, track \$19 again; I must be getting closer.

I tried disassembling track \$19 sector \$C (starting at the first byte in the disk access command "BD"), but didn't see anything that looked like a nibble count so I disassembled sector \$B working backwards from the point of failure. As I said, assembly language knowledge is very limited but I did notice some compares (CMP) on this sector. These compares occurred after reading a byte off the disk and most of them compared against values that I knew to be DOS reserved bytes such as D5, AA, and 96. However, one CMP compared against the value \$36 which, to me, was kind of fishy, especially since it was the last CMP statement on that sector.

Here is the disassembly for track \$19, sector \$B (partial):

86-	C9 36	CMP	#\$36	compare disk value with \$36
88-	60	RTS		if good, return from subroutine
89-	38	SEC		if not then set carry flag and
8A-	60	RTS		return from subroutine
8B-	00	BRK		garbage

Not wanting to search for the nibble count routine which called this subroutine, I decided to try the easy way out. Since the program sets the carry if the byte read from disk is not what is expected, why not just replace that command with a Clear Carry command (CLC) so that, no matter what byte is read, the carry flag will always be clear? So I edited track \$19, sector \$B, byte \$89 from \$38 to \$18 (CLC) and wrote the sector back to disk on my copy. Success!!!

All this explanation was just to help other poor users out there like myself who, even after reading Computist for so long, haven't been able to figure out how to deprotect a program yet.

1. Boot your DOS 3.3 system disk.

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

POKE 47426,24
RUN COPYA

3. Sector edit the copy.

Trk	Sct	Byte	From	To
\$19	\$0B	\$89	38	18

Stan T. Merka

Putting Mean 18 (Iigs) on a Hard drive

Mean 18 is an excellent golf game for the Apple Iigs that has only one drawback. The way it comes off the shelf, you cannot use it from a hard disk, since it has hard-coded pathname references to the original disk. The main advantage of using a hard drive is that the game runs much faster. I decided to see if the pathname references could be changed so that the game would run from a

hard disk. The game is also copy protected but the patch that deprotects it appeared in COMPUTIST #48. For those of you who do not have this issue, the patch is as follows:

Blk	Byte(s)	From	To
\$506	\$174	8D	AD
\$29C	\$174	8D	AD

At this point you have a deprotected copy of Mean 18, but still cannot use it from a hard disk.

By using the search function of Copy II+, you can look at all the references to the prefix /Mean18/, and by changing these, you can then use it from any disk that you specify. The problem is, that if you hard-code a new path, you will only be able to use it from that drive and directory and nowhere else.

GS/OS and ProDOS 16 have a convention, where "1/" can be used as the prefix for the application subdirectory. Thus if you change all pathnames from /Mean18/ to 1/ on a copy of your Mean 18 disk (you should never do any changes to the original disk), the game will run from any subdirectory of any disk it is on.

One more thing has to be considered before you plunge into changing all the pathnames. Some have a length byte preceding them, and these length bytes have to be changed to the proper number corresponding to the new length of the entire pathname. When a length byte does not precede the pathname, a null character (\$00) must follow the pathname. Since the new pathname is shorter than before, replace the remaining letters and slashes of the old pathname by null characters (\$00) (switching over to Hex edit mode). This is indicated in the table below as "00.."

As far as the particulars of changing these pathnames, you can use Copy II+ or Block Warden or any other sector editor that will allow you to change Hex as well as Text characters in each block (see the instruction manual for your particular editor).

The following addresses in my version of Mean 18 needed changes in order to make this game compatible with a Hard Disk. If these do not correspond in your version, use the "search" function of your editor to find the proper addresses of these pathnames.

Block \$340

Byte	From	To	
\$0CE	10	0A	(length byte)
\$0CF-	/Mean18/meandat/	1/meandat/	
\$0D9-	??...	00...	
\$135	08	02	
\$136-	/Mean18/	1/	
\$138-	??...	00...	
\$199	12	0C	
\$19A-	/Mean18/golf.sys16	1/golf.sys16	
\$1A6-	??...	00...	

Block \$5B5

\$113	0C	06	
\$114-	/Mean18/arch	1/arch	
\$11A-	??...	00...	
\$149	10	0A	
\$14A-	/Mean18/meandat/	1/meandat/	
\$153-	??...	00...	
\$15B-	/Mean18/	1/	
\$15D-	??...	00...	
\$164-	/Mean18/meandat/golf.dat	1/meandat/golf.dat	
\$176-	??...	00...	
\$1B5	08	02	
\$1B6-	/Mean18/	1/	
\$1B8-	??...	00...	

Block \$5C0

\$0C1-	/Mean18/meandat/LOGO	1/meandat/LOGO	
\$0CF-	??...	00...	
\$0EA-	/Mean18/meandat/TITLE.GSH	1/meandat/TITLE.GSH	
\$0FD-	??...	00...	
\$155	0C	06	
\$156-	/Mean18/arch	1/arch	
\$15C-	??...	00...	
\$163-	/Mean18/meandat/gopher.gsh	1/meandat/gopher.gsh	
\$177-	??...	00...	
\$180-	/Mean18/meandat/golfer.gsh	1/meandat/golfer.gsh	
\$194-	??...	00...	
\$19D-	/Mean18/meandat/putter.gsh	1/meandat/putter.gsh	
\$1B1-	??...	00...	
\$1BA-	/Mean18/meandat/OPTION.GSH	1/meandat/OPTION.GSH	
\$1CE-	??...	00...	

Block \$5C1

\$0FB-	/Mean18/meandat/golfgadg	1/meandat/golfgadg	
\$10D-	??...	00...	

Block \$5C8

\$125-	/Mean18/meandat/accolade.snc	1/meandat/accolade.snc	
\$13B-	??...	00...	
\$142-	/Mean18/meandat/badbeep.snd	1/meandat/badbeep.snd	
\$157-	??...	00...	
\$15E-	/Mean18/meandat/bark1.snd	1/meandat/bark1.snd	
\$171-	??...	00...	
\$178-	/Mean18/meandat/chip1.snd	1/meandat/chip1.snd	
\$18B-	00..		
\$192-	/Mean18/meandat/crowd1.snd	1/meandat/crowd1.snd	
\$1A6-	??...	00...	
\$1AD-	/Mean18/meandat/cup1.snc	1/meandat/cup1.snc	
\$1BF-	??...	00...	
\$1C6-	/Mean18/meandat/glass1.snd	1/meandat/glass1.snd	
\$1DA-	??...	00...	
\$1E1-	/Mean18/meandat/goodbeep.snd	1/meandat/goodbeep.snd	
\$1F7-	??...	00...	
\$1FE-	/M	1/	

Note: This pathname continues into the next block.

Block \$5C9

\$000-	ean18/meandat/putt1.snc	meandat/putt1.snc	
\$011-	??...	00...	
\$018-	/Mean18/meandat/rick1.snc	1/meandat/rick1.snc	
\$02B-	??...	00...	
\$032-	/Mean18/meandat/rick2.snd	1/meandat/rick2.snd	
\$045-	??...	00...	
\$04C-	/Mean18/meandat/sigh1.snc	1/meandat/sigh1.snc	
\$05F-	??...	00...	
\$066-	/Mean18/meandat/wack1.snd	1/meandat/wack1.snd	
\$079-	??...	00...	
\$080-	/Mean18/meandat/water1.snc	1/meandat/water1.snc	
\$094-	??...	00...	

This is a somewhat tedious undertaking, but if you are careful about typing mistakes, the result is a game that can be used from a hard disk. Copy all the files from the Mean 18 disk to your Hard Drive except for ProDOS and System subdirectory. They can go into any subdirectory on your drive, but the subdirectory "meandat" must remain a sub-subdirectory of your subdirectory. Note also, that the different course files have to be in the root directory in order for the game to find them. Enjoy.

Jack R. Nissel

Softkey for...

Reader Rabbit

The Learning Company

Requirements:

The original Reader Rabbit disk

1 blank disk

COPYA

Copy II Plus

Any disk with normal DOS 3.3

1. Boot your DOS 3.3 system master and at the "J" prompt enter:
POKE 47426,24 ignore checksums and epilogues
RUN COPYA

2. Copy your original disk to your blank disk.

3. Use the COPY DOS function from Copy II Plus to copy normal DOS 3.3 from any disk that has it to your copy.

4. Use the Change Boot Program function from Copy II Plus to check to make sure that the Boot Program name is HELLO. If it is not, use this function to change it to HELLO.

Softkey for...

Kindercomp

Spinnaker Software

Requirements:

Original Kindercomp disk

A blank disk

Demuffin Plus

DOS 3.3 system master

A way to reset into the monitor

To deprotect this title we will use the RWTS of the protected

disk, with Demuffin Plus, to copy the files from the original disk and then write them back to your blank disk.

1. Boot a DOS 3.3 disk. Initialize a slave disk with the hello name "MENU" and delete "MENU".

INIT MENU
DELETE MENU

2. Boot your original disk and reset into the monitor after the first 3 tracks are read.

3. Move the RWTS to a safe place, so it won't be destroyed when you boot your slave disk, by entering:

6800<B800.BFFFM

4. Boot your slave disk.
C600G

5. Put in your Demuffin Plus disk and enter:

CALL-151 (gets you into the monitor)

BLOAD DEMUFFIN PLUS,A\$803

FF59G (if you hear a beep ignore it)

B800<6800.6FFFM (moves the protected RWTS back to its original location)

A851G (reconnects DOS)

803G (starts Demuffin Plus)

5. Put your original disk in and copy all of the files to your blank initialized disk. When asked to put in a file name enter "=" and when asked if you want prompting answer "N".

Softkey for...

Steps to Comprehension

Educational Publishing Concepts

Requirements:

The original Steps To Comprehension disks

8 blank disks

DOS 3.3 system master

A sector editor

1. Boot your DOS 3.3 system master and at the] prompt enter:
POKE 47426,24 (ignore checksums and epilogues)
RUN COPYA

2. Copy all 8 sides of your original to your blank disks.

3. Make the following sector edit to your master disk.

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

4. Write the sector back to the disk.

Softkey for...

Hobbit

Media Basics Courseware

The modified Super IOB and the controller for Blue Powder Grey Smoke from Bill Jetzer in issue 53 worked for this title. Note that this is not the same Hobbit put out by Addison-Wesley.

Requirements:

The original Hobbit disk

A blank disk

Super IOB v1.5

If you haven't modified Super IOB yet do the following first: Boot your Super IOB disk; after it loads press control-reset. At the Applesoft prompt enter:

LOAD SUPER IOB (or load whatever the correct filename is on your disk).

630 REM R/W EVERY OTHER TRACK

640 POKE 904,32:POKE 905,168:POKE 906,3:POKE 936,238:POKE 937,14:POKE 938,3:POKE 939,238:POKE 940,14:POKE 941,3 POKE 942,96:RETURN

650 REM R/W EVERY TRACK

660 POKE 904,238:POKE 905,14:POKE 906,3:RETURN

SAVE SUPER IOB (or the correct filename if different).

1. Load the controller listed below into Super IOB and copy your original disk to your blank.

Controller

1000 REM MEDIA BASICS 'HOBBIT'

1010 ST = 15:LS = 15:CD = WR:FAST = 1: GOSUB 640

1020 TK = 0:LT = 36: GOSUB 1050

1030 TK = 1:LT = 35: GOSUB 1050

1040 HOME : PRINT "COPYDONE" : END

1050 POKE 47426,24: IF TK / 2 > INT (TK / 2) THEN POKE 47445,212

1060 GOSUB 490: GOSUB 610

1070 GOSUB 230: GOSUB 490: GOSUB 610: IF PEEK (TRK) = LT THEN RETURN

1080 TK = PEEK (TRK):ST = PEEK (SCT): GOTO 1050

Checksums

1000-\$356B 1030-\$0C52 1060-\$FF6C

1010-\$0A5A 1040-\$E9AB 1070-\$1C66
1020-\$CF7E 1050-\$7316 1080-\$2AF3

Softkey for...

Writing Adventure

DLM Software

Requirements:

The original Writing Adventure disks

2 blank disks

A sector editor

A way to reset into the monitor

FID from your DOS 3.3 system master

To deprotect this title we will use the RWTS of the protected disk, with FID to copy the files from the original disk then write them back to your blank disk.

1. Boot your DOS 3.3 system disk and at the Applesoft prompt initialize both of your blank disks by entering:

INIT HELLO

DELETE HELLO

2. Boot the Story Writer disk and reset into the monitor after the Applesoft prompt appears.

3. Move the RWTS to a safe place, so it won't be destroyed when you boot your slave disk, by entering:

6800<B800.BFFFM

4. Boot your slave disk
C600G

5. Put in your FID disk and enter

CALL-151 (gets you into the monitor)

BLOAD FID,A\$803

FF59G (if you hear a beep ignore it)

B800<6800.6FFFM (moves the protected RWTS back to its original location)

A851G (reconnects DOS)

803G (starts FID)

5. Put your original disk in and copy all of the files to your blank initialized disk. When asked to put in a file name enter = and when asked if you want prompting answer N.

6. Boot your sector editor and read track 00, sector 00 from your original Story Starter disk and write it back to your copy of the Story Starter disk.

7. Repeat step 5 for your second original disk.

Softkey for...

Stickybear Music

Optimum Resource

Requirements:

The original disk

A blank disk

DOS 3.3 system master

Any sector editor

1. Boot your DOS 3.3 system master and at the] prompt enter:
POKE 47426,24 (ignore checksum and epilogues)
RUN COPYA

2. Copy your original to your blank disk.

3. Make the following sector edit:

Trk	Sct	Byte	From	To
02	06	00	A9	60

4. Write the sector back to the disk.

Softkey for...

Show Time

Quick Flash

Clock Works

Phonics Prime Time: Final Consonants

Phonics Prime Time: Initial Consonants

Words at Work: Prefix Power

Words at Work: Contraction Action

Speedway Math

MECC

Requirements:

The original MECC disks

A blank disk for each title

Super IOB v1.5

A sector editor

Jim Hart's Super IOB controller in COMPUTIST #48 for New Oregon Trail deprotected these MECC titles. Here it is in case you don't have that issue:

1. Install the controller shown below into Super IOB and copy

your original disk(s) to your blank.

2. Make the following sector edits to your copy:

Trk	Sct	Byte	From	To
00	06	86	96	AA
00	06	8B	AA	AD
00	07	1F	96	AA
00	07	2A	AA	AD
00	07	83	AA	D5
00	07	8D	D5	AA
00	07	98	AD	96

3. Write each sector back to the disk before going to the next sector.

Controller

1000 REM MECC SOFTWARE

1010 TK = 0:LT = 1:ST = 15:LS = 15:CD = WR:FAST = 1

1020 GOSUB 490: GOSUB 610

1030 GOSUB 490: GOSUB 610: IF PEEK (TRK) = LT THEN 1050

1040 TK = PEEK (TRK):ST = PEEK (SCT): GOTO 1020

1050 TK = 1:LT = 35:ST = 15:LS = 15:CD = WR:FAST = 1

1060 RESTORE : GOSUB 190: GOSUB 210

1065 GOSUB 490: GOSUB 610

1070 GOSUB 230: GOSUB 490: GOSUB 610

1075 IF PEEK (TRK) = LT THEN 1090

1080 TK = PEEK (TRK):ST = PEEK (SCT): GOTO 1060

1090 HOME : PRINT "DONE WITH COPY" : END

5000 DATA 170,213,173,213,150,170

Checksums

1000-\$356B 1050-\$5B67 1080-\$1AAA

1010-\$EA41 1060-\$A3CE 1090-\$6DF3

1020-\$3164 1065-\$6210 5000-\$BB62

1030-\$5E3F 1070-\$E051

1040-\$3A08 1075-\$002D

Softkey for...

Stickybear Opposites

Optimum Resource

Requirements:

The original Stickybear Opposites disk

A blank disk

DOS 3.3 system master

Any sector editor

1. Boot your DOS 3.3 system master and at the] prompt enter:
POKE 47426,24 (ignore checksum and epilogues)
RUN COPYA

2. Copy your original to your blank disk.

3. Make the following sector edits:

Trk	Sct	Byte	From	To
02	06	00	A9	60
02	07	00	94	1F

4. Write each sector back to the disk before going to the next sector.

Softkey for...

Manager Backup Diskette

Milliken Publishing

Requirements:

The original Management Backup Diskette disk

A blank disk

DOS 3.3 system master

A sector editor

1. Boot your DOS 3.3 system disk and at the] prompt enter:
POKE 47426,24 (ignore checksums and epilogues)
RUN COPYA

2. Copy your original disk to your blank.

3. Make the following sector edits to your copy. This gives you a normal catalog track.

Trk	Sct	Byte	From	To
11	00	00-01	A0 F1	04 11

Softkey for...

Number Munchers

MECC

Jim Hart's Super IOB controller in issue 48 for New Oregon Trail also deprotected this MECC title, however the bytes to be edited were not in the same locations. I was able to find the correct

locations by looking at the locations to be edited on New Oregon Trail and scanning with a sector editor for the same byte strings on Number Munchers. This is why it is so important to give the "from" bytes, otherwise there is no way of knowing if the bytes are the correct ones to change.

Requirements:

The original disk
A blank disk
Super IOB v1.5
A sector editor

1. Install the controller shown below into Super IOB and copy your original disk(s) to your blank.

2. Make the following sector edits to your copy:

Trk	Sct	Byte	From	To
00	0A	E8	AA	D5
00	0A	F2	D5	AA
00	0A	FD	AD	96
00	0B	79	96	AA
00	0B	83	AA	AD
00	0C	62	96	AA
00	0C	67	AA	AD

3. Write each sector back to the disk before going to the next sector.

Controller

```
1000 REM NUMBER MUNCHERS
1010 TK = 0:LT = 1:ST = 15:LS = 15:CD =
WR:FAST = 1
1020 GOSUB 490: GOSUB 610
1030 GOSUB 490: GOSUB 610: IF PEEK (TRK) = LT
THEN 1050
1040 TK = PEEK (TRK):ST = PEEK (SCT): GOTO
1020
1050 TK = 1:LT = 35:ST = 15:LS = 15:CD =
WR:FAST = 1
1060 RESTORE : GOSUB 190: GOSUB 210
1065 GOSUB 490: GOSUB 610
1070 GOSUB 230: GOSUB 490: GOSUB 610
1075 IF PEEK (TRK) = LT THEN 1090
1080 TK = PEEK (TRK):ST = PEEK (SCT): GOTO
1060
1090 HOME : PRINT "DONE WITH COPY" : END
5000 DATA 170,213,173,213,150,170
```

Checksums

1000-\$356B	1050-\$5B67	1080-\$1AAA
1010-\$EA41	1060-\$A3CE	1090-\$6DF3
1020-\$3164	1065-\$6210	5000-\$BB62
1030-\$5E3F	1070-\$E051	
1040-\$3A08	1075-\$002D	

Softkey for...

Spy's Adventures in North America

Polarware

Requirements:

The original disk
2 blank sides
Any fast copy program
A sector editor that has a scan for bytes feature

This is another in the Spy's Adventure series and it is just as good as the other releases. This series, like the Where is Carmen Sandiego series, teaches you about different parts of the world.

My original disk was COPYA-able but naturally the copy would not work. The softkeys for the other Spy's Adventure titles showed that they were not COPYA-able without some modification and they would not work on my copy. If your original can be fast copied this may work for you.

1. Fast copy both sides of your original to your blank disks.
2. Use your sector editor to scan the boot side of your copy for A2 03 B5 00 and change it to A9 56 60 FB.
3. Write the sector back to the disk.

Softkey for...

Children's Writing and Publishing Center

The Learning Company

Requirements:

The original disks
5 blank sides
COPYA from your DOS 3.3 system master
Any fast copy program

1. Boot your DOS 3.3 system master and at the Applesoft prompt enter:
POKE 47426,24
RUN COPYA

2. Copy side 1 of your program disk to a blank disk.
3. Use any fast copy program to copy the remaining sides to the rest of your blank disks.
That's it.

Softkey for...

**Una Vista a Mexico
Un Dia Tipico
El Mundo Hispanico
Elementary Math**

D.C.Heath

Requirements:

The original disk
3 blank sides for each title
A sector editor
Any fast copy program that can ignore errors

The softkey for D.C. Heath Elementary Math by Jim Bancroft in COMPUTIST 62 was great except for one thing. My D.C. Heath titles did not have enough room on the disk for the additional files needed. The problems Mr. Bancroft had were similar to mine, such as the SAVE command not working and the disk being catalogable but loading as garbage, so this softkey may also work for Elementary Math.

1. Fast copy the original disks to your blank disks and ignore a read error on track 03 of disk 1 if you get one.
2. Make the following sector edits to each disk. You may have to scan for these bytes on Elementary Math.

Trk	Sct	Byte	From	To
00	05	69-6B	E4 73 7B	15 2F 00

4. Write each sector back to the disk before going on to the next sector.

Softkey for...

**Dr. Jessie's Dinosaur
The Otters' Adventure**

Grolier Software

Requirements:

The original disk
A blank disk for each title
A sector editor
Any fast copy program that can ignore errors

1. Fast copy the original disks to your blank disks and ignore a read error on track 03.
2. Make the following sector edit to your copy:

Trk	Sct	Byte	From	To
00	05	69-6B	E4 73 7B	15 6C 0C

4. Write this sector back to the disk.

Softkey for...

Shanghai (GS)

Activision

Requirements:

The original disk
A blank disk
A 3.5 sector editor
Any fast copy program

None of the softkeys in COMPUTIST for this title worked. One however had the byte string to change on a different block than on my disk.

1. Fast copy your original disk to your blank disk.
2. Make the following sector edits to your copy.

Blk	Byte	From	To
\$027C	168-16B	18 FB C2 30	A9 01 00 63

3. Write the block back to the disk.

Softkey for...

Magic Castle Red Level

Learning Well

Requirements:

The original disk
A blank disk
DOS 3.3 system master
A way to reset into the monitor
Super IOB v1.5

1. Boot your DOS 3.3 system disk and at the Applesoft prompt put in a blank disk and enter:
CALL-151
9E42:14
(gets you into the monitor)
(changes RUN command to EXEC)

INIT START *(initializes a disk to look for a file called START and puts a file on the disk called start)*
DELETE START *(deletes the file called START)*

2. Boot your original disk and reset into the monitor after the first 3 tracks are read.
3. Move the RWTS to a safe place, so it won't be destroyed when you boot your slave disk, by entering:
1900<B800.BFFF
4. Boot your slave disk:
C600G
4. After the disk boots and the Applesoft prompt appears insert your Super IOB disk and save the RWTS to it by entering:
BSAVE RWTS.MAGIC CASTLE RED LEVEL, A\$1900, L\$800
5. Install the Controller:

Controller

```
1000 REM MAGIC CASTLE RED LEVEL
1010 TK = 3:ST = 0:LT = 35:CD = WR
1020 T1 = TK: GOSUB 490: GOSUB 360: ONERR
GOTO 550
1030 GOSUB 430: GOSUB 100:ST = ST + 1: IF ST
< DOS THEN 1030
1040 IF BF THEN 1060
1050 ST = 0:TK = TK + 1: IF TK < LT THEN 1030
1060 GOSUB 490:TK = T1:ST = 0: GOSUB 360
1070 GOSUB 430: GOSUB 100:ST = ST + 1: IF ST
< DOS THEN 1070
1080 ST = 0:TK = TK + 1: IF BF = 0 AND TK <
LT THEN 1070
1090 IF TK < LT THEN 1020
1100 HOME : PRINT "YOUR COPY IS FINISHED" :
END
10010 IF PEEK (6400) < > 162 THEN PRINT CHR$
(4) "LOAD RWTS.MAGIC CASTLE RED LEVEL,
A$1900"
```

Checksums

1000-\$356B	1040-\$6342	1080-\$6CA2
1010-\$3565	1050-\$ABA3	1090-\$9DCA
1020-\$6170	1060-\$20C0	1100-\$42BE
1030-\$7771	1070-\$28C5	10010-\$EEA0

Softkey for...

**Wordfun Snake-o-nyms
Word Flip**

Milliken

Requirements:

The original disk
A blank disk
COPYA from your DOS 3.3 system master
Copy II Plus

1. Boot your DOS 3.3 system master and at the Applesoft prompt enter:
POKE 47426,24
RUN COPYA

2. Copy your original to your blank disk.

3. Make the following sector edits:

Trk	Sct	Byte	From	To
00	03	42	38	18
11	00	01	F1	11

4. Write each sector back to the disk before going to the next sector.
5. This program would not boot on my GS while I was in the fast mode. Replacing the DOS solved the problem.

Softkey for...

**Wally's Word Works:
Teacher and Student Elementary**

Sunburst Communications

Requirements:

The original disks
2 blank disks
A blank INITIALIZED slave disk
A way to reset into the monitor
Super IOB v1.5
DOS 3.3 system disk

1. Boot your DOS 3.3 system disk and at the Applesoft prompt put in a blank disk and enter:
INIT HELLO
DELETE HELLO
2. Boot your original disk 1 and at the Applesoft prompt reset into the monitor.
3. Move the RWTS to a safe place, where it won't be destroyed

when you boot your slave disk, by entering:
1900<B800.BFFFFM

4. Put in your slave disk and boot it by entering:
C600G

5. After the disk boots and the Applesoft prompt appears insert your Super IOB disk and save the RWTS to it by entering:
BSAVE RWTS.WALLY'S WORD WORKS,AS1900,LS800

6. Install the controller into Super IOB, run it and copy your original disk 1 to the blank disk that you initialized HELLO. Answer NO when asked if you want to INITIALize the blank disk.

Controller

```
1000 REM WALLY'S WORD WORKS
1010 TK = 3:ST = 0:LT = 35:CD = WR
1020 T1 = TK: GOSUB 490: GOSUB 360: ONERR
      GOTO 550
1030 GOSUB 430: GOSUB 100:ST = ST + 1: IF ST
      < DOS THEN 1030
1040 IF BF THEN 1060
1050 ST = 0:TK = TK + 1: IF TK < LT THEN 1030
1060 GOSUB 490:TK = T1:ST = 0: GOSUB 360
1070 GOSUB 430: GOSUB 100:ST = ST + 1: IF ST
      < DOS THEN 1070
1080 ST = 0:TK = TK + 1: IF BF = 0 AND TK <
      LT THEN 1070
1090 IF TK < LT THEN 1020
1100 HOME : PRINT
      "THIS SIDE OF WALLY IS COMPLETE" : END
10010 IF PEEK (6400) < > 162 THEN PRINT CHR$
      (4) "BLOAD RWTS.WALLY'S WORD WORKS,AS1900"
```

Checksums

1000-\$356B	1040-\$6342	1080-\$6CA2
1010-\$3565	1050-\$ABA3	1090-\$9DCB
1020-\$6170	1060-\$20C0	1100-\$1B8F
1030-\$7771	1070-\$28C5	10010-\$3844

7. When side one is done and you have the Applesoft prompt enter the following:

1010 TK=0:LT=35:CD=WR
RUN

8. Put in disk 2 and follow the prompts to copy the second disk to your blank. Answer YES when asked if you want to INITIALize the blank disk.

Softkey for...

Counting Critters

MECC

Requirements:

The original disk
 A blank initialized disk
 Super IOB v1.5

1. INITIALize your blank disk
INIT HELLO
DELETE HELLO

2. Install the controller listed below into Super IOB, run it and copy your original disk to your blank disk. Answer NO when asked if you want to INITIALize the blank disk.

Controller

```
1000 REM COUNTING CRITTERS
1010 TK = 3:LT = 35:ST = 15:LS = 15:CD =
      WR:FAST = 1
1020 RESTORE : GOSUB 190: GOSUB 210
1025 GOSUB 490: GOSUB 610
1030 GOSUB 230: GOSUB 490: GOSUB 610
1035 IF PEEK (TRK) = LT THEN 1050
1040 TK = PEEK (TRK):ST = PEEK (SCT): GOTO
      1020
1050 HOME : PRINT "COPY DONE" : END
5000 DATA 170,213,173,213,150,170
```

Checksums

1000-\$356B	1025-\$F0C7	1040-\$F69F
1010-\$2445	1030-\$6686	1050-\$7098
1020-\$288C	1035-\$FDBB	5000-\$246D

I want to thank Stephen Lau for sending me the following softkeys to help me in deprotecting some of my disks:

Softkey for...

Voyage of the Mimi: Maps and Navigation

Requirements:

The original disks
 3 blank disks
 A blank initialized slave disk

Super IOB v1.5

A way to reset into the monitor
 Copy II Plus
 Any standard DOS 3.3 disk (not fast DOS)

This title can be deprotected by using Super IOB with the Swap Controller and use the RWTS of the protected disk to read the original disk, then using a normal RWTS to write the information back to your blank disk.

1. Boot your original disk and at the Applesoft prompt reset into the monitor.

2. Move the RWTS to a safe place, where it won't be destroyed when you boot your slave disk, by entering:

1900<B800.BFFFFM

3. Put in your slave disk and boot it by entering:

C600G

4. After the disk boots and the Applesoft prompt appears insert your Super IOB disk and save the RWTS to it by entering:
BSAVE RWTS.MIMI MAPS AND NAVIGATION,AS1900,LS800

5. Install the controller into Super IOB, run it and copy your original disk to your blank disk. Answer YES when asked if you want to INITIALize the blank disk.

Controller

```
1000 REM MIMI MAPS AND NAVIGATION
1010 TK = 1:ST = 0:LT = 35:CD = WR
1020 T1 = TK: GOSUB 490: GOSUB 360: ONERR
      GOTO 550
1030 GOSUB 430: GOSUB 100:ST = ST + 1: IF ST
      < DOS THEN 1030
1040 IF BF THEN 1060
1050 ST = 0:TK = TK + 1: IF TK < LT THEN 1030
1060 GOSUB 490:TK = T1:ST = 0: GOSUB 360
1070 GOSUB 430: GOSUB 100:ST = ST + 1: IF ST
      < DOS THEN 1070
1080 ST = 0:TK = TK + 1: IF BF = 0 AND TK <
      LT THEN 1070
1090 IF TK < LT THEN 1020
1100 HOME : PRINT "YOU NOW HAVE ANOTHER
      DEPROTECTED DISK" : END
10010 IF PEEK (6400) < > 162 THEN PRINT CHR$
      (4) "BLOAD RWTS.MIMI MAPS AND NAVIGATION,
      AS1900"
```

Checksums

1000-\$356B	1040-\$6B47	1080-\$69A0
1010-\$3067	1050-\$A9A6	1090-\$9DCB
1020-\$4321	1060-\$28C5	1100-\$C676
1030-\$5520	1070-\$20C0	10010-\$2E63

6. Boot your Copy II Plus bit copy utilities and sector copy track \$00 from any standard DOS 3.3 disk to track \$00 of your copy (all 3 disks).

Softkey for...

First Verbs

Laureate Learning Systems

Requirements:

The original disk
 A blank disk
 A blank initialized slave disk
 Super IOB v1.5
 A way to reset into the monitor
 Copy II Plus

This title can be deprotected by using Super IOB with the Swap Controller. Use the RWTS of the protected disk to read the original disk; then use a normal RWTS to write the information back to your blank disk.

1. Boot your original disk and at the Applesoft prompt reset into the monitor.

2. Move the RWTS to a safe place, where it won't be destroyed when you boot your slave disk, by entering:

1900<B800.BFFFFM

3. Put in your slave disk and boot it by entering:
C600G

4. After the disk boots and the Applesoft prompt appears insert your Super IOB disk and save the RWTS to it by entering:
BSAVE RWTS.FIRST VERBS,AS1900,LS800

5. Install the controller into Super IOB, run it and copy your original disk to your blank disk. Answer YES when asked if you want to INITIALize the blank disk.

Controller

```
1000 REM FIRST VERBS
1010 TK = 1:ST = 0:LT = 35:CD = WR
1020 T1 = TK: GOSUB 490: GOSUB 360: ONERR
```

GOTO 550

```
1030 GOSUB 430: GOSUB 100:ST = ST + 1: IF ST
      < DOS THEN 1030
1040 IF BF THEN 1060
1050 ST = 0:TK = TK + 1: IF TK < LT THEN 1030
1060 GOSUB 490:TK = T1:ST = 0: GOSUB 360
1070 GOSUB 430: GOSUB 100:ST = ST + 1: IF ST
      < DOS THEN 1070
1080 ST = 0:TK = TK + 1: IF BF = 0 AND TK <
      LT THEN 1070
1090 IF TK < LT THEN 1020
1100 HOME : PRINT "THAT'S ALL FOLKS" : END
10010 IF PEEK (6400) < > 162 THEN PRINT CHR$
      (4) "BLOAD RWTS.FIRST VERBS,AS1900"
```

Checksums

1000-\$356B	1040-\$6B47	1080-\$69A0
1010-\$3067	1050-\$A9A6	1090-\$9DCB
1020-\$4321	1060-\$28C5	1100-\$A0A0
1030-\$5520	1070-\$20C0	10010-\$7756

6. Boot your Copy II Plus bit copy utilities and sector copy track \$00 from your protected disk to track \$00 of your copy; ignore the error.

7. Make the following edits:

Trk	Sct	Byte	From	To
00	01	3C	1D	00
		EB	1D	00
	02	E7	FE	D5
		F1	CA	AA
	03	35	FE	DE
		3F	FE	AA
		55	A5	D5
		5F	CA	AA
		91	FE	DE
		9B	FE	AA
	04	D5-D6	20 D6	D5 20

Write each sector back to the disk before going to the next sector.

Softkey for...

Wizard of Words

Computer Advance Ideas

Requirements:

The original disk
 2 blank disks
 A blank initialized slave disk
 Super IOB v1.5
 A way to reset into the monitor
 Copy II Plus

This title can be deprotected by using Super IOB with the Swap Controller. Use the RWTS of the protected disk to read the original disk; then use a normal RWTS to write the information back to your blank disk.

1. Boot your original disk and at the Applesoft prompt reset into the monitor.

2. Move the RWTS to a safe place, where it won't be destroyed when you boot your slave disk, by entering:

1900<B800.BFFFFM

3. Put in your slave disk and boot it by entering:
C600G

4. After the disk boots and the Applesoft prompt appears insert your Super IOB disk and save the RWTS to it by entering:
BSAVE RWTS.WIZARD OF WORDS,AS1900,LS800

5. Install the controller into Super IOB, run it and copy both sides of your original disk to your blank disks. Answer YES when asked if you want to INITIALize the blank disks.

Controller

```
1000 REM WIZARD OF WORDS
1010 TK = 0:ST = 0:LT = 35:CD = WR
1020 T1 = TK: GOSUB 490: GOSUB 360: ONERR
      GOTO 550
1030 GOSUB 430: GOSUB 100:ST = ST + 1: IF ST
      < DOS THEN 1030
1040 IF BF THEN 1060
1050 ST = 0:TK = TK + 1: IF TK < LT THEN 1030
1060 GOSUB 490:TK = T1:ST = 0: GOSUB 360
1070 GOSUB 430: GOSUB 100:ST = ST + 1: IF ST
      < DOS THEN 1070
1080 ST = 0:TK = TK + 1: IF BF = 0 AND TK <
      LT THEN 1070
1090 IF TK < LT THEN 1020
1100 HOME : PRINT "ANOTHER PROTECTED DISK
      BITES THE DUST" : END
10010 IF PEEK (6400) < > 162 THEN PRINT CHR$
      (4) "BLOAD RWTS.WIZARD OF WORDS,AS1900"
```

Checksums

1000-\$356B	1040-\$6E45	1080-\$6BA1
1010-\$3266	1050-\$ACAE	1090-\$9CC9
1020-\$12A1	1060-\$2DC7	1100-\$95B4
1030-\$04A0	1070-\$25C2	10010-\$11D6

6. Make the following sector edits to side 1 of your copy:

Trk	Sct	Byte	From	To
00	00	4A	AA	D5
		53	D5	AA
		5D	AB	96
		88	AA	D5
		91	D5	AA
		9B	EB	AD
03	1A	AA	AA	D5
		23	D5	AA
		2D	AB	96
		57	AA	D5
		60	D5	AA
		6A	EB	AD

7. Write each sector back to the disk before going to the next sector.

Softkey for...

Snooper Troops- The Case of the Disappearing Dolphin

Spinnaker

Requirements:

The original disk
A blank disk
A sector editor
Any fast copy program

1. Fast copy the original disk to your blank disk.
2. Make the following sector edit:

Trk	Sct	Byte	From	To
1D	03	B7	A9	60

3. Write the sector back to the disk.

Softkey for...

Compucats Quizware Startup Disk

McGraw-Hill

Requirements:

The original disk
A blank disk
A sector editor
Any fast copy program

1. Fast copy the original disk to your blank disk.
2. Search for 34 34 30 33 33 2C 33 35 and change to 34 34 30 33 33 2C 31 37. Then search for 34 37 35 30 35 2C 31 37 30 and change to 34 37 35 30 35 2C 32 32 32.

Don't forget to write each sector back to the disk before going to the next sector.

Softkey for...

Compucats Quizware Data Disks

McGraw-Hill

Requirements:

The original disk(s)
A blank disk for each data disk
A blank INITIALIZED slave disk
A way to reset into the monitor
A sector editor
Super IOB v 1.5

These disks can be deprotected by using Super IOB with the Swap Controller. Use the RWTS of the protected disk to read the original disk; then use a normal RWTS to write the information back to your blank disk. NOTE... Although FID will work in transferring files from the protected disk do not use it. There is information on the disk that is not in the files. Your program will not work properly if you use FID.

1. INITIALize each blank disk with HELLO and then DELETE the HELLO program.
2. Boot your original disk and at the Applesoft prompt reset into the monitor.
3. Move the RWTS to a safe place, where it won't be destroyed when you boot your slave disk, by entering:
1900<B800.BFFFFM
4. Put in your slave disk and boot it by entering:
C600G
5. After the disk boots and the Applesoft prompt appears, insert your Super IOB disk and save the RWTS to it by entering:

BSAVE RWTS.COMPUCAT DATA,A\$1900,L\$800

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

Controller

```
1000 REM COMPUCAT DATA
1010 TK = 3:ST = 0:LT = 35:CD = WR
1020 T1 = TK:GOSUB 490:GOSUB 360:ONERR
      GOTO 550
1030 GOSUB 430:GOSUB 100:ST = ST + 1:IF ST
      < DOS THEN 1030
1040 IF BF THEN 1060
1050 ST = 0:TK = TK + 1:IF TK < LT THEN 1030
1060 GOSUB 490:TK = T1:ST = 0:GOSUB 360
1070 GOSUB 430:GOSUB 100:ST = ST + 1:IF ST
      < DOS THEN 1070
1080 ST = 0:TK = TK + 1:IF BF = 0 AND TK <
      LT THEN 1070
1090 IF TK < LT THEN 1020
1100 HOME : PRINT "A-BEA-BEA-BE<THAT' S<ALL<
      FOLKS" : END
10010 IF PEEK (6400) < > 162 THEN PRINT CHR$(
      4) "BLOADRWTS.COMPUCAT<DATA,A$1900"
```

Checksums

1000-\$356B	1040-\$6342	1080-\$6CA2
1010-\$3565	1050-\$ABA3	1090-\$9DCA
1020-\$6170	1060-\$20C0	1100-\$2611
1030-\$7771	1070-\$28C5	10010-\$A76F

7. Boot your sector editor, read track \$23, sector \$00 from your original disk, then write it back to track \$11, sector \$00 of your copy.

Softkey for...

Math Blaster Plus

Davidson & Associates

Requirements:

The original disk
2 blank disks
Any fast copy program that can ignore errors
A sector editor

1. Fast copy both sides of your original to your blank disks and ignore a read error on track \$22, side 1.
2. Make the following sector edits to side 1 of your copy:

Trk	Sct	Byte	From	To
10	03	8F	85	17
04	01	30	00 00 00 00	A9 2C 8D 96
			00 00 00 00	08 8D 19 98
			00 00 00	4C 85 08

Write each sector back to the disk before going to the next sector.

Softkey for...

Dive Bomber

Epyx

Requirements:

The original disk
A blank disk
COPYA from your DOS 3.3 system master
A sector editor

1. Boot your system master and at the Applesoft prompt enter:
POKE 47426,24 (ignore checksum and epilogues)
RUN COPYA
2. Copy your original disk to your blank disk.
3. Make the following edit:

Trk	Sct	Byte	From	To
\$00	\$0F	\$0E	A9 44 A6 2B 20	A0 08 B9 13 5F
			A3 FB A9 0A 85	99 F7 00 88 D0
			FC A6 2B BD 89	F7 4C 7C 5F 00
			C0 BD 8E C0 A9	E7 FC EE E7 FC
			80 85 FD	EE EE EE

Write the sector back to the disk.

Jeffrey K. Wagner

Introduction to Disk Usage

DOS 3.3 and ProDOS

In COMPUTIST #65, the RPEXed suggested that someone should write an article showing how the ProDOS directory is formatted. While I'm no expert, I decided to give it a shot. I'm going to keep it simple, and start by looking at DOS 3.3 first for

comparison. I'm sure most readers know this already, but remember, we were all rank beginners once! (I remember the first time I used an Apple, three years before I bought my own. I typed in a program, then spent about a half hour trying to save it to disk before I found out you had to format disks before using them!)

Most of what follows is a simplification of discussions in the books "Beneath Apple DOS" and "Beneath Apple ProDOS", both by Worth and Lechner and published by Quality Software. These are "must owns" for anyone wanting to become an expert. The discussion only applies to 5.25" floppies — I'll leave 3.5" disks for someone else to cover.

Tracks

In order to be used, a disk must first be formatted in the drive. While there are differences between DOS 3.3 and ProDOS, there are also similarities: Both systems format a disk with 35 tracks and 16 sectors per track. You can think of tracks as somewhat like songs on a record album: The first track is at the outside, track 0 (decimal and hex), with tracks continuing toward the center of the disk, the last normally being track 34 (decimal, \$22 hex). Note that in counting these, we go from 0 to 34, not 1 to 35. (By the way, I recommend that all beginners try to become familiar with hexadecimal numbers.)

Sectors and Blocks

Each track is divided into 16 sectors. You can visualize these by imagining a pie cut into 16 equal pieces. Sectors are numbered 0 to 15, or \$0 to \$F in hex. If we multiply 35 tracks by 16 sectors per track, we find that the disk contains a total of 560 sectors. In DOS 3.3, files are cataloged according to the number of sectors they contain, and these are the numbers that appear whenever you catalog a DOS 3.3 disk. ProDOS disks also contains 560 sectors, but they are handled differently: Pairs of sectors are combined into Blocks, so that a ProDOS disk contains 280 blocks. It is the number of blocks in a file that show up in a ProDOS catalog. For example, a high-resolution picture in a binary file occupies 34 sectors on a DOS 3.3 disk or 17 blocks on a ProDOS disk, but takes up the same physical disk space in both cases. ProDOS blocks are numbered consecutively, starting with blocks 0-7 on track 0, 8-15 on track 1, etc., until 272-279 on track 34.

DOS 3.3 Specifics

If you use the INIT command to initialize a DOS 3.3 disk, several things happen: First, the disk is formatted into tracks and sectors. Second, DOS 3.3 is written onto tracks 0, 1, and 2. Third, track 17 (\$11 in hex) is prepared as the "record-keeping" area of the disk (more on this later). Finally, your HELLO program is written to the disk. (If you use the "Format a disk" option in Copy II Plus, only the first and third steps occur. A disk used for storing data doesn't need DOS or a hello program on it, since it won't be booted. This gives it extra space for holding data.)

Track 17 (\$11) is the "brains" of a DOS 3.3 disk. Sector 0 contains the Volume Table of Contents (VTOC). The VTOC keeps track of which disk sectors are used or unused. That way, when a file is saved, DOS can look up where free sectors are located, so that an existing file isn't over-written. The VTOC also contains a pointer to where that disk's catalog begins. Normally, the catalog uses the other 15 sectors of track 17, starting with sector 15 (\$F), then continuing in descending order to sector 1 (\$1). Each catalog sector contains a pointer to the next one, with the last such sector having zero at the pointer location to show it is the last. Each of the 15 catalog sectors can hold information about 7 files. For this reason, the normal maximum number of files on a DOS 3.3 disk is 105 (7x15).

You can put more than 105 files on a DOS 3.3 disk by using a sector editor (such as DiskEdit on the Starter Disk) to change the pointer of the last catalog track to a free sector, as well as re-writing the VTOC. I won't go into details of how this is done, but will refer anyone interested to BENEATH APPLE DOS. The excellent Beagle Bros disk, Tip Disk #1 (at under \$20, a real bargain) has a catalog extended in this way.

If you have only a few big files to put on a disk, you can convert unused directory sectors into file storage, again by changing pointers and the VTOC. (Always practice these tricks on a backup until you're sure you know what you're doing!)

ProDOS Specifics

In ProDOS, there is no initializing command similar to INIT in DOS 3.3, so you have to use your System Utilities disk or Copy II Plus to format a disk for ProDOS. Formatting in ProDOS never puts the operating system or a startup program on the disk, so you have to do that yourself with the PRODOS file, a system file (BASIC.SYSTEM, for example), and a startup file (STARTUP, normally, in BASIC).

Does a ProDOS disk contain a "brain" similar to track 17 (\$11) of a DOS 3.3 disk? Sure it does, but it's on track 0, in Blocks 0-6. Blocks 0 and 1 are involved in the booting process, and we don't need to worry about them. Block 6 contains the Volume Bit Map, which performs essentially the same function as the VTOC in DOS 3.3. The Volume Directory of a ProDOS disk is found in Blocks 2, 3, 4, and 5. The directory starts in Block 2 (usually called the "key block") with the name of the volume. After that, Block 2 holds 12 file names. Blocks 3, 4, and 5 each hold 13 file

names, accounting for why only 51 files (12+3x13) fit in the main directory on a ProDOS disk.

ProDOS allows subdirectories, which are actually files located elsewhere on the disk than in the Volume Directory. Subdirectories contain additional file names, so there is really no limit to the number of files on a ProDOS disk, other than space limitation. Some time ago, I had a ProDOS disk on which I wanted to put 5 or 6 big files, but I was 1 block short of having enough space! I used the trick of changing a Volume Directory block to file storage and re-writing the Volume Bit Map, and it worked fine. (See BENEATH APPLE PRODOS to figure out how to do this.)

Track/sector Lists = Index Blocks

In both DOS 3.3 and ProDOS, there is one other aspect of disk usage that needs mentioning. When you attempt to load or run a file, the operating system uses the catalog or directory to find where on the disk the file is located. The first sector of a DOS 3.3 file is called its track/sector list, which is an index showing which tracks and sectors contain the file. The first block of a ProDOS file that is longer than 1 block is called an index block, and it performs the same function. One of the worst things that can happen to a disk, other than having catalog sectors messed up, is having problems with the track/sector lists or index blocks, because this causes problems with them prevent reading in files.

Introduction to Shape Tables

In COMPUTIST #62, Scott Earnest asked about shape tables, and the RDEXed asked if someone would write an explanation. I've done a bit of programming with shape tables, so here goes. This discussion will be limited to High-Resolution (Hi-Res) graphics, but similar techniques can be used with Lo-Res, although very few people seem to use Lo-Res anymore.

The Hi-Res Commands

When you issue the commands HGR or HGR2 from Apple-soft, the Hi-Res screen (either 1 or 2, depending upon which command) is cleared and you're ready to plot on it. You set color with the HCOLOR= command, where white, for instance, is 3 or 7, and you can use the HPOINT command to plot a single point or draw a line. For anything fancier, however, you have to use some programming skills. There are no simple commands, for example, for drawing circles, stars, or anything else.

The Hi-Res screen plots by using little dots. If you wanted to plot a star, you could use the HPOINT command in immediate mode to plot individual points, and by trial and error, you could eventually come up with a star. The easy way, however, is to make a shape table, which is a binary file containing a pattern for drawing a star, circle, little person, or what have you. Then, you can use the DRAW command to plot the shape on the screen.

Creating Shape Tables

Let's first talk about how to make a shape table, then how to use one. You can make a shape table by first plotting what you want to draw on the screen onto a piece of graph paper, then doing some calculations. Take my word for it — it's neither fun nor particularly easy. For details, see Apple's Basic Programmer's Reference Manual. Fortunately, programs are available which do all of the work for you. One commercial example is Shape Mechanic, by Beagle Bros. I've never used it, but based on my experience with other Beagle Bros programs, I'm sure it's a good program. I didn't need to buy Shape Mechanic because I found a good public domain program that does the same thing. I revised it to allow input with the arrow keys (it had originally used letters) and it's served me well. I'm sending the program, since it's public domain, on the disk with this article, but if it's too long to print, maybe the RDEXed can put it on the disk edition for this month.

The PD program, Hi-Res Shape Maker, shows you a large scale grid, 31 squares across the screen and 17 squares high. It is much easier to work with your shape when it is magnified in this fashion, rather than its actual size on the Hi-Res screen. The graphic cursor is moved with the arrows, you use S to start the shape, P to plot a point, R to rubout (erase), and E to end. When done, the program changes the sketch on screen into a shape table and then stores it in memory wherever you want, either by itself or appended to another shape. (A shape table binary file can, of course, contain many shapes). Finally, the shape is displayed, at normal Hi-Res scale, on the screen for verification.

Using Shape Tables

Once we have our shapes in the table, how do we use them? A few years ago, I wanted to write a tutorial program on orbital motion for my astronomy students that would animate planets orbiting the Sun. Plotting shapes was the best way to do it. I made a shape table with a big circle for the sun and a small circle for the planets. Near the beginning of my program, I BLOADed the shape table at \$8B00 in memory. The program has to be able to find the table, so you poke the high bit (\$8B=139 decimal) into location 233 and the low bit (\$0=0 decimal) into location 232 with the statement POKE 232,0:POKE 233, 139.

To draw a shape on the screen, we must get into Hi-Res mode with the HGR or HGR2 command, set the color with HCOLOR=3 (or another desired color), and then set the scale and rotation for

drawing the shape. To control the size of the plotted shape, use the statement SCALE=x, where x can be any number from 1 to 255. Normally, SCALE=1 is used to draw the shape as defined, and larger numbers enlarge the shape on the screen. To control the orientation of the shape, use the statement ROT=x, where x can be any number from 0 to 64. Use ROT=0 to draw the shape right-side-up, ROT=16 to rotate it sideways, ROT=32 to draw it upside down, etc.

Suppose you have two shapes in your table. The command DRAW 1 AT 50, 100 draws shape number 1 at location 50,100 on the Hi-Res screen, while DRAW 2 AT 60,60 draws the second shape at location 60,60. XDRAW 1 AT 50, 100 "erases" the first shape by plotting it in the complement of the color already on the screen. I animated my moving planets in their orbits by drawing them, xdrawing them, shifting their location, and then drawing and xdrawing again.

The best way to master shape tables is to experiment with them, change some parameters like SCALE and ROT, and see what happens. Anyone interested in seeing examples can send me a disk, and I'll return it with a copy of my animated tutorial which uses shapes, and I'll also enclose the Hi-Res Shape Maker program described above. Please include a self-addressed, stamped envelope for me to return the disk in. My address is Jeffrey K. Wagner, Firelands College, 901 Rye Beach Road, Huron, OH 44839.

To Doc Devious: In COMPUTIST #63, you asked if anyone ever heard of DARK II. Our local users' group has a 90-disk collection of public domain programs. DARK is on one of the disks, but I've always felt that it (and a few other programs in the collection) are not actually PD, but pirated commercial programs. When the program runs, it gives a copyright notice of a company called "Microseeds." Although there is no documentation, I've figured out the program pretty well and have used it a few times. I, too, would appreciate any additional information about the program.

To COMPUTIST contributors in general: I've learned much in the year I've been a subscriber, and I appreciate all of the detailed articles about cracking and related topics. I have just one request: If you mention any nifty program you've used or acquired, please give its source. Is it commercial? Public domain? How can COMPUTIST readers acquire a copy? I'm thinking, for example of COPYB, Tricky Dick, Linguist, Disk Muncher, Proshadow, and a few others.

I've seen three programs called COPYB. It's anyone's guess which is the real one. Tricky Dick and Linguist are programs on the CIA (Confidential Information Advisor) disk sold by Golden Delicious Software (England) but I haven't heard anything from them in years. I assume they're defunct. Proshadow was written by Doni Grande and published in COMPUTIST #21. RDEXed

[?] I'm not very familiar with the Pascal language or Apple's Pascal operating system, but I've been attempting my first crack of a Pascal disk (Koalagrams Spelling I, by Koala). From reading other Pascal cracks, I learned that Pascal disks usually COPYA easily, but have a nibble count. (That's true with KS). I scanned the disk for ADEC C0 (LDA \$C0EC), 2000 C6 (JSR \$C600), and 4C 00 C6 (JMP \$C600), but none of these were found. I'd appreciate any suggestions as to what I should be trying next.

Steven Kalynuik

I would like to thank COMPUTIST for the world's greatest newsletter for Apple enthusiasts.

[?] RWTS.WORM question: I am currently using a 'Laser 128EX' computer, which is Apple IIC-compatible. It is made by VTECH, supported by Central Point Software. I am having trouble with the RWTS.WORM program from COMPUTIST #61. The program hangs when CALL 38144 or 300G is executed. I have checked and rechecked the program in memory. Is it possible that my computer is the cause of the problem?

[?] Wizardry IV question: Is there any one out there who can remove the mador charge input from Wizardry IV-Return of Werdna? This is very inconvenient to pull out the stupid blue-printing on purple-paper book every time you want to go up one level.

[?] Does anyone have a softkey for Might & Magic II? I have tried copying it but found that for some reason the program refuses to write new information to disk. It seems to perform a read when it is supposed to be writing information to disk. I find this kind of copy protection to be quite effective. Also, is there a way to remove the intro picture portion of the program for a faster load?

I noticed a comment in the Product Monitor (in COMPUTIST #65) about Wizardry V: Heart of Maelstrom. You mentioned something about a bug in the Wizardry series. The bug mentioned was the unfortunate change of alignment of a character, that causes problems in your favorite party. I assure you that this is not a bug but a fact as in real life. If a good character/person is presented with a choice to fight or leave, an action opposite that of their alignment will someday change that person's alignment, until they reverse the above condition in the future. This is the best scenario yet, so say my Level 15 to 20 characters.

Joseph P. Karwoski

Disk Protection on the Apple II

Here is a collection of deprotection techniques, gathered from COMPUTIST and other sources. I have seen many questions like "How do I deprotect a program?", I hope this paper will give you some insight into the hows and whys.

This information is written to help people understand how copy protection is used on the Apple II family of computers. It is also written to give people an overview on how to "deprotect" protected programs. As a reminder, it is illegal to copy any copyrighted material for the purpose of giving it away. You do have the right to copy a computer disk for the purpose of having a "back-up".

I will attempt to show you how some programs are protected, and a method for "getting around" this protection. You may want to deprotect your programs for two reasons:

1. to allow you to make a back-up of your program, and
2. to allow you to place your programs on your hard drive.

It is beyond the scope of this paper to give a detailed explanation of the protection used. To completely understand the process, you need a total understanding of machine programming. I will try to make this paper simple enough for everyone to understand, but yet complete enough to be useful to the experts.

This paper is divided into two major sections - Apple IIgs and Apple IIe.

Apple IIgs

IIgs Protection Techniques

As of now, there are only three ways of protecting a disk for the Apple IIgs (that I have seen).

1. They can put a "signature" on the disk. The program will check the disk for this "signature" before the program will "RUN". They may also check the disk while the program is running. This may include a nibble count, some type of checksum routine, a bad block, or a combination of any of these. Most of the Apple IIgs-specific programs that I have seen use this method.

2. They can customize the DOS they are using to read from and write to the disk. They change the normal disk format, and a sector editor cannot read the disk. Normally the sector editor can still read block zero - the computer has to know how to read the disk to begin the program. These changes may include altered address prolog, data prolog, address epilog, and data epilog. They may also have developed their own version of ProDOS. This type of disk is very hard (at times) for the beginner to deprotect. I recommend that the beginner get out a copy of Copy II+ and use the techniques there to change the parameters and use the manual bit copy option.

3. Some combination of the first two.

It is beyond the scope of this paper to cover the techniques needed to deprotect the second and third options. I will try to concentrate on the first method only. It is usually easy (although it may be time consuming) to deprotect a program that is using a "signature" type of protection.

Apple IIgs Backup Procedure

Here are the steps you should follow to back-up your Apple IIgs programs:

1. Copy the program - I use Copy II+, using the "disk with format" option or the sector copy. This will usually copy the disk (but it will not work). If you get an error reading a track, then they are using a "bad" block type of protection. If there are no errors (and the disk does not work), then they are using a nibble count.

2. Keep a record of everything you try, and what has happened. This will save you a great deal of time in the long run. This will help keep you from going in circles, and help you retain your sanity.

3. Boot your copied disk and see what happens. This will sometimes give you a good idea where to look to find the protection code.

4. Get out your sector editor and try following their program code. If you don't know how to do this, you will find the list that I will give you very helpful.

5. When you think you have found the protection, modify the disk. NEVER change the original!! You are going to try to either by-pass the protection or fool the program into thinking that it has been satisfied.

6. Go back to step #2.

7. Once it is deprotected, run the program to make sure you found all of the protection. Sometimes, a program will boot, but then will not run.

The following is a list of companies and the protection that they like to use, along with ways of getting around their protection.

To use these, you will need to use a sector editor to find the "search for" bytes and then change them to the "change to" bytes. Another good thing to remember is that a company will often use the same protection (with minor changes) on many of their programs. This is true because once a company buys and/or develops a protection system, they will want to get their money's worth out of it.

IIGs Edits by Publisher

Accolade IIGs
 Search for Change to (Notes)
 D0 42 80 35 (Block 31 byte 4C)
 A2 20 80 2C (Block 98 byte 1A8)
 AD 98 00 D0 03 82 D3...00 A5 F0 F0 03
 9C 98 00 EA EA A9 01...00 85 F0 EA EA

Activision IIGs
 Search for Change to (Notes)
 0C 00 C9 01 00 F0 0C 00 C9 01 00 80
 C9 07 00 D0 01 EA EA EA EA EA
 82 82 00 EA EA EA
 18 FB C2 30 A9 01 00 6B
 F0 80 (Only one needs to be changed. It is normally above block 240 -[44x].)

Baudville IIGs
 Search for Change to
 22 DB C4 00 AF DB C4 00

Broderbund IIGs
 Search for Change to (Notes)
 08 E2 30 A2 20 60 E2 30 A2 20 (This places a "RETURN" at the beginning of the protection. It can also be found by searching for A2 20 A0 01.)

AB 20 61 42 20 AB 20 61 42 60
 F0 AB 20 61 42 20 4F 67 F0 AB 20 61 42 EA EA EA
 20 4F 67 20 57 68

Cinemaware Inc IIGs
 Search for Change to (Notes)
 9C E1 17 20 E3 17 AD E1 17 9C E1 17 AD E3 17 AD E1 17
 A2 20 A0 01 or A2 21 A0 01 (For these two, look around the code - change 20 (JSR) to AD (LDA) and/or change F0 (BEQ) to 80 (BRA).)

Electronic Arts IIGs
 Search for Change to (Notes)
 20 00 37 EA EA 38
 20 00 37 B0 0C 20 00 37 90 0C
 20 00 BF C5 42 49 20...C2 4A 90
 EA EA EA EA EA EA EA...EA EA 80

20 1A B5 A9 01 60 1A B5 A9 01
 78 98 E9 1E B0 78 98 E9 1E 90
 E9 20 90 01 38 E9 20 90 01 18 (These last two are normally used together, look for both.)

22 00 36 00 AF 00 36 00
 22 00 10 00 AF 00 10 00
 A9 00 8F 55 A2 00 38 A9 01 8F 55 A2 00 18
 20 2E 36 EA 38 EA
 B0 98 EA EA (These two are usually together, around Block 13.)

EPYX IIGs
 Search for Change to (Notes)
 20 3C 20 EA EA EA
 20 60 00 AD 60 00
 E2 30 80 38
 B0 0C C2 30 (These last two are usually found on the same disk. If you find one, don't forget to change the other.)

Grolier IIGs
 Search for Change to
 4C F8 00 BD 8C C0 4C F8 00 18 60 C0

MicroProse IIGs
 Search for Change to
 F0 05 A9 20 EA EA A9 60

Mindscape IIGs
 Search for Change to
 22 00 90 00 C9 02 AF 00 90 00 80 03

PBI IIGs
 Search for Change to (Notes)
 22 CB 1B 00 EA EA EA EA
 C9 0B 00 F0 03 A9 00 EA EA EA EA EA A9 0B (Change the 22 prior to this to AF.)

C9 0B 00 F0 03 A9 0B 00 80 03
Sierra On-line IIGs
 Search for Change to (Notes)
 00 F0 04 22 00 00 00 22 00 F0 04 22 00 00 00 AF
 22 8D 0A 00 AF 8D 0A 00
 F0 04 22 00 00 00 22...00 00 00 AE
 F0 04 22 00 00 00 AF...00 00 00 AE

00 F0 1E 22 00 00 80 1E 22 00
 C9 00 00 D0 06 C9 00 00 80 06
 22 00 00 00 22 00 22 00 00 00 AF 00
 C9 27 02 F0 04 22 C9 27 02 F0 04 AF (This is used with another one of the protection plans. Normally with the first one. The program will load about 80 percent and then crash. If this happens, look for these bytes.)
 AD 00 00 18 6D 00...00 C9 27 02
 6B 00 00 18 6D 00...00 C9 27 02 (This one is used with another type, and is a different way of solving the previous problem.)

Software Toolworks IIGs
 Search for Change to
 22 00 00 00 7A 7A A8...D0 12 F4 17 00
 22 00 00 00 7A 7A A8...80 12 F4 17 00

Springboard IIGs
 Search for Change to (Notes)
 20 00 42 18 90 03 (There will be an error on track 20 when you first copied this program.)

Unicorn IIGs
 Search for Change to
 A2 21 A0 01 80 2C A0 01
 8B 08 4B AB 48 6B 08 4B AB 48

IIGs Deprotection Tricks

Here are a few other tricks that may be of help to you when you are looking for the protection code, or at least a way of getting close to the code.

1. If you got a "bad" block when you were copying the program, you will want to search for the "block read command". Here is what you look for:

- A. Under ProDOS 16, search for 22 A8 00 E1 22.
- B. Under ProDOS 8, search for 22 00 BF 80.
2. If you are looking for a nibble count, search for A2 20 A0 01.

Once you find the protection code, you may want to change the following code. Remember, NEVER change an original disk!

1. Change 20 (JSR) to 8D (LDA).
2. Change 22 (JSL) to AF (LDA).
3. Change BCC, BNE, etc. to NOP (EA), or to BRA (80).

If all else fails, you may want to plant a "bomb" in the program code. A "bomb" is a small program that you insert into the program itself. The purpose of the "bomb" is to give you more information about the protection. If you can't find where the protection is, you may want to try reverse logic - find out where the protection is not!

There are many different types of bombs that you can use on the Apple computer (I will mention a few more when I talk about deprotecting on the Apple IIe). The one that I like to use on the Apple IIGs software is: 68 FA 00 (PLA PLX BRK). This is very useful, for example: If you wanted to know where a program was calling a certain routine from, you would place the bomb at the beginning of the routine and watch what happens. When the program encounters the 00 (BRK), you will be out of the program.

If you are still in the graphics mode, try using CTRL-T to enter the text mode. On the screen you should see something like this: A = 7C77 X = nn03. This is telling you that the call was made from 0377C7x, where x = the value minus the length of the instruction. This will tell you where in memory to look to find the program code. From that you may be able to find some clue of where the protection code is on the disk.

IIGs Extra Desk Accessories

Here is an interesting note for the Apple IIGs computer that some people still don't know about. You can add 2 new desk accessories to your control panel, Memory Peeker and Visit Monitor. You get these new commands by:

1. Get into the monitor (boot your system and type CALL -151).
2. At the "*" prompt, type # and press return.
3. When you get to the control panel, (CTRL-OPEN APPLE-ESC), you will see the two new commands: A. Memory Peeker, and B. Visit Monitor.
4. ctrl-Y will get you back to the control panel.

Apple IIe

As of now, there are only three ways of protecting this software. These three ways are the same as for the Apple IIGs (review these ways if you have forgotten them).

Deprotecting with COPYA

When you are working with Apple IIe programs, you can use a very powerful program that Apple itself has given us - COPYA. This program is found on the DOS 3.3 system master. In its original form, the program will copy unprotected DOS 3.3 and ProDOS programs. With a few minor changes we can make this a very effective copy deprotection program. In the following charts, I will give you a list of changes you can make to COPYA to help you in your deprotection (backup) process. To make these changes, do the following:

1. Boot the System Master.
2. Type "RUN COPYA".
3. When it asks what is the source slot, press ctrl-C.
4. Type "CALL -151".
5. Make the changes you want.
6. Type "3DOG" and press return.
7. Type "70" and press return.
8. Type "RUN" and press return.

COPYA Modifications - Chart 1

Ignore what	\$Address	Change to
Address field Prolog	D5	\$B954 29 00
	AA	\$B95E 29 00
	96	\$B969 29 00
Epilog	DE	\$B990 29 00
	AA	\$B99A 29 00
Both epilogs		\$B988 18 60
Data field Prolog	D5	\$B8E6 29 00
	AA	\$B8F0 29 00
	AD	\$B8FB 29 00
Epilog	DE	\$B934 29 00
	AA	\$B93E 29 00
Both		\$B925 18 60
Checksum		\$B98A 00
DOS Read error		\$B942 18
Read/Write error		\$B7C0 18
RWTS error		\$BE48 18

Here is an example of what you would type if you wanted to ignore both Address epilogs:
B988:18 60

That is all there is to make the changes you will need to change COPYA to fit your needs. If you would rather use POKE statements to change COPYA, just look at the next chart to find what you will need. The steps needed to make the changes are as follows:

1. Boot the System Master.
2. Type "RUN COPYA".
3. When it asks what is the source slot, type ctrl-C.
4. Make the changes you want.
5. Type "70" and press return.
6. Type "RUN" and press return.

COPYA Modifications - Chart 2

Ignore what	POKE statement
Address field Prolog	D5 POKE 47444,41: POKE 47445,0
	AA POKE 47454,41: POKE 47455,0
	96 POKE 47465,41: POKE 47466,0
Epilog	DE POKE 47507,0
	AA POKE 47517,0
Both epilogs	POKE 47496,24: POKE 47497,0
Checksum & Epilog	POKE 47426,24
Data field Prolog	D5 POKE 47334,41: POKE 47335,0
	AA POKE 47347,0
	AD POKE 47358,0
Both epilogs	POKE 47397,24: POKE 47398,96
Checksum	POKE 47392,234: POKE 47393,234
RWTS error	POKE 48712,24

If you wanted to change both the Address Checksum and Epilog you would type:
POKE 47426,24

You may be asking yourself, "Why do I need to know about something called COPYA?". The answer is rather complex. When a company protects a piece of software, they are trying to make it hard for you to read the disk. One way of doing this is to change the Address Epilog from standard to something "odd". Sometimes you can't read a disk using Copy II+ sector editor until you convert the disk into a "readable" disk. If you are good with the nibble editor on Copy II+, then you can read each track and set the sector copy option from Copy II+ to read that. If you can't use the nibble editor very well, you may want another method of getting the disk into a standard form. This is where COPYA comes in. COPYA will let you take a disk that is not in standard form and put it in standard form, given the proper information.

One of the most powerful changes you can make to COPYA is the "POKE 47426,24". This is so powerful because a lot of the protection schemes use altered address epilogs and checksums. Many times you can deprotect (or at least get a COPYAble) disk by using this, and then copying the files to a newly formatted disk (if the protection is in their DOS). You are now asking - What do I do, I don't have "COPYA"? What is a DOS 3.3 System Master? If you are new to the Apple world, you may not know what any of this is - don't worry. You can make the changes you need to your Copy II+ disk. Here is what you need to do:

Boot your Copy II+ disk and get into the manual sector copy option. After you enter all the requested information, you will be asked to insert the disks and press return. At the bottom of the screen, you will see a little "menu". If you press the "/" then you can modify the parameters that the program uses. When you press "/" you will see "Change What?", at this you can enter the value to change and then press return. A simple RETURN when asked what to change will get you back, ready to copy. Here are a couple of the changes that will help you - if you want more, look in the

manual that came with your Copy II+.

Address epilogs: change 60 to 00
Data epilogs: change 6B to 00

Apple IIe Sector Edits

The following is a list of companies and the sector edits to get around their protection. Remember, only use this information to make a back-up copy of your program. Do not copy a program and give it away — *It is illegal!!!* To make some of the edits, you will have to use COPYA with one of the edits I have given you. If you don't know which one to use, try "POKE 47426,24".

To use these, you will need to use a sector editor to find the "search for" bytes and then change them to the "change to" bytes. Another good thing to remember is that a company will often use the same protection (with minor changes) on many of their programs. This is true because, once a company buys and/or develops a protection system, they will want to get their money's worth out of it.

Accolade IIe

Search for	Change to	(Notes)
F0	D0	(This is usually found around TOE, S00.)
A0 09	18 60	(This is usually found on T00.)
4C 00 C6	EA EA EA	(This is usually found on T00.)
20 60 B2 F0	EA EA 18 90	(This is usually found on T00.)
20 30 20 F0	CE F4 03 EA	
03 4C 00 06	EA EA EA EA	(These 2 are usually found on the same disk, normally found around T13.)

20 60 B2 EA A9 00

Activision IIe

Search for	Change to	(Notes)
A9 56 85 FD A9...	EA EA EA EA...	
...A9...38 2A 25 FC	...EA...EA EA A9 FF	

Addison-Wesley IIe

Search for	Change to	(Notes)
4C 2A 02	EA EA EA	

Broderbund IIe

Search for	Change to	(Notes)
20 00 01	EA EA EA	
4C 00 1F	18 90 F4	
78 AD 82	4C 00 60	(These 2 are usually found on the same disk, usually around T00.)

A0 00 A9 FF 60 00 A9 FF

Channelmark IIe

Search for	Change to	(Notes)
AD E9 C0	18 90 4C	(This usually must be changed in 2 places on the disk.)

Electronic Arts IIe

Search for	Change to	(Notes)
4C 69 A0	18 60 DD	
4C 69 05	60 69 05	(These 2 may be found on the same disk. Sometimes the first one is found in 2 different places on the disk.)

02 97 EE 00 A6 EE 00 A6 EE 02 97 EE

6C 54 00	18 60 48	
4C 69 A0	18 60 DD	(Usually these 2 are found on the same disk. The second one is sometimes found twice on the same disk.)

4C 69 A0 18 60 DD (Sometimes this is the only protection on the disk.)

20 E2 0D 18 60 97

FF 48 D8 33 A6 89...	6A 1D FF EC A1 80...	
...FD E2 44 38 DB E3 51 3A		(Usually these 2 are found on the same disk.)

4C 69 A0	18 60 DD	
A2 0F B5 50 48	AD E8 C0 68 68 18 60 0A	(These 2 are usually found on the same disk, around T01.)

4C 69 A0	18 60 DD	
4C 69 BD	18 60 F9	(These 2 are usually found on the same disk. The first one is often found twice on the disk.)

4C 69 A0	18 60 DD	
4C 6A 30	18 60 6E	(These 2 are usually found on the same disk.)

EPYX (Lucas Film) IIe

Search for	Change to	(Notes)
38	18	(This is usually found around T00, S03.)

BD 89 C0 BD 8E... A9 FC 85 F3 85...

...C0 A9 80 85 FD... ..F0 A9 EE 85 F2...

...C6 FD F0 7A 20 ...85 F1 4C 7A BB

20 AD 09 4C 7F 09

00 00 00 00 00 00 00 FC EE EE FC E7 EE FC E7

BD 8C C0 AD F1 BB

BD 8C C0	B9 F0 BB	(These 3 are usually found on the same disk. They are usually around T00, S05.)
----------	----------	---

4C 00 06 18 EA EA

4C 6E 08 20 41 0B

00 00 00 00 00 00 00... A9 D7 8D F0 03 A9 F9 8D...

...00 00 00 ...F1 03 60

(These 2 are usually found on the same disk. Usually the first one is found around T00, S00. The second one is usually found around T00, S06.)

D0 F4 EA EA

D0 1F EA EA

(These 2 are usually found on the same disk, usually around T00.)

D0 F4 EA EA

D0 20 EA EA

(These 2 are usually found on the same disk, usually around T00.)

Hartley Courseware IIe

Search for	Change to	(Notes)
38	18	(This is usually found around T00, S03.)

Learning Company IIe

Search for	Change to	(Notes)
20 9E 63	EA EA EA	
20 12 17	EA EA EA	(These 2 are usually found on the same disk.)

Learning Technologies IIe

Search for	Change to	(Notes)
D0 D8	60 EA	

MicroProse IIe

Search for	Change to	(Notes)
4C 3D 02 4C C2	4C 9D 02 4C C2	
08 95 85 68 60...	A9 95 85 32 60 F7 A9...	
	...18 85 02 60 F9	(These 2 are usually found on the same disk.)

Mindplay IIe

Search for	Change to	(Notes)
A2	60	(This is usually found around T00, S01 (first byte).)

Mindscape (Tom Snyder and Alert) IIe

Search for	Change to	(Notes)
4C 00 06	EA EA EA	
20 00 02	18 60 42	
BD 8C C0 30 03	BD 8C C0 EA EA	
4C 00 4A	EC DB 43	
20 AF 5B	EA EA EA	
20 44 B9	EA EA 60	
4C 00 06	EA EA 60	
38	18	(If you use COPYA with POKE 47426,24, this edit should be around T00, S03, byte 42.)

D0 F8 4C 00 C6 EA EA 4C DB 43

C6 F4 D0 94 38 A9 A0 85 F4 18

4C 47 22 EA EA EA

D0 F1 A0 18 60 EA

Origin IIe

Search for	Change to	(Notes)
20 00 FF	EA EA EA	

Polarware IIe

Search for	Change to	(Notes)
F0 FE	EA EA	(This should be found around T13.)

A0 89 A9 4C A3 46

4A 6D A7 4A 46 B9 8F 1A (These 2 are usually found on the same disk.)

A2 03 B5 00 A9 56 60 FB (This one is often found in two places on the disk, around T10, and T11.)

Random House IIe

Search for	Change to	(Notes)
38	18	(This is usually found around T00, S03.)

Sierra On-Line IIe

Search for	Change to	(Notes)
A9 00 AA AB	60 00 AA AB	
20 00 FF	EA EA EA	
C9 C9	29 00	
20 17 0A	EA EA EA	
C9 C9 D0 0D	29 00 D0 0D	
20 00 1D	EA EA EA	
CE 03	60 AD	(This is usually found around T06, S06.)

Sir-Tech IIe

Search for	Change to	(Notes)
A9 0D	18 60	(This is usually found around T0C, S09.)

Spectrum Holobyte IIe

Search for	Change to	(Notes)
AD E9 C0 A9	A9 01 D0 87	

Spinnaker IIe

Search for	Change to	(Notes)
A5 1E	A9 F0	(This should be around T01, S03.)

Strategic Simulations IIe

Search for	Change to	(Notes)
A8 D0	18 60	

Styleware (Scholastic) IIe

Search for	Change to	(Notes)
BD 8C C0 10	A9 00 18 60	

Sunburst Communication IIe

Search for	Change to	(Notes)
10 F7 30 FE D5 CE	10 F7 EA EA D5 CE	
28 38 60 28 18 60	28 18 60 28 18 60	(These two are usually found on the same disk.)

Telarium IIe

Search for	Change to	(Notes)
AD 82 C0	20 29 1C	

Apple IIe Deprotection Tricks

Here are a few other tricks that may be of help to you when you are looking for the protection code, or at least a way of getting close to the code. Remember, NEVER work with the original disk - use a nibble copy of the original!

1. Boot the original disk (an exception to the cardinal rule). Pay close attention to what the screen looks like and the noises that the drive is making. If the drive sounds like it is re-booting, you can be pretty sure that a "nibble count" is taking place. If the standard "J" or the ProDOS intro screen appears, you are most likely dealing with a disk that is close to standard format.

2. Get out your copy of Copy II+ and try to CATALOG the disk. If the disk can be CATALOGed, you are probably dealing with a "signature" check. If you are only dealing with a "signature" check there are a few things that is pretty standard, and they are: the disk can be copied with any whole disk copier, the disk can be CATALOGed, and the disk will not work. The disk may boot, and even may run for a while. But when it tries to find the "signature", it will stop. Sometimes, such as in some versions of Print Shop, the program will work until you try to print something - then it will crash.

3. Get out your sector editor and start looking around. You are now asking yourself, "LOOK FOR WHAT?". That is the hard part, but I will try to give you a few pointers. The first thing you may want to do is try the sector edits I gave you. If that does not work, you are going to have to do a little more work. Remember, these companies want to make it hard for you to do what you want to do. The thing about it is, if you want to get another copy of the program from the company (after your program dies), you will have to pay them 10 to 20 dollars and have to wait 3 to 12 weeks for it. This is taking money from your pocket and putting it in their pockets - they like that!

Back to what is important - what to look for. Use your sector editor's search command to look for "8C C0"; this is a direct read from the disk. Look around the code to see what this read is looking for (there will usually be some type of comparison being done). If it is looking for something normal ("D5", "AA", "96", "AD", or "FF"), keep reading. If you find something different, you will have someplace to start working.

Try to disassemble the code and follow what they are trying to do. You may want to replace the code with "00 00 00..." (BRK) to see what will happen when the disk is booted. If the disk is re-booting when you try to reset into the monitor, you may want to try searching for the bytes "8D F3 03", "8E F3 03", or "8C F3 03". This is where the computer keeps its reset vector. If the program is storing "00 C6" then this is why the disk is re-booting - this is the "turn disk drive on" sequence. You may want to put a "bomb" there to see what will happen.

Here are a few "bombs" that I like to use:

a. "4C 69 FF" - This will cause the computer to drop into the monitor. From here you can look around to see what they are trying to do.

b. "20 3A FF" - This will cause the computer to "beep". You may want to try this to see if the program does anything else, or to tell you when a certain code is used. This may come in handy if you are just guessing, and you need more information.

c. "4C 00 C6" - This will cause the computer to re-boot. You do not want to replace a re-boot code with another re-boot code, however you may want to try this on a different type of code - just to see what happens. This can be used to see if a certain code is being called.

4. When you are ready to overwrite a code, there is one thing you should check for — a *checksum*. Check the last byte on the page to see if it is part of the instruction code. If it is you may be home free, if it is not then you must "balance" the code to make the program think that everything is A-OK. For example, on some of the Electronic Arts products there may be only one sector edit needed. You will need to change "4C 69 A0" with "18 60 DD". Really the first two bytes set the carry flag and then returns. The third byte takes care of the checksum. Lets do a little math to see why you had to change the "A0" to "DD". I will change all the bytes to their base 10 numbers so you can see what is going on a little easier. "4C" = 76, "69" = 105 and "A0" = 160; the total of these numbers is 341. "18" = 24 and "60" = 96, this gives us a total so far of 120. Since this program uses a checksum, we are 341 - 120 = 221 too low. We must replace the last byte with the value of 221, this is the hexadecimal number "DD".

If the disk is using a signature check, you will have to get

around it. Here is a process that you may find helpful in doing just that.

First, you will have to find where the signature check is. One way of doing this is to search your disk for "8C C0". This is the code for reading the disk. (I mentioned this earlier, remember?). If you find a disk read outside of DOS, beyond track 3, you may want to take a close look at what it is looking for. If it is looking for something different than is normal (D5, AA, 96, or AD), you may have found the signature check.

Once you find the code, replace it with "00 00 00" and reboot the program. You should see something like:

```
3022: A = 55 Y = 2 X = 60 P = 10 S = F5
```

This is telling you that the program "hit" your "00 00 00" somewhere around 3020, and what the values in the registers were.

Look at the code around the area of 3000. You should find a set of RTS (return) with code between then. This code should be where your signature check is taking place. Find the address of the code after the first RTS (lets say it was 3016).

Since the code returns using an RTS, you may a good chance that there was a JSR to that signature check. Also, since the code ends with an RTS, we may be able to find the JSR and NOP (EA) it out. Search the disk for "6D 30", and NOP (EA) the jump out. This may solve the problem of the signature check.

If you find that the disk still will not boot, you may have missed something simple like setting the carry flag (18). Look through the code to see if this is what happened. If it is, set the flag and go on your merry way. If not, or if the disk still will not work, you will have to do a little more work. Obviously, the program is storing something it needs to continue.

What the program is doing is something like this:

1. Read the disk.
2. Store some bytes (maybe needed to "unscramble" some code).
3. Return to the program.

What we now have to do is change the code to do this:

1. Store the needed bytes.
2. Return to the program.

You are now saying, "Sounds easy on paper, but how in the world do I do it?". It is not that hard, but it may take some time. Check the code for any STA, STX, STY, LDA, LDX, or LDY instructions. Write down the memory locations and then place a BRK (00) where the ending RTS is. Now, when you boot the disk and it passes the signature check it should break and leave you in the monitor. At this point you can check the memory locations for the needed values and the registers for the needed values. Write down these values and get ready to write the code that will store the needed information in the correct places. Don't worry, this is not as hard as it sounds either.

Let's say that we have this information:

Memory Location	Needed Value
\$FC	00
\$FD	05
\$30D4	55

Register	Needed Value
A	55
X	60
Y	03

The code would look something like this:

```
A9 00 LDA #$00
85 FC STA $FC
A9 05 LDA #$05
85 FD STA $FD
A9 55 LDA #$55
8D D4 30 STA $30D4
A9 55 LDA #$55
A6 60 LDX #$60
A0 03 LDY #$03
60 RTS
```

Now, all you have to do is insert this code at address 3016 and you should have solved the problem of the signature check. I have used a simple signature check to demonstrate how to solve the problem. You may find some that are much harder to follow. Don't give up, just work a little harder at learning the code.

Now you have a great deal of information on how companies copy protect their programs. This is by no means complete, but it will give you a good starting point and a reason for learning machine code. Also, remember that these companies are always looking for new ways of protecting their software.

Copy Protecting Your Own Disks

You may be interested in protecting your own disks. I will give you a really easy way of making your disks a little more difficult to copy. This is for DOS 3.3.

Put the Catalog/VTOC on another track

1. Boot a DOS 3.3 disk, then load the program you want to protect.
2. Patch DOS 3.3 to format track #35 which will give you 36 tracks, instead of the normal 35.

CALL-151

B3EF:24
B3FE:24
AEB5:90
3D0G

3. Tell DOS to put the CATALOG track on track \$23 (decimal 35), and not on \$11 (17), which is where it usually is.

POKE 44033,35
INIT name

4. Use a sector editor to read track \$11, sector \$00 and change byte \$01 from 11 to 23. Write the sector back to track \$23, sector \$00.

Forcing a Reboot

You can wipe-out the reset vector and cause the computer to re-boot when ctrl-reset is pressed.

1. Search for 60 4C BF xx (xx could be anything) and change to 60 4C 00 06.
2. Write the changed sector back to the disk.

Delete DOS Commands

Use the sector editor to wipe-out or change any commands you don't want used. You do this by searching for the commands in DOS and changing them to other words or nonsense sequences such as: SAVE into PARK, LOAD into DROP, INIT into ZAPP, CATALOG into SHOWCAT, etc.

No LIST please

An interesting POKE is POKE 2049,1. This will only list the first line of the program. If it is a REM statement like: 1 REM... NOT LISTABLE, that will confuse some people.

Use the information that I have given you to protect yourself from the heartbreak of destroying your "one-and-only" original copy of your program. ALWAYS make a back-up!

Playing Tip for...

Alien Mind

PBI

Here is something for the "game players". In the game Alien Mind, here are the passwords that I have found:

Telegram	Sombrero	Aqua	Glass
Hammock	MC1XXIV	Radiation	Ear
Elevator	Telescope	Judy	Atlantis
Siren	Transit	Biologist Ho!	Oasis
CDEFGAB	Hieroglyphics	Light	Easel
Bio-Lab			

After I got to this point, I found that a small "n" will take you to the next level. This will even take you past the Alien.

Playing Tip for...

Defender of the Crown

?

The next tip that I have is for Defender of the Crown. Using the SHIFT-OPTION-APPLE keys will "change" the odds in your favor. When you go to buy any soldiers, you can get them "for free" if you hold these keys down while you buy them. You can then get a refund on them and buy whatever you want with your new-found wealth. These keys also do other interesting things, but I will leave them to the "gamers" to find out.

Roger Williams

Softkey for...

Rampage

Activision

Normally the first thing I do when I get a new program is check out the back issues of COMPUTIST to see if I can save some cracking time. I didn't check on Rampage before I had it cracked, and since my crack is different I offer it for its possible educational value.

Mr. Brown, in his softkey from COMPUTIST #63, NOP'ed all the code from 41 to 80. He then made one further change at 81-82. Hopefully, I accomplished the same by editing only two bytes.

Trk	Sct	Byte	From	To
00	0D	57	ED	00
00	0D	62	B0	80

Softkey for...

Fantasyland

Learning Well

Once again it's time for the old COPYA with no error checking. Then a one byte edit will allow the program's DOS to read the non-protected disk.

The original code was as follows:

```
XX2F BD 8C C0 Read byte from disk
```

```
XX32 10 FB Not good? Get Another
XX34 C9 BF Compare byte to BF. On a normal disk it should
be compared to DE.
```

Cookbook:

1. Boot a DOS 3.3 system disk.
2. Tell DOS to ignore checksum and epilog errors and use COPYA to copy the disk.

```
CALL -151
B942:18
3D0G
RUN COPYA
```

3. Boot your favorite sector editor and edit one byte:

Trk	Sct	Byte	From	To
00	03	35	BF	DE

Notes on Printing thru the GS Serial Port

Several graphics programs that were and still are being written, that are not Apple IIgs-specific, do not give the GS port as an interface option. At least it's not always listed as "GS port". A program called Swimwear, which prints a swimwear annual calendar for all of us degenerate unliberated males, lists 5 different interfaces including Apple Super Serial and Apple IIc. These did not work for me with the Imagewriter II.

The correct choice is disguised as "NSSC Pascal", which I assume is the Pacal 1.1 Firmware Protocol that we have read about. Anyway it works. In many instances the Super Serial Card does not work because of addressing differences in the firmware. Another choice that will work is "Laser 128 Serial Port". Hope this helps get some older graphics programs back into production on the GS.

Stanley Planton

And Never the Twain Shall Meet?

Making a disk that will work in BOTH Apple and IBM systems

Requirements:

Apple computer with 5.25 in. drives
DOS 3.3 / ProDOS / and/or DOS-ProDOS utilities
IBM PC or PC clone with 360K 5.25 in. drives
PC-DOS or MS-DOS and/or MS-DOS utilities
Disk notcher
DSDD disks

Noting that some software publishers have been issuing disks with the Apple II version of a program on one side and the IBM PC version on the other, a do-it-yourself experiment in creating a multi-computer disk seemed called for. The creation of a disk that will boot in both computers is a fairly simple task, and requires no "hacking" skills. To create a disk that will allow you to use three different systems, i.e. DOS 3.3 AND ProDOS AND MS-DOS together, is also possible using Brian Chinn's instructions from COMPUTIST's #25 and #43 for the DOS-ProDOS side of the disk.

The following procedure should allow you to create a disk that is usable on one side as a 180K IBM disk, and a standard DOS or ProDOS Apple disk on the other side.

Apple Formatting:

1. Format your disk as usual for whichever operating system you are using in your Apple. If you are intending to make a "dual DOS" Apple side, follow the instructions in COMPUTIST #43 to format the disk for BOTH DOS 3.3 and ProDOS.
2. Remember that DOS 3.3 "lives" in tracks \$00-\$02 if you want to make a bootable disk, and that ProDOS must be copied to a ProDOS disk in order to make a ProDOS disk bootable. DOS likes having a "HELLO" program of some kind and ProDOS requires a SYSTEM program in order to boot.

There are various utilities that will allow the formatting of extra tracks for both Apple operating systems; these are compatible with this overall method, since we will be using the OTHER side of the disk for IBM applications.

IBM Formatting

1. Use a disk notcher to punch an extra read-write notch in the disk, opposite the "factory" notch. If you don't have a disk notcher, flip another disk over, lay it on top of the disk to notch so that its notch overlays where you want to make a hole, and mark the spot. A small, sharp instrument can then be used to cut the notch. Be very careful, since SOME IBM drives are very particular about the size and placement of the read-write notch, and you may get errors when you try to format the disk if you aren't precise. From personal experience, it appears that some of the more haphazard methods of cutting notches in widespread use, such as using three-ring hole punches, are not likely to work in many IBM PC drives...

2. Boot your favorite flavor of MS or PC-DOS in the IBM computer. The disk containing the DOS should also contain the FORMAT.COM file. Note that there have been innumerable versions of these operating systems floating around, and there can be occasional compatibility problems. Generally speaking, the DOS 3.21 and 3.3 versions seem to be the ones with the fewest idiosyncracies...

3. Turn over the disk you are to format in the IBM system; you will want to format the "back" of the disk, so the notch you just cut should be on the LEFT side as the disk is inserted. The "back" side of the disk should be UP.

A momentary digression: It seems to be normal for the "down" read-write head to do single-sided formatting in most disk drives, regardless of the system. This means that you are formatting the side OPPOSITE the label. When you insert a disk into an Apple, you are actually using the side that is DOWN in the drive; the IBM works the same way for single-sided use, so flipping the disk works to provide a fresh surface to format. It is a VERY good idea, therefore, to treat the DOWN side of all disks with special care; many users will carefully insert and remove disks from the drive, then lay them label side up in a pile of eraser crud and dust on the top of the desk. This GUARANTEES that your data is exposed to the the maximum amount of junk...

4. Making sure that the previously unused side of the disk is DOWN in the IBM drive, proceed with formatting the disk, using the sacred /1 suffix in the FORMAT command. This will allow the disk to be formatted ON ONE SIDE ONLY.

FORMAT B:/1

will therefore produce a 180K single-sided disk in the B: drive (half the normal two-sided 360K).

FORMAT B:/S/1

will produce a bootable disk with about 100K storage left in the B: drive. The /S suffix copies the "system" files, two hidden files and COMMAND.COM to the disk in addition to formatting it, so the disk has less space for storage, but will boot.

Note also that if you want the disk to EVER be bootable, you should format it with the /S suffix...

Also, the version number of the COMMAND.COM on the disk should be the same version as the two hidden files. Formatting a disk under DOS 2.1 (using the /S suffix to place the hidden files onto the disk) and then copying a later COMMAND.COM file to the disk will probably produce error statements and a refusal to boot. This happens most often when someone copies all of the files from a later application to a disk formatted under an earlier DOS, using the COPY *.* command. This will ALSO copy the later COMMAND.COM, and the resulting disk will have a major identity crisis...

Elmer Meissner

{?} I have a copy of Superprint by Scholastic on 3.5 inch disk. I have been unable to make a backup. The disk copies without errors, but when booted it loads ProDOS, fills the screen with @ signs and then reboots the computer.

The mention in Computist #65 refers to the 5 1/4 inch disk version. There is no SPSTRT.SYSTEM file on the 3.5 disk. There are only two system files in the catalog, ProDOS and SP.SYSTEM. All other files are BIN type.

I would be grateful for any help in backing up this disk.

George Sabeh

Softkey for...

Space Quest II

Sierra On-Line:

Requirements:

Fast copy program or Copya
Sector Editor

4 double sided disks or 8 single sided disks

Sierra continues to use their usual copy protection:

1. Copy all sides using Copya or fast copy program.
2. Sector edit Boot side and change the following:

Trk	Sct	Byte	From	To
\$0C	\$00	\$2B	C9 C9 D0 0D	29 00 D0 0D
\$19	\$00	\$2B	C9 C9 D0 0D	29 00 D0 0D

Remember to write it back to disk.

Softkey Addendum for...

Leisure Suit Larry

Sierra

The following is an addition to another Softkey. In a previous Softkey for Leisure Suit Larry there is at least one sector edit missing. While playing the game and completing part of it, if you enter the taxi the program will hang and the taxi will not take you anywhere. I found the following sector edit corrected this. There could be further checks later in the game since I have not

completed it. The sector edit needed is to track \$17, sector \$00, byte \$2B, from C9 C9 to 29 00. If needed you may search your disk for C9 C9 D0 0D and change the C9 C9. I found this check in only one place.

{?} I would like to see one of your experts tackle Electronic Art's new protection scheme. They have been using this on all their new releases such as Deathlord, Wasteland, Chuck Yeager Flight Simulator etc.. A Softkey was published for Deathlord but I have not seen any of the other programs unprotected. Please add Chuck Yeager to your most wanted list.

Dr. Hackenbush

Wizardry V - Bug, or Feature?

I just received COMPUTIST #65 today and especially enjoyed the review of Wizardry #V. I have been relatively obsessed with this game for the last couple of months, ever since buying it, and echo all the high praise given to it in the review.

The only negative aspect of the game is the numerous disks involved, all of which have to be copied; also the swapping of disks that occurs whenever you change levels. The reason for this by the way is that the program is written in Apple Pascal. As far as I know there has never been a version of this language that permitted booting from any slot other than slot 6, nor has there been a version that allowed anything other than 5 1/4 inch disks.

I might mention that when I made the required copies of the disks before starting to play, an error appeared in my copy, resulting in my spending about two weeks carefully mapping a level of the maze that doesn't actually exist! I discovered this after getting trapped in an area of maze that had no exit and thus losing my party. Fortunately I had made a back up of my character disk so no permanent harm was done. When I began to suspect the source of the problem I used the "verify disk" utility on Copy II+, and realized that I had a bad copy. A new copy solved the problem. I highly recommend that you verify all of the disks before starting to play. If the maze suddenly seems to change, check the disk again.

The "Orientation Bug"

Since the review mentions the so-called "orientation bug", I thought I might help out by giving the explanation as I understand it. You may not get an explanation of this from Sir-Tech, since they may feel that enjoyment of the game is enhanced by this frustrating little quirk that was programmed in intentionally. I too found that characters would change orientation from good to evil or vice versa, in a seemingly haphazard manner. This switching of orientation however is a planned feature of the program.

As you explore the maze you will occasionally be offered the option of accepting an encounter, or declining to fight and leaving the monsters to go in peace. If your party is good you must decline these encounters. If your party is evil you must accept them. The program keeps a record of your party's decisions. If the ratio of accepted to declined is wrong for your party's orientation, that is, if a "good" party has been too belligerent, or an "evil" party too pacific, then when you get back to the castle, one of the party members is selected (by some random process as far as I know) to change orientation. Since I discovered this secret I have no longer been troubled by orientation changes. I got my insight into this aspect of the game by reading the transcript of a conference with D. Bradley, who should know, among the library files on Compuserve.

Advanced Playing Technique for...

Wizardry V

Sir-Tech Software

I found a way of getting as many gold pieces as you want while playing the game: It seemed rather obvious to me at the time, but just in case somebody needs help on this I thought I'd pass it on. When your characters accumulate a fair number of gold pieces, or when they have found some particularly valuable object that they can sell to Boltac, such as a sword of fire, make an extra copy of your character disk. Use the utility program to change the character's name, then transfer the renamed character to your original disk. You will then have cloned your original character with all his possessions.

I have used this method to clone my best fighter, with his armor, etc., to get an unlimited supply of gold and an unlimited supply of otherwise scarce items. Since certain items, such as the Sword of Fire, the bottle of rum, etc. can only be found in the maze, it's a good idea to make clones of the characters holding them as well. This way you can save a little time in a game that does seem to go on forever anyway. I hope the above information is useful to others who are playing the game.

{?} I have a problem, in that I can't find something called "the kettle", which I believe is supposed to be behind a secret door in the northeast corner of level one. If anyone can give me a hint, or even the coordinates of this object, I'd greatly appreciate it. There are other things that confuse me, even though I've explored a good portion of level six already, but so far this is the only thing that I feel has definitely stumped me.

Perry L. Holman

Wrath Mapper Bug

The "Wrath Mapper" program I submitted (the April issue) has an unnecessary line in the "Chart" program. Please delete line zero; it won't hurt but it doesn't do anything relevant. Also, the program returned from COMPUTIST on disk had been infested with "tilde characters". I don't know if it's part of the conversion process but tildes were mixed in with the MAXFILES and some of the PRINT statements. For those of you who also receive the magazine on disk, my apologies. If you take out the tildes, the program will work fine.

Hopefully the editor will include the updated WRATH programs I've included on the next disk, they work better and use the OVERLAY files to show the initial position of monsters and NPCs.

MAPMAGIC

Mapping Program for Might & Magic I

First of all I apologize for the amount of machine language (ML) routines required to make this program work. I originally tried writing it all in Applesoft but it was extremely slow and trying to debug it was giving me a migraine. The program consists of the BASIC program MAPMAGIC and four binary files: DOSUTIL (Thanks to Tom Weishaar, DOSTalk Scrapbook); MAPUTIL (composed of routines to rearrange the data loaded from disk, output sector data in HEX format, and to zero out memory pages to avoid confusion with shape offset buffers); MAGIC2 (with routines to printout both movement and special bytes for a single sector or for the entire land of Varn, and a routine to convert map data in shape equivalents); and MSHAPES (the shapes used in the HIRES display).

The map data for Might & Magic is stored in a format that makes it very difficult to extract and print in recognizable form. A map file is stored on at least five disk sectors, the first two of which are the "appearance sector" (the data bytes control how your position is displayed on the graphics screen, i.e. forest, mountains, swamp, etc) and the "movement sector" which controls the directions a player is allowed to move. The "appearance sector" was too difficult to translate without using over 60 shapes and User Defined Characters (UDC) so I elected to use the "movement sector" for this program. The remaining three sectors have information relating to the messages you receive on a particular square, problems to solve, NPCs and map sector information.

The "movement sector" contains bit-mapped information that determines the possible direction of movement and any guaranteed encounter or special squares. The possibilities depend on the status of each byte bit:

Bit 0- (if set) indicates a barrier exists to the west

Bit 1- Unknown

Bit 2- (if set) indicates a barrier to the south

Bit 3- (if set) indicates a special effect such as desert, heat or water

Bit 4- (if set) indicates a barrier to the east

Bit 5- Unknown

Bit 6- (if set) indicates a barrier to the north

Bit 7- (if set) indicates something special; an encounter, NPC, etc.

The map data is stored on each sector in reverse row order (making the number of basic negative, stepped loops required unmanageable) so the ML Routines translate this data into separate memory pages for each sector. The first memory page contains purely barrier data and the second, special effect or square data.

The BASIC program is heavily commented but I would add that the printer commands in lines 1000-1900 should be carefully checked to make sure they are compatible with your printer. The program will work without modification on Epson JX or FX printers.

Although I'm sure there won't be magazine space to print them I've also forwarded commented source code for all the ML routines (Merlin 8/16 was used) for those who might be interested in seeing how the program works.

The program is designed to work with Disk C (The outdoors disk in M&M) but will also work with the other disks; simply change the options in lines 100-155 and the track/sector array in lines 5200-5210. I would have included them but again, magazine space was a consideration. It would have doubled the size of the basic program.

Here are the addresses to use when saving the binary files:
BSAVE DOSUTIL,A\$300,L\$0038 (or BSAVE DOSUTIL,A768,L56)
BSAVE MAPUTIL,A\$33C,L\$007F (or BSAVE MAPUTIL,A828,L127)
BSAVE MAGIC2,A\$4F00,L\$0125 (or BSAVE MAGIC2,A20224,L293)
BSAVE MSHAPES,A\$5200,L\$0117 (or BSAVE MSHAPES, A20992, L279)

Please be sure to save the Applesoft program as "MAPMAGIC".

You'll also notice that one of the main menu options is Map Utility. This calls an ML routine that dumps (to screen and/or printer) one sector in Hexadecimal format organized into rows

(Bytes per row is necessary), it prints this information forward or reverse. I've been using this utility for some time. It's much easier than dumping a sector with Copy II+ and trying to organize it to see if it IS map data.

```

10 REM *****
15 REM * MAGIC MAPPER *
20 REM * BY PERRY L. HOLMAN *
25 REM *****
30 LOMEM: 22272
35 ONERR GOTO 50
40 GOTO 4900
50 REM ERROR TRAP
55 PRINT : PRINT CHR$(4); "PR#0"
60 HOME : VTAB 5: PRINT TAB(10)
  "AnErrorHasOccurred!"
70 PRINT : PRINT TAB(10)
  "TheErrorCodeWas:"; PEEK(222)
75 ER = PEEK(218) + (PEEK(219) * 256)
80 PRINT : PRINT TAB(10) "OnLineNumber:"
  ;ER: END
100 REM GET MAP SECTOR
105 HOME : VTAB(5): HTAB(12): INVERSE :
  PRINT "SELECTMAPSECTOR": NORMAL: VTAB
  (8)
110 PRINT "<A>A1000<F>B2000<K>C3000<P>D4"
  : PRINT
115 PRINT "<B>A2000<G>B3000<L>C4000<Q>E1"
  : PRINT
120 PRINT "<C>A3000<H>B4000<M>D1000<R>E2"
  : PRINT
125 PRINT "<D>A4000<I>C1000<N>D2000<S>E3"
  : PRINT
130 PRINT "<E>B1000<J>C2000<O>D3000<T>E4"
  : PRINT
135 VTAB(20): PRINT TAB(3)
  "PressTheLetter(UppercaseOnly)"
140 PRINT TAB(3)
  "forTheSectorYouWishToMap:"; GET
  MS$
145 MS = ASC(MS$) - 64: IF MS < 1 OR MS > 20
  THEN GOTO 105
150 POKE 784, TK(MS): POKE 789, SC(MS): CALL
  768
155 HOME : RETURN
200 REM MORE TO DO?
205 HOME : VTAB 10: PRINT TAB(8)
  "MoreToDo?(Y/N):"; GET MO$
210 HOME : RETURN
300 REM ONE MOMENT PLEASE
305 HOME : VTAB 10: PRINT TAB(8)
  "OneMomentPlease..."
310 RETURN
400 REM PRINTING
405 HOME : VTAB 10: PRINT TAB(14)
  "Printing..."
410 RETURN
1100 REM DEFINE CHARACTERS
1105 GOSUB 1500: REM PRINTER ON
1110 PRINT CHR$(27); ":"; CHR$(0); CHR$(
  0); CHR$(0); REM COPY ROM TO RAM
1115 PRINT CHR$(27); "&"; CHR$(0); CHR$(
  101); CHR$(118);
1120 FOR L1 = 1 TO 18: PRINT CHR$(10);
1125 FOR L2 = 1 TO 11: READ CH: PRINT CHR$(
  CH);
1130 NEXT L2: NEXT L1
1135 GOSUB 1600: REM PRINTER OFF
1140 DC = 1: REM ONLY DEFINE CHARS ONCE
1145 RETURN
1200 REM PRINT HOW MUCH?
1205 HOME : VTAB 6: PRINT TAB(8)
  "ShouldIPrint..."
1210 VTAB 10: PRINT TAB(8)
  "<1>SelectedSectorOnly"
1215 VTAB 13: PRINT TAB(8)
  "<2>TheEntireMap"
1220 VTAB 17: PRINT TAB(8) "YourChoice(1/
  2):"; GET HM
1225 IF HM < 1 OR HM > 2 THEN GOTO 1205
1230 RETURN
1300 REM ACTIVATE RAM CHARACTERS
1305 PRINT CHR$(27); "%"; CHR$(1); CHR$(
  0); REM ACTIVATE RAM CHARS
1310 PRINT CHR$(27); "1"; REM 7 DOT LINE
  SPACING
1315 RETURN
1400 REM DEACTIVATE RAM CHARACTERS
1405 RETURN
1410 PRINT CHR$(27); "%"; CHR$(0); CHR$(
  0); REM ACTIVATE ROM CHARS
1500 REM PRINTER ON
1505 PRINT D$; "PR#1"
1510 PRINT CHR$(9); "ON"

```

```

1515 RETURN
1600 REM PRINTER OFF
1605 PRINT D$; "PR#0"
1610 RETURN
1700 REM PRINT ONE SECTOR
1705 GOSUB 100: REM GET MAP SECTOR
1710 GOSUB 400: REM PRINTING
1715 POKE 841, 65: CALL 828: POKE 20225, 65:
  CALL 20224
1720 GOSUB 1500: REM PRINTER ON
1725 GOSUB 1300: REM ACTIVATE RAM
1730 CALL 20308
1735 GOSUB 1400: GOSUB 1600
1740 RETURN
1800 REM PRINT ENTIRE MAP
1805 GOSUB 400: REM PRINTING
1810 GOSUB 1500: REM PRINTER ON
1815 GOSUB 1300: REM ACTIVATE RAM AND 7 DOT
  LINE SPACING
1820 X = 1
1825 FOR L = 1 TO 4: DB = 69: SB = 70
1830 FOR MS = X TO 20 STEP 4
1835 POKE 784, TK(MS): POKE 789, SC(MS): CALL
  768
1840 POKE 841, DB: CALL 828: POKE 20225, DB:
  POKE 20229, SB: CALL 20224
1845 POKE 20278, DB: POKE 20282, 68: POKE
  20300, DB: CALL 20277
1850 DB = DB + 2: SB = SB + 2: NEXT MS
1855 CALL 20398: X = X + 1: NEXT L
1860 GOSUB 1400: GOSUB 1600: REM PRINTER OFF
  AND NORMAL
1865 RETURN
1900 REM UDC PRINT MAIN DRIVER
1905 IF DC = 1 THEN GOTO 1920
1910 GOSUB 300: REM ONE MOMENT
1915 GOSUB 1100: REM DEFINE CHARACTERS
1920 GOSUB 1200: REM 1 SECT OR ENTIRE MAP
1925 ON HM GOSUB 1700, 1800
1930 GOSUB 200: REM MORE TO DO?
1935 IF MO$ = "Y" OR MO$ = "y" THEN GOTO 1920
1940 GOTO 4920: REM BACK TO MAIN MENU
2100 REM DRAW 256 SHAPES
2105 ROT= 0: SCALE= 1: HCOLOR= 3
2110 HP = 40: VP = 15
2115 C = 0: FOR L1 = 1 TO 16
2120 FOR L2 = 1 TO 16
2125 SH = PEEK(NS + C): IF SH = 0 THEN SH =
  1
2130 DRAW SH AT HP, VP
2135 HP = HP + 10: C = C + 1: NEXT L2
2140 HP = 40: VP = VP + 9: NEXT L1
2145 RETURN
2200 REM SHAPE SETUP
2205 HGR: NS = 20736: GOSUB 2100
2210 NS = 16896: GOSUB 2100
2215 RETURN
2300 REM SAVE PICTURE?
2305 VTAB 22: PRINT
  "Press<S>ToSaveThisScreen"
2310 PRINT "AnyOtherKeyExitsToMainMenu!"
  ; GET S$
2315 IF S$ = "S" OR S$ = "s" THEN GOTO 2325
2320 GOTO 2330
2325 PRINT D$; "BSAVE&M&PIC, A$2000, L$2000, D1"
2330 RETURN
2900 REM HIRES SHAPE MAIN DRIVER
2905 GOSUB 100: REM GET MAP SECTOR
2910 POKE 841, 65: CALL 828
2915 POKE 20225, 65: POKE 20229, 66: CALL 20224
2920 POKE 20278, 65: POKE 20282, 67: POKE
  20300, 81: CALL 20277
2925 GOSUB 2200: REM SHAPE SETUP
2930 GOSUB 2300: REM SAVE PICTURE
2935 TEXT : HOME : GOTO 4920
3100 REM GET MAP/DOS INFO
3105 HOME : VTAB 5: PRINT TAB(10) "Track?"
  ; GET TR
3110 IF TR < 0 OR TR > 34 THEN GOTO 3105
3115 PRINT : PRINT TAB(10) "Sector?"; GET
  SC
3120 IF SC < 0 OR SC > 15 THEN GOTO 3115
3125 PRINT : PRINT TAB(10) "Drive?"; GET
  DR
3130 IF DR < 1 OR DR > 2 THEN GOTO 3125
3135 PRINT : PRINT TAB(10) "Direction?(F/
  B):"; GET DI$
3140 IF DI$ = "F" OR DI$ = "f" THEN DI = 1
3145 PRINT : HTAB(100): INPUT
  "BytesPerRow?"; MR
3150 IF MR > 20 THEN PRINT D$; "PR#3"
3155 HOME : GOSUB 300: REM ONE MOMENT PLEASE
3160 POKE 779, DR: POKE 784, TK: POKE 789, SC:

```

```

POKE 907, MR: CALL 768
3165 RETURN
3200 REM OUTPUT TO PRINTER?
3205 HOME : VTAB 5
3210 PRINT TAB(5) "DumpToPrinterAlso?(Y/
  N):"; GET A$
3215 IF A$ = "Y" OR A$ = "y" THEN A = 1
3220 RETURN
3900 REM MAPUTILITY MAIN DRIVER
3905 GOSUB 3100: REM GET DOS INFO
3910 GOSUB 3200: REM OUTPUT TO PRINTER?
3915 HOME : IF A = 1 THEN PRINT D$; "PR#1"
3920 IF DI = 1 THEN POKE 8, 64: CALL 904: GOTO
  3930
3925 CALL 828: POKE 8, 65: CALL 904
3930 IF A = 1 THEN PRINT D$; "PR#0"
3935 GOSUB 200: REM MORE TO DO
3940 IF MO$ = "Y" OR MO$ = "y" THEN GOTO 3905
3945 POKE 8, 64: REM PUT BACK TO DEFAULT
3950 GOTO 4920: REM BACK TO MAIN MENU
4100 REM MAIN MENU OPTIONS
4105 HOME
4110 VTAB(4): HTAB(15): INVERSE : PRINT
  "MAINMENU": NORMAL
4115 VTAB(8): PRINT TAB(11)
  "1)UDCtoPrinter"
4120 VTAB(10): PRINT TAB(11)
  "2)HIRESDisplay"
4125 VTAB(12): PRINT TAB(11)
  "3)MapUtility"
4130 VTAB(14): PRINT TAB(11)
  "4)ExittoBasic"
4135 VTAB(18): PRINT TAB(9) "YourChoice(1-
  4):"; GET M
4140 IF M < 1 OR M > 4 THEN GOTO 4005
4145 RETURN
4700 REM VARIABLES/DIMENSIONS/FUNCTIONS
4705 D$ = CHR$(13) + CHR$(4)
4710 DIM CH(20): DIM TK(20): DIM SC(20): DIM
  MS(20)
4715 RETURN
4800 REM MAIN SETUP
4805 PRINT D$; "BLOAD&DOSUTIL, A$300"
4810 PRINT D$; "BLOAD&MAPUTIL, A$33C"
4815 PRINT D$; "BLOAD&MAGIC2, A$4F00"
4820 PRINT D$; "BLOAD&MSHAPES, A$5200"
4825 CALL 932: POKE 939, 68: CALL 932
4830 FOR L = 1 TO 36: READ A, S: POKE A, S:
  NEXT L
4835 FOR L = 1 TO 20: READ TK(L), SC(L): NEXT
  L
4840 POKE 232, 0: POKE 233, 82
4845 DC = 0: REM ONLY DEFINE CHARS ONCE
4850 RETURN
4900 REM Main Driver
4905 GOSUB 300: REM ONE MOMENT PLEASE
4910 RESTORE : GOSUB 4700: REM VARIABLES
4915 GOSUB 4800: REM SETUP
4920 GOSUB 4100: REM MAIN MENU
4930 ON M GOTO 1900, 2900, 3900, 4940
4935 GOTO 4920
4940 TEXT : HOME : END
5000 REM SHAPE OFFSETS
5005 DATA
  17152, 1, 17153, 2, 17156, 3, 17157, 4, 17168, 5
5010 DATA
  17169, 6, 17172, 7, 17173, 8, 17216, 9, 17217, 10
5015 DATA
  17220, 11, 17221, 12, 17232, 13, 17233, 14, 17236, 15
5020 DATA 17237, 16, 17280, 18, 17288, 17
5100 REM UDC OFFSETS
5105 DATA
  17408, 101, 17409, 102, 17412, 103, 17413, 104, 17424, 105
5110 DATA
  17425, 106, 17428, 107, 17429, 108, 17472, 109, 17473, 110
5115 DATA
  17476, 111, 17477, 112, 17488, 113, 17489, 114, 17492, 115
5120 DATA 17493, 116, 17536, 118, 17544, 117
5200 REM MAP SECTOR DATA(TK, SC)
5205 DATA
  1, 7, 1, 13, 2, 3, 2, 9, 0, 2, 2, 15, 0, 9, 3, 5, 3, 11, 17, 2, 4, 1, 4, 7
5210 DATA
  4, 15, 5, 3, 5, 9, 1, 0, 17, 9, 5, 15, 26, 3, 26, 9
5300 REM CHARACTER DEFINITION DATA
5305 DATA 0, 0, 0, 0, 0, 0, 0, 0, 0, 0: REM SHAPE1
5310 DATA 127, 0, 0, 0, 0, 0, 0, 0, 0, 0: REM SHAPE2
5315 DATA 1, 0, 1, 0, 1, 0, 1, 0, 1, 0: REM SHAPE3
5320 DATA 127, 0, 1, 0, 1, 0, 1, 0, 1, 0: REM SHAPE4
5325 DATA 0, 0, 0, 0, 0, 0, 0, 0, 0, 127: REM SHAPE5
5330 DATA 127, 0, 0, 0, 0, 0, 0, 0, 0, 127: REM
  SHAPE6
5335 DATA 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 127: REM SHAPE7
5340 DATA 127, 0, 1, 0, 1, 0, 1, 0, 1, 0, 127: REM

```

SHAPE8
5345 DATA 64,0,64,0,64,0,64,0,64,0,64: REM
SHAPE9
5350 DATA 127,0,64,0,64,0,64,0,64,0,64: REM
SHAPE10
5355 DATA 65,0,65,0,65,0,65,0,65,0,65: REM
SHAPE11
5360 DATA 127,0,65,0,65,0,65,0,65,0,65: REM
SHAPE12
5365 DATA 64,0,64,0,64,0,64,0,64,0,127: REM
SHAPE13
5370 DATA 127,0,64,0,64,0,64,0,64,0,127: REM
SHAPE14
5375 DATA 65,0,65,0,65,0,65,0,65,0,127: REM
SHAPE15
5380 DATA 127,0,65,0,65,0,65,0,65,0,127: REM
SHAPE16
5385 DATA 0,0,0,28,0,20,0,28,0,0,0: REM
SHAPE17
5390 DATA 0,8,34,0,20,8,20,0,34,8,0: REM
SHAPE18

1725-\$C2F5 3220-\$836D 5390-\$F1C6
1730-\$92A4 3900-\$9AE5 5385-\$3775
1735-\$77C6 3905-\$8A3F 5390-\$F8CE
1740-\$E887 3910-\$5041

DOSUTIL, A\$300, L\$0038

0300: A9 00 8D EB B7 A9 60 8D \$98FF
0308: E9 B7 A9 02 8D EA B7 A9 \$EBC8
0310: 02 8D EC B7 A9 03 8D ED \$3E36
0318: B7 A9 01 8D F4 B7 A9 00 \$365E
0320: 8D F0 B7 A9 40 8D F1 B7 \$7CEE
0328: A9 B7 A0 E8 4C D9 03 90 \$ED37
0330: 06 AD F5 B7 8D 38 03 60 \$5557

MAPUTIL, A\$33C, L\$007F

033C: A9 00 85 06 \$16CC
0340: A9 40 85 07 A9 00 85 08 \$DDBF
0348: A9 41 85 09 A9 F0 8D 39 \$BC7D
0350: 03 8D 3B 03 A9 00 8D 3A \$CE1F
0358: 03 38 4C 68 03 AD 39 03 \$1433
0360: E9 10 8D 39 03 8D 3B 03 \$098C
0368: A2 10 AC 3B 03 B1 06 AC \$9A7E
0370: 3A 03 91 08 C8 F0 10 8C \$54D2
0378: 3A 03 AC 3B 03 C8 8C 3B \$2934
0380: 03 CA F0 D9 4C 6A 03 60 \$0C56

MAGIC2, A\$4F00, L\$0125

4F00: A9 41 85 07 A9 42 85 09 \$F34B
4F08: A0 00 B1 06 29 88 C9 88 \$1D5D
4F10: F0 14 C9 80 F0 17 A9 00 \$3036
4F18: 91 08 B1 06 29 55 91 06 \$D1EE
4F20: C8 F0 11 4C 0A 4F A9 11 \$E81D
4F28: 91 08 4C 1A 4F A9 12 91 \$069C
4F30: 08 4C 1A 4F 60 A9 41 85 \$F666
4F38: 07 A9 43 85 09 A0 00 B1 \$DB19
4F40: 06 8C CF 03 A8 B1 08 AC \$238D
4F48: CF 03 99 00 51 C8 F0 03 \$C072
4F50: 4C 3F 4F 60 A9 44 85 09 \$1F1A
4F58: A9 41 85 07 20 3D 4F A9 \$ECF0
4F60: 42 85 07 A0 00 A2 10 B9 \$648A
4F68: 00 51 8E CD 03 8C CF 03 \$4C45
4F70: 09 80 20 ED FD AE CD 03 \$C890
4F78: AC CF 03 B1 06 C9 00 F0 \$1374
4F80: 17 A9 08 09 80 20 ED FD \$0144
4F88: AC CF 03 AE CD 03 B1 06 \$ACBD
4F90: 18 69 64 09 80 20 ED FD \$EFC0
4F98: AC CF 03 AE CD 03 C8 F0 \$1A7B
4FA0: 0C CA F0 03 4C 67 4F 20 \$C901
4FA8: 8E FD 4C 65 4F 60 A9 00 \$8D57
4FB0: 8D CC 03 A9 00 85 06 85 \$6AC7
4FB8: 08 A9 45 85 07 A9 46 85 \$162D
4FC0: 09 AC CC 03 A2 10 B1 06 \$7A59
4FC8: 8C CF 03 8E CD 03 09 80 \$BD1B
4FD0: 20 ED FD AC CF 03 AE CD \$F4EA
4FD8: 03 B1 08 C9 00 F0 17 A9 \$610E
4FE0: 08 09 80 20 ED FD AC CF \$B6A2
4FE8: 03 AE CD 03 B1 08 18 69 \$51CD
4FF0: 64 09 80 20 ED FD AC CF \$D091
4FF8: 03 C8 AE CD 03 CA F0 03 \$D1E1
5000: 4C C6 4F E6 07 E6 07 E6 \$3040
5008: 09 E6 09 A5 09 C9 50 F0 \$E2C6
5010: 03 4C C1 4F 18 AD CC 03 \$DE86
5018: 69 10 C9 00 F0 06 8D CC \$DCC6
5020: 03 4C B3 4F 60 \$7BB1

MSHAPES, A\$5200, L\$0117

6100: 12 00 26 00 28 00 31 00 \$C466
6108: 37 00 41 00 47 00 54 00 \$784B
6110: 61 00 77 00 85 00 92 00 \$AE5E
6118: A4 00 B2 00 BC 00 CA 00 \$8226
6120: DB 00 EC 00 F4 00 C1 00 \$192A
6128: DB DB 1B 24 24 24 04 \$0ABD
6130: 00 3F 3F 3F 3F 07 00 3F \$049F
6138: 3F 3F 3F 24 24 24 04 \$672E
6140: 00 24 24 24 24 04 00 24 \$4FEA
6148: 24 24 24 DF DB 1B 36 36 \$79CC
6150: 36 36 06 00 DB DB 1B 2D \$CBBA
6158: 2D 2D 2D 24 24 24 04 \$98F0
6160: 00 C1 C1 C1 C1 C1 C1 \$10C9
6168: C1 36 36 36 36 3F 3F 3F \$A92B

6170: 3F 24 24 24 24 04 00 C1 \$285C
6178: C1 C1 C1 C1 C1 C1 3F \$4D0B
6180: 3F 3F 3F 07 00 DB DB 1B \$F0D6
6188: 24 24 24 24 2D 2D 2D 2D \$6658
6190: 05 00 3F 3F 3F 3F 04 C1 \$CF21
6198: C1 C1 C1 C1 C1 C1 2D 2D \$D503
61A0: 2D 2D 05 00 3F 3F 3F 3F \$DA1B
61A8: 24 24 24 24 2D 2D 2D 2D \$EC05
61B0: 05 00 24 24 24 24 3F 3F \$ECB0
61B8: 3F 3F 07 00 24 24 24 24 \$17E3
61C0: 3F 3F 3F 3F 36 36 36 36 \$C19D
61C8: 06 00 DB DB 1B 2D 2D 2D \$6779
61D0: 2D 24 24 24 24 3F 3F 3F \$2E05
61D8: 3F 07 00 24 24 24 24 3F \$5B9E
61E0: 3F 3F 3F 36 36 36 36 2D \$4B21
61E8: 2D 2D 2D 00 1B C1 C1 24 \$6AD1
61F0: 3F 36 2D 00 C1 23 C1 C1 \$7731
61F8: C1 C1 C1 17 96 3A C1 04 \$0E4A
6200: C1 17 37 36 C1 C1 C1 C1 \$8EA0
6208: E4 92 1C 16 17 04 C1 C1 \$0884
6210: C1 07 C1 96 92 05 00 \$86E9

DOS UTILITY

ORG \$300
RWTS EQU \$3D9
EDOS EQU \$B7F5
ER EQU \$338
DUTIL LDA #00 ;Vol 00 (Wildcard)
STA \$B7EB ;Slot # * 16 (Slot 6 Used)
LDA #60
STA \$B7E9
LDA #02 ;Drive #
STA \$B7EA
LDA #02 ;Track #
STA \$B7EC
LDA #03 ;Sector #
STA \$B7ED
LDA #01 ;Command Code (1=Read/2=Write)
STA \$B7F4
LDA #00 ;Low Byte of Data Buffer
STA \$B7F0
LDA #40 ;High Byte of Data Buffer
STA \$B7F1
LDA #B7 ;High Byte of DOS IOB Table
LDY #E8 ;Low Byte of DOS IOB Table
JMP RWTS ;Jump to DOS RWTS Vector
BCC DONE ;If no error, we're through
LDA EDOS ;Get DOS Error Code (later use)
STA ER ;Store it in \$06
DONE RTS

MAP UTILITY

* General Use Map Utility *
* By Perry L. Holman *
* April 2, 1989 *
ORG \$33C
CROUT EQU \$FD8E
PRBYTE EQU \$FDDA
BUFF EQU \$4000
DB EQU \$06
RB EQU \$08
C1 EQU \$339
C2 EQU \$33A
C3 EQU \$33B
REAR LDA #00 ;Setup Zero Page Pointer for
STA DB ;Data Buffer
LDA #40
STA DB+1
LDA #00 ;Setup Zero Page Pointer for
STA RB ;Offset Buffer
LDA #41
STA RB+1
LDA #F0 ;Setup initial pointer for 1st
STA C1 ;Map Row
STA C3 ;Store it here to increment
LDA #00 ;Initial value for 256 Byte
STA C2 ;Counter
SEC ;First subtraction coming up
JMP LOOP2
LOOP1 LDA C1 ;Load pointer value
SBC #10 ;Subtract MR
STA C1 ;Put it back
STA C3 ;and here too
LOOP2 LDX #10 ;Get ready for a row
LSXTN LDY C3 ;and indirect ZPage addressing
LDA (DB),Y ;Get a byte of raw data
LDY C2 ;Get Y Reg pointer for 1st Row
STA (RB),Y ;and put it in proper order
INY ;increment the Byte Counter
BEQ DONE1 ;Quit if rollover (256 Finished)

Checksums

10-\$BADD 1800-\$448C 3915-\$2FA1
15-\$F628 1805-\$FCF5 3920-\$80E7
20-\$DA85 1810-\$E4C8 3925-\$8A83
25-\$965F 1815-\$0ACD 3930-\$9C63
30-\$4B7D 1820-\$8F75 3935-\$BBD1
35-\$DD03 1825-\$E3AD 3940-\$BB77
40-\$13B0 1830-\$DEA7 3945-\$F28F
50-\$929B 1835-\$9C0F 3950-\$1260
55-\$E4D4 1840-\$202E 4100-\$FA59
60-\$BF00 1845-\$4913 4105-\$77ED
70-\$A393 1850-\$A144 4110-\$85B1
75-\$AD73 1855-\$FC59 4115-\$82C9
80-\$6619 1860-\$0219 4120-\$6C97
100-\$6FEF 1865-\$F4D1 4125-\$AB33
105-\$7D60 1900-\$3AB6 4130-\$FD26
110-\$B4A3 1905-\$48E0 4135-\$E463
115-\$3849 1910-\$6EBF 4140-\$7927
120-\$42C3 1915-\$1724 4145-\$2FE1
125-\$A9F4 1920-\$127D 4700-\$F20C
130-\$62C9 1925-\$46BB 4705-\$D471
135-\$EE31 1930-\$8B9C 4710-\$DA9F
140-\$32BB 1935-\$FB37 4715-\$0225
145-\$01B1 1940-\$0654 4800-\$3E6B
150-\$3041 2100-\$4215 4805-\$98A1
155-\$9F5E 2105-\$ACFD 4810-\$101D
200-\$4C72 2110-\$056D 4815-\$D198
205-\$BCF1 2115-\$681F 4820-\$F5AC
210-\$AA5E 2120-\$8AB3 4825-\$9FC8
300-\$7628 2125-\$E26E 4830-\$0A5C
305-\$2AEA 2130-\$5009 4835-\$27E1
310-\$7978 2135-\$94D1 4840-\$0587
400-\$A0DD 2140-\$9EA2 4845-\$255D
405-\$BC56 2145-\$FA00 4850-\$55DC
410-\$35C0 2200-\$16BF 4900-\$0929
1100-\$E002 2205-\$9FA9 4905-\$60DD
1105-\$F9B4 2210-\$DDF4 4910-\$07FD
1110-\$0FC2 2215-\$F40C 4915-\$F8F4
1115-\$27B5 2300-\$CA6B 4920-\$5972
1120-\$613A 2305-\$6B4C 4930-\$3C65
1125-\$4D79 2310-\$53F5 4935-\$3A8D
1130-\$91F1 2315-\$2EB4 4940-\$F6AA
1135-\$D127 2320-\$E276 5000-\$0FE4
1140-\$38D5 2325-\$4E86 5005-\$6096
1145-\$1FE0 2330-\$2112 5010-\$B19B
1200-\$E046 2900-\$A3D1 5015-\$06AB
1205-\$3299 2905-\$707C 5020-\$9D4E
1210-\$9D61 2910-\$30DF 5100-\$B311
1215-\$BB96 2915-\$B8CE 5105-\$CE19
1220-\$82D8 2920-\$5024 5110-\$6E3D
1225-\$713C 2925-\$94AB 5115-\$1542
1230-\$C76A 2930-\$9918 5120-\$56FB
1300-\$10F1 2935-\$73A9 5200-\$77BD
1305-\$263C 3100-\$490E 5205-\$090D
1310-\$E985 3105-\$7C88 5210-\$0B2E
1315-\$ED4D 3110-\$A309 5300-\$8E84
1400-\$4BD3 3115-\$C64B 5305-\$262D
1405-\$8B58 3120-\$630E 5310-\$581E
1410-\$405B 3125-\$ADFB 5315-\$B101
1500-\$FDFC 3130-\$F2D5 5320-\$6120
1505-\$93BB 3135-\$01A5 5325-\$CABE
1510-\$F32B 3140-\$A62C 5330-\$77C6
1515-\$0B97 3145-\$1583 5335-\$9C78
1600-\$2E76 3150-\$F7B2 5340-\$EA3A
1605-\$5987 3155-\$8B8B 5345-\$7F8E
1610-\$C5DC 3160-\$B3EA 5350-\$2855
1700-\$A9AC 3165-\$006B 5355-\$638C
1705-\$7355 3200-\$6B43 5360-\$D73A
1710-\$2B8F 3205-\$E6EA 5365-\$012A
1715-\$B2EF 3210-\$E60B 5370-\$E20E
1720-\$08F2 3215-\$CF54 5375-\$86C4

BUGs

COMPUTIST #67, page 11, softkey for "Nord and Bert couldn't make Heads or Tails of it". The hex dump for Reader and Writer was gargage. Here is the correct hex code:

```

READER
7F00: 2C 83 C0 2C 83 C0 2C 8B      $B316
7F08: C0 A9 01 85 E7 A9 60 85      $D68E
7F10: 00 85 01 A9 10 85 B3 A9      $5398
7F18: 65 8D 28 7F 20 1D D5 CE      $14D8
7F20: 28 7F 10 F8 2C 81 C0 60      $8A2B

WRITER
0F00: A9 00 8D EB B7 8D F0 B7      $5AE4
0F08: A9 10 8D F1 B7 A9 02 BD      $1DB3
0F10: F4 B7 A9 65 8D 81 0F 20      $8B4D
0F18: 3F 0F EE F1 B7 EE ED B7      $0BC7
0F20: AD ED B7 C9 10 D0 12 A9      $A4A3
0F28: 00 8D ED B7 EE EC B7 AD      $B196
0F30: EC B7 C9 23 D0 03 20 68      $CABC
0F38: 0F CE 81 0F 10 D9 60 AD      $5424
0F40: ED B7 48 A8 B9 58 0F 8D      $8F80
0F48: ED B7 A9 B7 A0 E8 20 00      $6DEE
0F50: BD B0 F7 68 8D ED B7 60      $54BE
0F58: 00 0D 0B 09 07 05 04 02      $C5E9
0F60: 0E 0C 0A 08 06 04 02 0F      $5A36
0F68: A9 C2 20 ED FD A9 00 8D      $01E5
0F70: EC B7 8D ED B7 2C 10 C0      $FC00
0F78: AD 00 C0 1D FB 2C 10 C0      $AA9C
0F80: 60          $A81A
    
```

COMPUTIST #67, pg. 17, softkey for Stellar 7, by Zak Egendorf. The softkey was not entered in the table of contents.

What kind of animal is it, anyway?

I have a complex question for all readers and I hope you can give me a simple answer. A "softkey" is a procedure that makes a protected disk copyable with COPYA. An "APT" is a change (edit) to a program (disk) that enhances playability. A "tip" is a technique for using existing commands or functions within a program to get enhanced functionality. So, here is my question. On disks that are COPYA-able but use a code wheel or other character entry/picture comparison protection, if a readers shows how to edit/patch the disk to bypass the protection, is it a softkey or an APT? How should I list it in RDEX and the table of contents?

Graphics, we got graphics!

We are using a Mac Ix (on loan from a local subscriber) and Pagemaker to layout the newsletter. Much of the lateness of this issue can be attributed to the changeover from the Compugraphic typesetter to the Mac page layout program. I'm still on the bottom of the learning curve and everything I do requires a trip to the reference manual. But, all that aside, having the Mac means that we can do Graphics almost as easily as text. So when you send a softkey, tip, APT or whatever, send some screen dumps (on disk of course) along too.

The graphics capability means that there are going to be some changes in the way that we set articles and in the way that headings and titles are done. 'Course, it won't happen overnight but it's going to happen. I need your help and suggestions on just what to do.

Instead of printing "Softkey for...", why not use a picture (icon). Something about 1/2 inch square or so. A picture of an open lock or a skeleton key or even a key in a lock. Of course, this applies to APTs, tips, bitkeys, questions and answers, etc. We could use a sword & shield for adventure tips, a closed lock for bitkeys, a yield sign for APTs, etc. Think about it and let me know what you come up with.

Send No Money!

The results of the "Send no money, Now" campaign (to date) are:

Invoiced	Paid	Declined	No response
36	19	6	11

Only about 2 dozen readers have requested the info flyer to hand out at local computer events. Of these, six readers have had info flyers returned with their names on them as the person who handed them out. 19 paid out of 36 responses is a 52% rate of return. Pretty good, considering the small number of readers who passed out flyers. What can I say to convince the rest of you to pass out a few flyers?

Sysop anyone?

We are in search of a good Sysop (System Operator). We've received a lot of good advice and suggestions on how to start a Bulletin Board System (BBS). According to everyone we've talked with, one of the most important parts is the Sysop. The Sysop should be knowledgable and willing to spend the time necessary to keep the board clean. This could involve up to 2 hours each day if the BBS becomes popular and I think it will. That's a lot of effort to ask from a volunteer but that's what we need. It will have to be someone local. The time factor would

```

STY C2      ;Store counter
LDY C3      ;Get first Y Reg from storage
INY         ;and increment it
STY C3      ;then store it
DEX         ;Decrement the row counter
BEQ LOOP1   ;if Row finished, go back
JMP LSXTN   ;or get another byte
DONE1      ;Quit
MUTIL      ;Get ready 256 Byte Sector)
LINE       ;Data Bytes Per Line
LOOP3      ;Start Getting Data
LDA (DB),Y ;Output hexadecimal Byte
JSR PRBYTE ;Countdown Line Length
DEX         ;Next Line if required
INY         ;Get Ready for Next Byte
BEQ DONE2  ;Yes, then Quit
JMP LOOP3   ;No, Go back for more
NLINE      ;Get Ready for Next Byte
INY         ;If All Done then Quit
BEQ DONE2  ;Go Back for Next Line
JMP LINE

DONE2      ;Make sure than buffer
ZERO       ;are exactly at beginning
LDA #00    ;of the pages
STA $08    ;Shape buff is default
LDA #43    ;ZPage pointer
STA $07    ;set to zero sh/udc buffer
LDY #00    ;zero
LOOPZ      ;put in buffer to zero
LDA #00    ;increment Y counter
STA ($06),Y
INY
BEQ DONE3  ;quit if rollover
JMP LOOPZ  ;go back if not
DONE3      ;return to caller
RTS
    
```

MAGIC MAPPER

* Might & Magic Map Utility *
 * By Perry L. Holman *
 * April, 1989 *

```

ORG $4F00
COUT EQU $FDED
CROUT EQU $FD8E
UDC EQU $4400
SHOFF EQU $4300
NEWSH EQU $5100
RB EQU $06
SB EQU $08
YKEEP EQU $3CF
TKEEP EQU $3CE
XKEEP EQU $3CD
CTR1 EQU $3CC
CONVERT LDA #41 ;Set ZPage Pointer
STA $07 ;for Rearranged Buff
LDA #42 ;and for the special
STA $09 ;bytes buffers
LDY #00 ;Setup for 256 Bytes
LOOP1 LDA (RB),Y ;Get Byte to Convert
AND #88 ;Check for Special Bits
CMP #88 ;Are both bits set?
BEQ SUB1 ;Yes, Go Put it Spec Buff
CMP #80 ;Just Bit ??
BEQ SUB2 ;Yes, Go Put it Spec Buff
LDA #00 ;No Special Bits, Put a
STA (SB),Y ;Zero in Special Buffer
LOOP2 LDA (RB),Y ;Get the Byte again and
AND #55 ;strip off all but walls
STA (RB),Y ;and put it back in RB
INY ;Increment counter
BEQ DONE1 ;Yes, then Quit
JMP LOOP1 ;No, go back for more
SUB1 LDA #11 ;Shape #17
STA (SB),Y ;Put the Byte in SB
JMP LOOP2 ;Go Back for Wall Byte
SUB2 LDA #12 ;Shape #18
STA (SB),Y ;Put the Byte in SB
JMP LOOP2 ;Go Back for Wall Byte
DONE1 RTS ;Return to Caller
SHAPE LDA #41 ;SB1 is default
STA $07 ;Zpage pointer
LDA #43 ;Shape Offset Buffer
STA $09 ;Zpage pointer
SHENT LDY #00 ;Set for 256 Bytes
LOOP3 LDA ($06),Y ;get first rearranged byte
STY YKEEP ;store Y counter for now
TAY ;byte to Y for shape offset
LDA ($08),Y ;get the right shape number
LDY YKEEP ;get back Y counter
STA NEWSH,Y ;put shape in shape buffer
INY ;increment Y counter
BEQ DONE2 ;quit if rollover
JMP LOOP3 ;go back if not
DONE2 RTS ;return to caller
    
```

```

PRUDC LDA #44 ;UDC offset buffer
STA $09 ;Zpage pointer
LDA #41 ;set pointer for converted1
STA $07 ;buffer
JSR SHENT ;gosub shape loader
LDA #42 ;set pointer for special
STA $07 ;byte buffer
LDY #00 ;256byte counter
LOOP4 LDX #10 ;map row counter
LOOP5 LDA NEWSH,Y ;get udc
STX XKEEP ;save X register
STY YKEEP ;and Y register
ORA #80 ;set hi bit for COUT
JSR COUT ;output it
LDX XKEEP ;get back X register
LDY YKEEP ;and Y register
LDA ($06),Y ;get a special byte
CMP #00 ;if its zero go on
BEQ DTNEW ;to next byte
LDA #08 ;otherwise send a BS
ORA #80 ;set high bit
JSR COUT ;output
LDY YKEEP ;get back both
LDX XKEEP ;registers and the
LDA ($06),Y ;special byte and
CLC ;get ready to add and
ADC #64 ;add 100 to shape number
ORA #80 ;to get correct UDC
JSR COUT ;COUT
DTNEW LDY YKEEP ;get back both
LDX XKEEP ;registers and
INY ;increment byte counter
BEQ DONE3 ;quit if rollover
DEX ;decrement rowbyte counter
BEQ NROW ;get another row
JMP LOOP5 ;or get another byte
NROW JSR CROUT ;send a carriage return
JMP LOOP4 ;and start another row
DONE3 RTS ;return to caller
PRALL LDA #00 ;Start counter value
STA CTR1 ;store it
RESET LDA #00 ;make sure pointers
STA $06 ;start on exact pages
STA $08 ;
LDA #45 ;first rearranged buffer
STA $07 ;Zpage Pointer
LDA #46 ;first special buffer
STA $09 ;Zpage Pointer
LOOP6 LDY CTR1 ;get current Y value
LDX #10 ;Map row value
LOOP7 LDA ($06),Y ;first byte
STY YKEEP ;store the X and Y
STX XKEEP ;registers
ORA #80 ;set High Bit for COUT
JSR COUT ;output character
LDY YKEEP ;get back X and Y
LDX XKEEP ;registers
LDA ($08),Y ;get a special byte
CMP #00 ;if its zero then go
BEQ NXBYT ;to the map byte
LDA #08 ;if it wasn't zero then
ORA #80 ;send a backspace to
JSR COUT ;COUT to output then
LDY YKEEP ;get the registers
LDX XKEEP ;and the byte back
LDA ($08),Y ;from the special buff
CLC ;add 100 for the correct
ADC #64 ;UDC value and
ORA #80 ;set the high bit for
JSR COUT ;COUT to output
LDY YKEEP ;get back Y register
INY ;increment it
LDX XKEEP ;and the X register to
DEX ;decrement it and go to
BEQ NBUFF ;next buff if row done
JMP LOOP7 ;or get another row byte
NBUFF INC $07 ;increment our Zpage
INC $07 ;pointers twice to skip
INC $09 ;to the next set of map
INC $09 ;and special buffers
LDA $09 ;see if we've finished
CMP #50 ;all five buffers yet
BEQ NROW2 ;yes- go to next row
JMP LOOP6 ;no get another buffer
NROW2 CLC ;get ready to add
LDA CTR1 ;load our counter
ADC #10 ;add 16 (Map row length)
CMP #00 ;see if we've finished
BEQ DONE4 ;yes then quit
STA CTR1 ;no store new counter
JMP RESET ;start all over again
DONE4 RTS ;return to caller
    
```

make long distance too expensive. It should probably be someone retired who has a lot of time. Do you know of anyone like that?

Back on schedule (Ha! Ha!, you say?)

Yeah, I know, it's getting real hard to tell if you've missed an issue or if we're just late again. But we may have a solution for you (and us). This issue will use up the last of the odd-sized paper that we bought. Starting with issue #69 we will go to the standard 11" x 17" paper size. That will give us 2 1/2 more inches of column space per page and allow us to change the number of pages in each issue. Each roll of paper on the web is 8 pages in the newsletter. So, when the print deadline comes up, I will cut off editing at the nearest 8 page increment (full roll) and send it off. Depending on the number of volunteers that show up each month, the issue could range from a low of 24 pages (at mid-summer) to a high of 48 or more pages (mid-winter). As you can see, our printing schedule is dependent on the weather. Bad weather brings out more volunteer help. During good weather our volunteers can be found at the beach or at Mt. Rainier.

Change of Address?

If you change your address, you must let us know in advance of our next mailing. Sometimes we find ourselves in the embarrassing situation where you say you sent a change of address notice but we never received one. So we've come up with a tentative solution. We will send an acknowledgement card whenever we receive a change of address notice. If you do not receive an acknowledgement card after 2 weeks then it's time to call us direct.

Lost Issue?

There were a lot more lost issues of COMPUTIST #67 than of any other issue to date. The losses were mostly in Illinois. Because the losses were grouped but not consecutive, I believe the problem is with our bulk mailer (Mail Media) and not with the US Postal System (USPS). I think that someone at Mail Media let the machine, that cuts and glues the labels on each issue, run a little low on glue. Anyway, we're sorry for any inconvenience or delay that you experienced. The customer service rep at Mail Media was apologetic. He even sounded sincere, for what that's worth.

Help Letters

Just a reminder to those of you who write for help. Send your letter on disk but enclose a written/printed copy. Help letters and answers to help letters are put into the very next issue. Regular submissions are printed in chronological order. We are running several months behind on our regular input. That's one of the reasons that we started using the tabloid format, to double the amount of material that we could print in each issue and to help us catch up.

Bobby

65C802 Addendum

In COMPUTIST #67 I talked about the 65C802 processor. I mentioned that Apple Computer could just plug it into their IIe and go, but you can't. The reason is that the interrupt vectors in native mode (16 bit mode) are not in the same place as in emulation (Apple II) mode. If you are serious about using the '802 then that poses only a minor problem. You just burn a new EF ROM with a few patches, a pain in the rectus but not impossible. The native mode vectors are moved down 16 bytes to \$FFFx instead of \$FFFx.

If your II uses a 6502 instead of a 65C02, then there are some additional caveats. The most annoying is that the two processors push the return address for a subroutine call (JSR) onto the stack in reverse order to each other. With ordinary returns (RTS) this poses no problem, but some programs push an address onto the stack and execute a return in order to jump to that address. A nasty incompatibility results. If the address pushed onto the stack were \$1234, the address pulled off the stack would be \$3412. Ouch! Instant crash or other unpleasant occurrence.

Still the idea seems so good that there must be another way to do it, and there is, but it's going to cost you a bit more. The best way to get the 16 bit power is to use the 65C816 as a coprocessor. That means a separate circuit card with buffers and such. A necessary complication. I've been thinking about it and I believe it can be done without too much expense, say for under \$75.

I don't have any slots left open in my IIe so I'm not going to design this card to use one. I'm not to thrilled, anyway, on how the DMA protocol (if there can be said to be one) has been used and abused. For the sake of compatibility, I'm going to use a jumper to the 6502 socket on the motherboard and plug the 6502 (or 65C02) into our board. That way you have complete compatibility with your old software since it's your regular processor that will be running it.

Coprocessor—that means that they both run at the same time, in different memory spaces. Whenever the coprocessor (65C816 chip) wants to access the IIe memory, it bumps the 6502 out of circuit, transparently. That's right, another DMA protocol! And, since the coprocessor is running in it's own memory space, why

not run a little faster, 4Mhz using 100ns memory sounds about right.

Those of you who speak "hardware" (hackers) have probably figured out where I'm heading. This is the long awaited Computist cracking card. Is there really any interest remaining in cracking cards? Well this is a lot more than just a cracking card, it's a way to expand the speed and capability of the software that will run on any II. I have several different designs and Computist has schematic modeling software, so it wouldn't be too hard to convert this idea into a circuit card. Is anyone really interested? I'm probably going to build one for myself, anyway, but if anyone else is interested I will check into the cost of ordering more boards. I usually only order two prototypes.

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Most Wanted

Airheart, Broderbund
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 Bad Street Brawler, Mindscape
 Bank Street Writer Plus, Broderbund
 Beyond Zork, Infocom
 Bilestoad, Datamost
 Border Zone, Infocom
 Borg, Sirius
 Bouncing Kamungas, Penguin
 Boxing, ?
 Bubble Bobble, Taito
 Bubble Ghost IIgs, Accolade
 Bureaucracy, Infocom
 Centauri Alliance, Broderbund
 C'est La Vie, Adventure International
 Comics, Accolade
 Cosmic Relief, Datasoft
 Crime & Punishment, Imagic
 Darklord, Datasoft
 Deathlord, ?
 Desecration, Mind Games
 Designasaurus 128K, Britannica
 Dig Dug, Thunder Mountain
 Disk Optimizer System, Nibble Notch
 Dondra, Spectrum Holobyte

The Duel: Test Drive II (IIgs), Accolade
 Dungeons and Dragons, Master Assitant vol2, SSI
 Dungeon Master (IIgs), FTL
 DROL, Broderbund
 Eliminator, Adventure International
 Epoch, Sirius
 Explore-Australia, Dataflow Computer Service
 Evolution, Sydney
 Falcons, Piccadilly
 Factastics Trivia, Daystar
 Force 7, Datasoft
 Frogger, Main Street
 The Games: Winter Edition, Epyx
 GEOS, Berkley Softworks
 Geometry GS, Broderbund
 Gladiator, Taito
 Goldrush, Sierra On Line
 Gorgon, Sirius
 GradeBuster 1 2 3, Grade Buster
 Gutenberg Sr., Micromation LTD.
 Halls of Montezuma, Electronic Arts
 High Orbit, Softsmith
 Horizon V, Softsmith
 Ice Demons, Morningstar
 Indoor Sports, Mindscape
 Infocomics, Infocom
 Jack Nicholson: Greatest 18 Holes, Accolade
 Jane, ?
 Joker Poker, Mindscape
 Kid Niki, DataEast
 Kingdom of Facts, Santa Barbara/Thunder Mountain
 Lancaster, SVS
 Legacy of the Ancients,
 Lost Tomb, Datasoft
 Manhunter New York IIgs, Sierra On Line
 Math Blaster Plus 3.5, Davidson
 Mavis Beacon Teaches Typing, Software Toolworks
 Microwave, Cavalier
 Might and Magic II, Activision
 Modem MGR, MGR Software
 Mr. Pixel's Cartoon Kit, Mindscape/Thunder Mountain
 Mr. Pixel's Programming Paint Kit, Mindscape/Thunder Mountain
 National Inspirer, Tom Snyder Productions
 Observatory (The), Mindscape/Lightspeed Software
 Odin, Odessta
 Operation Wolf, Taito
 Pensate, Datasoft/Softdisk
 Phantoms 5, Sirius
 Pig Pen, Datamost
 Platoon, Data East
 Project: Space Station, Advantage
 Pulsar II, Sirius
 Pure Stat Basketball, ?
 Quadratic Equations II, Olympus Educational Software
 Questron II, Electronic Arts
 Rails West, SSI
 Rastan, Taito
 Read n' Roll, Davidson
 Rear Guard, Adventure International
 Renegade, Taito
 Rescue Raiders, Sir Tech
 Rings of Saturn, Level 10
 Risk, Leisure Games
 Rocket Ranger (IIgs), Cinemaware
 S.D.I. (IIgs), Cinemaware
 Sailing Trough Story Problems, DLM/Neosoft
 Sea Stalker, Broderbund
 Serpentine, Broderbund
 Skeletal System, Brainbank
 Sky Shark, Taito
 Soko-Ban, Spectrum Holobyte
 Sound Song & Vision, Advanced Software
 Space Ark, Datamost
 Spare Change, Broderbund
 Spectre, Datamost
 Speedy Spides, Readers Digest
 Star Cruiser, Sirius
 Star Maze, Sir Tech
 Street Sports Soccer, Epyx
 StickyBear Math: Add & Subtract, Optimun Resources
 Stickybear GS Versions 3.5, Xerox
 Strike Fleet, Electronic Arts
 Succession, Piccadilly
 Superstar Ice Hockey, Mindscape
 Superstar Indoor Sports, Mindscape
 Talking Text Writer GS, Scholastic
 Tangled Tales, Origin Systems
 Test Drive, Accolade
 The Three Stooges (IIgs), Cinemaware
 Thunder Chopper, ?
 Ticket to Washington D.C., Blue Lion Software
 Tomahawk, Electronic Arts
 Tomahawk (IIgs), Datasoft
 Triad, Adventure International/Thunder Mountain
 Trinity, Infocom
 Ultima Trilogy, Origin Systems
 Volcanoes v1.8, Earthware Comp. Services
 War in the Middle Earth, Melbourne
 Wasteland, Electronic Arts
 Wayout, Sirius
 Wings of Fury, Broderbund
 Wizardry: Return of Werda, Sir-Tech.
 Word Attack Plus (IIgs), Davidson
 Works (the), First Star Software
 Zenith, Softsmith

Software Pirates Inc.

Softkey for...

F-15 Strike Eagle

Requirements:

A good copy program (like BACKUP.EXE or COPYIIPC.EXE) DEBUG.COM (from your DOS disk) U-FORMAT.EXE (can be found on most Bulletin Boards)

The copy protection scheme used by Micro Prose on F-15 Strike Eagle is very good. I have found no commercial copy program that can make a usable backup copy of this disk. The F-15 master disk has track 10 specially made. Track 10 has 16 sector ids on it instead of the normal 8 or 9. Using COPYIIPC, track 10 will be reproduced with only 10 ids on it. When F-15 boots up it verifies, in two places, that all 16 sector ids exists. The sectors on track 10 contain no usable data. F-15 just makes sure that they exists. Knowing this we can go in and patch F-15 so that it doesn't check track 10 at all. After patching the program we can go in and re-format track 10 to normal sector size. With this done, you will have a working copy of F-15 Strike Eagle that can be copied by DISKCOPY.COM.

1. Make a backup copy of your master F-15 Strike Eagle disk. Your copy program must be able to handle non-DOS sector sizes. Norell BACKUP or Central Point COPYIIPC can do this. Remember to copy both sides of the disk, F-15 is double-sided. Once you have copied the master disk put it away. You will not be needing it again.

NOTE: The backup copy just made will not function ... yet. When you are done with Step 2, the disk will run. When you are done with Step 3, the disk will be DISKCOPYable.

2. Load DEBUG into memory. Put F-15 backup copy into drive A. From the DEBUG prompt "-", enter the following:
L 0 0 36 1

This command will load the 7th sector on track 3 side 0 into memory. At this point we want to patch the two locations that check track 10 for 16 sector ids. To do this type the following:
E123 E9 11 10 90
E19B E9 11 10 90

Now we want to write the changes back to disk. To do this type the following:
W 0 0 36 1

At this point your backup disk will now function!

3. Now we want to re-format track 10 to normal double-sided track. U-FORMAT.EXE will do this job quite well. You want to format track 10 with 8 sectors on 2 sides.

Having completed the above 3 steps, you will have a working copy of F-15 Strike Eagle the can be copied by DISKCOPY.COM.

NOTE: If you cannot find U-FORMAT.EXE, F-15 will still work. If you diskcopy F-15, it will give error on track 10. But the copy will work.

The Mad Hacker

Softkey for...

King's Quest IV: The Perils Of Rosella

Sierra On-line

To remove the annoying questions at the start of King's Quest 4, look for a file with the extension .QA. This will give you the edition date of the SIERRA.EXE file. If you do not have the version dated 09-19-88 or 09-24-88, you cannot proceed with this patch. See the alternate softkey that follows this one.

1. Make sure you have DEBUG and SIERRA.EXE in the same DIR.

2. Rename SIERRA.EXE to SIERRA.XXX.

3. Enter DEBUG and type the following:

If you have the 09-19-88 version, use this patch.

E 0394 82
E 0CB4 90 E8 38 98
E A4A9 B8 08 35 CD 21 89 1E 7E 12 8C 06 80 12 B8 23 35 CD 21 89 1E
E A4BD 82 12 8C 06 84 12 B8 24 35 CD 21 89 1E 86 12 8C 06 88 12 07
E A4D1 1E 0E 1F BA F7 A2 B8 23 25 CD 21 BA F8 A2 B8 24 25 CD 21 1F
E A4E5 E8 5A 00 C7 06 7C 12 01 00 C3 90 80 FB 98 75 16 C7 04 32 95
E A4F9 C6 44 02 00 2E C7 06 B4 09 FF 97 2E C7 06 B6 09 A0 01 FF A7
E A50D A0 01 90 90 90 90 90 90 90 90 83 3E 7C 12 00 75 01 C3 1E
E A521 07

W
Q

If you have the 09-24-88 version, use this patch.

E 0394 74
E 0CB4 90 E8 2A 98
E A49B B8 08 35 CD 21 89 1E 5E 12 8C 06 60 12 B8 23 35 CD 21 89 1E

E A4AF 62 12 8C 06 64 12 B8 24 35 CD 21 89 1E 66 12 8C 06 68 12 07
E A4C3 1E 0E 1F BA E9 A2 B8 23 25 CD 21 BA EA A2 B8 24 25 CD 21 1F
E A4D7 E8 5A 00 C7 06 5C 12 01 00 C3 90 80 FB 98 75 16 C7 04 32 99
E A4EB C6 44 02 00 2E C7 06 B4 09 FF 97 2E C7 06 B6 09 0A 05 FF A7
E A4FF 0A 05 90 90 90 90 90 90 90 83 3E 5C 12 00 75 01 C3 1E
E A513 07
W
Q

4. Rename SIERRA.XXX back to SIERRA.EXE.

That's it! No more checks.

Alternate Softkey

If the above procedure doesn't work try the following.

1. Make sure you have DEBUG and SIERRA.EXE in the same DIR.

REN SIERRA.EXE SIERRA This will let DEBUG work on .EXE
DEBUG SIERRA

E 0394 F6
E 4210 52 5C
E 9E1D B8 08 35 CD 21 89 1E FC 12 8C 06 FE 12 B8 23 35
E 9E2D CD 21 89 1E 00 13 8C 06 02 13 B8 24 35 CD 21 89
E 9E3D 1E 04 13 8C 06 06 13 07 1E 0E 1F BA 6B 9C B8 23
E 9E4D 25 CD 21 BA 6C 9C B8 24 25 CD 21 1F E8 5A 00 C7
E 9E5D 06 FA 12 01 00 C3 90 57 51 B9 0F 00 BF 86 BA C6
E 9E6D 05 00 83 C7 09 E2 F8 59 5F 2E C7 06 10 3F 0E 01
E 9E7D E9 8F A3 90 90 90 90 90 90 90 90 90 98 90 83
E 9E8D 3E FA 12 00 75 01 C3 1E 07
E F676 8E D8 B1 03

W
Q

REN SIERRA SIERRA.EXE

That's it!

Softkey for...

Three Stooges

?

In order to crack this program, so that it no longer checks drive A: for the key disk, copy DEBUG into the same directory as STOOGES.EXE and IT.EXE. Then type the following:

REN STOOGES.EXE STOOGES this allows DEBUG to work with an EXE file

REN IT.EXE IT
DEBUG STOOGES
E 5810 EB 03 90 90 90 31

W
Q

REN STOOGES STOOGES.EXE

patch the code
write modified code to disk
quit to DOS
rename program to run

DEBUG IT
E 09C6 20 20 20 20 20 20 20 20
E 09D3 31

W
Q

REN IT IT.EXE

patch the code
write modified code to disk
quit to DOS
rename program to run

And now you have a cracked Three Stooges program. Enjoy!

Softkey for...

Accolade Software

Here is an easy way to remove the protection schemes of 4th & Inches, Test Drive, Fast Break, and other Accolade Software.

Search for 55 56 57 06 1E and replace with 31 C0 C3 06 1E. (Use Norton Utilities, DEBUG, PC-Tools, or other equivalent.)

Softkey for...

Grand Prix Circuit

Accolade

The previous Accolade deprotection scheme doesn't work with Grand Prix Circuit. With this updated protection, you must:

Search for	replace with
BE 06 00 E8 13 00	EB 16 00 EB 13 00
F6 C4 10 75 0B	EB 0E 10 75 0B
72 5F BB	90 90 BB
75 47 BE	90 90 BE
B8 09 02	EB 0A 02
75 03 E8 03	EB 03 E8 03

Softkey for...

Leisure Suit Larry II

Sierra

Leisure Suit Larry Goes Looking For Love In Several Wrong Places by Sierra On-Line has an annoying protection scheme. The player must trudge through the manual to look for girl's phone number in order to enter the game. This patch forces the program to accept any input at the prompt in the initialization of the

program, including simply pressing return.

1. Rename SIERRA.EXE to SIERRA.XXX

2. Enter DEBUG and enter the following lines.

E 0394 F6
E 4210 52 5C
E 9E1D B8 08 35 CD 21 89 1E FC 12 8C 06 FE 12 B8 24 35
E 9E2D CD 21 89 1E 00 13 8C 06 02 13 B8 24 35 CD 21 89
E 9E3D 1E 04 13 8C 06 06 13 07 1E 0E 1F BA 6B 9C B8 23
E 9E4D 25 CD 21 BA 6C 9C B8 24 35 CD 21 1F E8 5A 00 C7
E 9E5D 06 FA 12 01 00 C3 90 57 51 B9 0F 00 BF 86 BA C6
E 9E6D 05 00 83 C7 09 E2 F8 59 5F 2E C7 06 10 3F 0E 01
E 9E7D E9 8F A3 90 90 90 90 90 90 90 90 90 98 90 83
E 9E8D 3E FA 12 00 75 01 C3 1E 07
E F676 8E D8 B1 03

W
Q

3. Rename SIERRA.XXX back to SIERRA.EXE

Softkey for...

Star Trek: The Kobayashi Alternative

Simon & Schuster

Softkey for...

Rampage The Last Ninja

Activision, Inc.

The protection scheme can be bypassed with Central Point Software's NOKEY (distributed with COPY II-PC), or you can search through ST.EXE for CD 13 and replace it with 90 90.

You can use this patch with most software that NOKEY works with, since you are NOP'ing out the INT 13 that checks the disk drive.

Softkey for...

Manhunter: New York

Sierra

Use PCTOOLS or NORTONS to search the file MHVOL.1 for 41 06 7A and change to 7F C3 00. Write the changes to the disk or use debug and the following steps. (Press the space bar when you see "<space>".)

DEBUG MHVOL.1
E 1B7E
41.7F <space> 06.C3 <space> 7A.00
W
Q

Advanced Playing Technique for...

Bruce Lee

Datasoft

(This is for the disk version only.) First, Bruce Lee is an excellent product. It's just that (aaarrggghhh) you have no "falls" left, and you feel yourself quite near the finish of the game. Suddenly, one of those little dots floating on the floor taps your foot and you get zapped. You see the sign "Game Over" and you feel pretty pissed, and wish you could open the drive and rip the disk to shreds — but wouldn't that be a waste?

One thing you could do is play option C, one player vs. your opponent played by the other player. But this time, play alone, and make sure the second joystick is calibrated wrong. If the computer sees that the Green Yamo isn't moving, it will take over, so a wrong calibration will make it move all of the time. So, you're playing, but that stupid ninja is in your way and it won't let you win.

So, fix it! Eliminate him. And this is how you do it. Get a disk utility, preferably Norton Utilities. Zap the Bruce Lee disk. Make the following changes to a backup copy.

Sector	Offset	From	To
271	139	09	63
	354	09	63

That's all there is to it. Now you play, the Green Yamo flying around crazily, and the ninja... hmmm... the ninja seems to appear for a quick second then disappear. That's what's supposed to happen and there's your fix. Bye!

Softkey for...

Gato: World War II-class Submarine Simulator

Spectrum Holobyte

To unprotect GATO, use the following edit table.

Sector	Offset	From	To
53	0E	72 11	90 90
53	13	72 0C	90 90

53 53 72 EB
53 65 75 EB

Softkey for...

Trivia Master

?

To unprotect TRIVIA MASTER, follow the steps below.

1. Rename TF.EXE to TF.XXX
2. Enter DEBUG then:
E 257E
75.90 03.90
W
Q
3. Rename TF.XXX back to TF.EXE

Softkey for...

The Games: Summer Edition

Epyx

To unprotect THE GAMES, search for E8 87 00 59 C6 and change to 59 59 5F EB 55.

Softkey for...

Little Black Book

Cignet Technologies

Search the file BOOK.EXE and make these changes:

Search for	Replace with
3D 00 00 74 07 C6 06 03 01	B8 00 00 74 07 C6 06 03 00
CD 13 B8 01 02 CD 13 72 0E	90 90 90 90 90 90 EB 0E
EB F5 F6 C4 06 75 06	EB F5 F6 C4 06 EB 06

Now, search the file LBB.EXE.

Search for	Replace with
3D 00 00 74 07 C6 06 76 04 01	B8 00 00 74 07 C6 06 76 04 00
CD 13 B8 01 02 CD 13 72 0E	90 90 90 90 90 90 EB 0E
EB F5 F6 C4 06 75 06	EB F5 F6 C4 06 EB 06

Softkey for...

California Games

Epyx

Using PCTools, search for FA FC 55 56 57 and replace with 00 00 31 C0 C3.

Softkey for...

Chuck Yeager's Advanced Flight Trainer

Electronic Arts

This works for version 1.2 only.

1. Rename AFT.EXE to AFT.XXX
2. Enter DEBUG with AFT.XXX open for editing.
3. At the DEBUG "-" prompt, type
U 0DBB

Several lines of unassembled code will be displayed on the screen. You are interested in the first two. They should look EXACTLY like this:

```
xxxx:0DBB E9A3A7 JMP B561
xxxx:0DBE C3 RET
```

The "xxxx" represents any four hexadecimal numbers. If you have a match, on to the next step. If not, you probably have the wrong version. Sorry!

4. At the "-" prompt again, type
U 0E38

Several lines of code will again be displayed on screen. Look at the first two following the "U 0E38" command. They should also match exactly with the following:

```
xxxx:0E38 880E5005 MOV [0550],CL
xxxx:0E3x 8A0E4D05 MOV CL,[054d]
```

If you have a match here, then you should have a compatible version of the AFS program. If not, sorry!

5. At the "-" prompt, type the following:
E 0DBB 90 90 90
E 0E38 C3 90 90 90
W
Q

6. You should now be back in DOS. Rename AFT.XXX back to AFT.EXE.

That's it! You now have an unprotected copy of AFT.

Softkey for...

Power-up! Software

To deprotect any programs from POWER-UP!, use PCTools and search for E8 48 FF and change to 90 90 90.

Softkey for...

The Ancient Art of War

Broderbund

Use PCTools to search WAS.EXE for E8 F8 32 and change them to B8 01 00. Now, it's unprotected!

Advanced Playing Technique for...

Battletech

Infocom

You don't have enough C-Bills? Well, this will help. Save your game and use PCTools, with the GAME# (# = number of the save game) ready. Edit the bytes at offset 05D5(hex) and 05D6(hex). Replace them with 00 70. That should give you about 28672 C-Bills when you return to the game. You may go as high as FF 7F, which will total 32767, but I wouldn't want to go higher than that, or there could be a program interpretation messup.

Advanced Playing Technique for...

Technocop

US Gold And Epyx

If you start with only 5 lives and must go through 11 levels of harsh battle, I don't think you'll make it, unless you are lucky and fast enough to get extra lives. But you can save your game, and use PCTools to change the byte at offset 5(hex) to 05. This will return you to 5 lives. I tried fixing it with FF, but I found out that it doesn't work - I lose as if I had no lives left. You can attempt to screw around with other bytes and hopefully get more lives than five.

Softkey for...

Willow

Mindscape

Use PCTools to do the following edits to WILLOW.EXE.

Search for	replace with
CD 13 59	90 90 59
74 02 EB E6	EB 02 EB E6
75 04 3C 00	EB 18 3C 00
3C F8 75 14	3C F8 EB 14
73 0C 33 C0	EB 0C 33 C0

Softkey for...

Bop 'n Wrestle

Mindscape

Use PCTools to search BOP.EXE for B8 00 19 CD and replace with 31 C0 EB 2F.

Advanced Playing Technique for...

The Last Ninja

Activision

Not enough lives? Well, save your game and enter your hex-style editor with that save game file open for editing. Change the byte at offset 59(hex) to FF. The FF will give you 255 lives. The bottom status screen will be cluttered with "lives", but they won't effect the game.

Softkey for...

Mean 18

?

Here's how to get Mean 18 (3-29-88 version) to run on your hard disk.

1. Use DOS to copy your MEAN 18 disk to a hard disk subdirectory. Make it the current directory. Put your original diskette away (you won't need it anymore).
2. Rename the GOLF.EXE (3-29-88) file and get to work on it with Debug.

RENAME GOLF.EXE GOLF.ZAP
DEBUG GOLF.ZAP

R Record value of CS register and add 1000h to it to come up with XXXX as used below. For example, if CS=2100, then use 3100 for XXXX.

U XXXX:4FE3 You should see E8 AE 00 59 C6 06 0A 00 10. If you don't, it's a different version.

A XXXX:4FE3

XXXX:4FE3 **NOP**

XXXX:4FE4 **NOP**

XXXX:4FE5 **NOP**

XXXX:4FE6

A XXXX:4FEC

XXXX:4FEC **NOP**

XXXX:4FED **NOP**

XXXX:4FEE **NOP**

XXXX:4FEF

A XXXX:4FF2

XXXX:4FF2 **JMP 4FFF**

XXXX:4FF4

A XXXX:500A

XXXX:500A **NOP**

XXXX:500B **NOP**

XXXX:500C **NOP**

XXXX:500D **JMP 505A**

XXXX:500F

W

Q

RENAME GOLF.ZAP GOLF.EXE

3. Now make some changes to the ARCH.EXE (3-29-88) file.

RENAME ARCH.EXE ARCH.ZAP

DEBUG ARCH.ZAP

U BD9A You should see E8 AE 00 59 C6 06 0A 00 10. If you don't, it's a different version).

A BD9A

????:BD9A **NOP**

????:BD9B **NOP**

????:BD9C **NOP**

????:BD9D

A BDA3

????:BDA3 **NOP**

????:BDA4 **NOP**

????:BDA5 **NOP**

????:BDA6

A BDA9

????:BDA9 **JMP BDB6**

????:BDAB

A BDC1

????:BDC1 **NOP**

????:BDC2 **NOP**

????:BDC3 **NOP**

????:BDC4 **JMP BE11**

????:BDC6

W

Q

RENAME ARCH.ZAP ARCH.EXE

Type "GOLF" (or "ARCH" Course Architect) and enjoy!

Most Wanted

Graphitti, *George Best Phillips Academy*
Gunship, *Microprose*
Heros of the Lance, *SSI*

unClassifieds

How to place an UnClassified Ad

If possible, send text on 5 1/4 inch Apple formatted disk, include a typed sample copy with appropriate instructions. Use up to 40 characters per line, we will adjust word wrap. The Computist club member charge is \$4 (for processing) plus 50 cents per line. For non-members, the charge is \$4 plus \$1 per line. Multiple insertions of the same ad are charged only for the line rate, unless changes are made to the copy.

Special Graphics Instructions: The first three words of the first line are printed in bold for free. If you want other words bolded, use 5 characters less per line. Use 10 characters less per line if you have a lot of uppercase bold letters. Bold letters are wider than normal. Circle the words you want bolded. If you want a line centered, write **CENTER** next to that line. There is no charge for centering any line.

You must check your ad for errors, the first time it runs. Errors on our part will be corrected, then, for free. Errors or changes on your part will be charged the \$4 processing fee.

Our liability for errors or omissions is limited to the cost of the ad.

We reserve the right to refuse any ad.

Washington state residents add 7.8% sales tax.

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Tacoma, WA 98411

unClassifieds

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Byron Blystone
P.O. Box 1313
Snohomish, WA 98290

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Albuquerque, NM—87111
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505-293-5538 BBS system

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SWEET HOME, OR 97386-3220
(503) 367-6671

Apple Compatible Computer

Laser 128\$390
Laser 128EX\$425

IBM Compatible Computer

Hyundai Super 16TE
1 360K 5.25" Floppy Drive\$699
2 360K 5.25" Floppy Drive\$799
1 360K 5.25" Floppy w/30MB HD\$999

Amber Monitor\$109
Star NX1000 Printer\$189
Star NX1000R Color Printer\$249
Avatex 1200E Modem AA/AD\$ 79

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The 8Mhz Zip Chip is
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(They say they will be
ready in 6 weeks.)
The quantity 10 price is
\$169 ea.

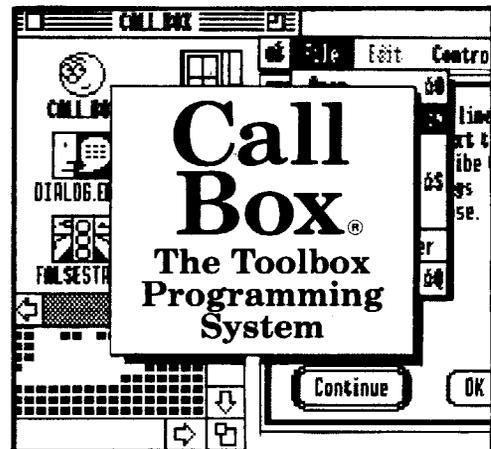
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know.RDEXed



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Four powerful **WYSIWYG** editors slash programming time dramatically for Assembly, C, Pascal and Applesoft BASIC programs, YES! . . . I said Applesoft, CALL-BOX includes the first full function Applesoft BASIC interface for the IIgs toolbox as well but let's talk about the editors first.

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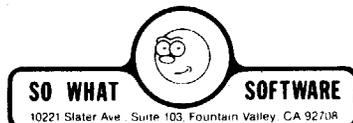
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53 Features •Modify Super IOB to read/write every other track •APT for Rings Of Zilfin: Turn yourself into a lean, mean fighting Machine •More Softkeys for M.E.C.C. software (1987) •How To Use The Electronic Art's RWTS •APT for Realms Of Darkness: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

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

51 Features •The Crypt-arithmetic Helper •Using EDD IV to Modify Tracks And Sectors •Bard's Tale APT: Dungeon Mapper Revisited •RAMfactor mod for Laser 128 •Ultima IV APT edit-tables •The Product Monitor •Get Better Sound by using the cassette jacks •Making A Fast Boot Disk •Might & Magic APT edit-tables Softkeys •2400 AD •Aliens •Alphabet Zoo •Amnesia •Bag Of Tricks •Bard's Tale I •Bard's Tale II •Battle Cruiser •Beach-head II •Below The Root •Black Magic •Body Awareness •Bridge 4.0 •Carriers At War •Catalyst 3.0 •Centipede •Championship Boxing •Championship Wrestling •Chessmaster 2000 •Combining The Elements •Commando •Creative Contraptions •Einstein Compiler •Fat City •Fight Night •Flight Simulator v2.0 •Fun with Direction •GBA 2-0n-2 Championship Basketball •GraphicWriter v1.1RA •Growing Up Small •House-on-a-disk •Intrigue •Jet •Jungle Hunt •Kindercomp •Knowing Numbers •Kung-fu Master •Law Of The West •Learning Well series •Letters And Words •Little Computer People •Make Your Own Murder Party •Manic Mansion •Master Diagnostics •Movie Maker •Music Construction Set •Pinball Construction Set •Pitstop •Print Shop Graphics Library Holiday •Print Shop Igs •Rendezvous •Shapes And Patterns •Silent Service •Sorcerer •Spy vs Spy I & II •Stargate •Stellar 7 •Stickybear ABCs •Stickybear Drawing •Stickybear Numbers •Stickybear Printer •Stickybear Printer Library I & II •Stickybear Townbuilder •Super Boulderdash •Temple Of Apshai Trilogy •Tomahawk •Thexder •Walt Disney's Card And Party Shop •Walt Disney's Cartoon Maker •Wings Of Fury •Word Maze •World's Greatest Baseball Game •Zork III APTs Bard's Tale •Lode Runner •Might & Magic •Ultima IV •W. Disney's Card And Party Shop •Wizardry III •Wizardry IV Playing Tips •Autoduel •King's Quest •Manic Mansion •Summer Games •Tass Times In Tonetown •Thexder •Where In the World is Carmen Sandiego?

50 Features •Super Boulderdash APT-writer •Softkeys to Activision/ MECC/ and PFS ProDOS/ software •Double F-8 ROM space w/o motherboard surgery •Ace-Apple bimodal Switch •Using Sider hard drives 3 1/2 inch, 800K drives, & 5 1/4 inch drives in DOS 3.3 Softkeys •Aliens •Alter Ego •Alternate Reality •Amazing Reading Machines •Amazon •American Challenge •Arcade Album #1 •Arithmetic Critters •Award Maker •Baseball Database •Bard's Tale II: Destiny Knight •BC's

Quest for Tires •Bop & Wrestle •Champ. Boxing •Champ. Wrestling •Clock Works •Commando •Computer Prep for SAT •Conflict In Vietnam •Counting Critters •Crisis Mountain •Dataquest 50 States •Deluxe Paint II •Dino Eggs •Disney Card & Party Shop •Disney Comic Strip Maker •Draw Plus •Eidolon •Electric Crayon ABCs •Expedition Amazon •Facemaker •First Letter Fun •Fish Scales •Fun From A—Z •Game Maker •GBA Champ. Basketball •GFL Champ. Football •Graphic-writer 1.0R/1.1R •Great Road Race •Hacker II •Hardball •Infiltrator II •Instant Music •James Bond 007: A View To A Kill •Jenny's Journeys •Kung Fu Master •Little People •List Handler •Manic Mansion •Mastery Arithmetic Games •Market Place •Master of Lamp •Math Rabbit •Microzine #17 •Might and Magic •Mission In Solar System •Moebius •Music Construction Set •Music Studio •Number Munchers •Paint With Words •Paintworks Plus •Path Tactics •pfs:File •pfs:Graph •pfs:Plan •pfs:Report •pfs:Write •Phonics Prime Time •Portal •Principal's Assistant •Print Shop ProDOS 8 v1.4 •Print Shop Holiday Edition •Quickflash! •Reader Rabbit •Realm of Impossibility •Robot Odyssey I v.2.0 •Rocky Horror Show •Rocky's Boots v4.0 •Saracen •Shanghai •Silent Service •Skylab •Sound Tracks •Speedy Math •Spindizzy •Street Sports Baseball •Sub-Mission •Super Boulderdash •Tass Times in Tonetown •Thexder •Top Fuel Eliminator •Word Handler •Word Munchers •Words at Work •World Karate Champ. •Writer's Choice: Elite •Zardax v5.2.1

49 Features •Eliminate some ProDOS erroneous error messages •Date/time without a clock card •Sector surgery: recover lost files •Generating Applesoft programs "on-the-fly" •Product Monitor reviews •How to convert List Handler files into standard text files •How to make GRAPHIC.GRABBERV3 run on the IIgs •Laser 128 "absolute" Reset Playing Tips •Bard's Tale II •Conan •Donkey Kong •Hacker I •Hard Hat Mack •Orbitron •Print Shop Companion •Spellbreaker •Spy Hunter •Ultima 4 APTs Infiltrator •Lode Runner •Montezuma's Revenge •Swordthrust series Softkeys •Addition Logician •Animate •Arcade Boot Camp •Arctic Fox •Bard's Tale II •Cat'n Mouse •Counting Critters •Dam Busters •Destroyer •Draw Plus v1.0 •Dr. Ruth's Comp. Game Of Good Sex •Echo 1.0 •E.D.D. 4 •Gamemaker •Hard Ball •Infiltrator •List Handler •Locksmith 6.0 Fastcopy •Magic Slate •Math Critters •Millionaire •Mind Mirror •One On One •Paintworks Plus v1.0 •Paintworks Plus v1.1 •PHM Pegasus •Portal •Quotient Quest •Reader Rabbit •Saunders's Chemistry CAI •Science Toolkit •Shanghai •Strip Poker •Super Bunny •Super Sunday •Swordthrust series •Term Paper Writer •Thief •Top Fuel Eliminator •Typing! •Up-n-Down •Willey Byte •Writer's Choice Elite v1.0 •Writing A Character Sketch •Writing A Narrative

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

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

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

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

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

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

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

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

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

39 Softkeys •MIDI/8+ •Homeward v2.1 •Borrowed Time •Amazon •Speed Reader II •Discovery! •M-ss-ng L-nks series •Donald Ducks's Playground •Mastering the SAT •Copy II Plus 4.4C •Master of the Lamps •One on One •Bridge Baron •A.E. •Great American Cross-Country Road Race •Computer Preparation for the SAT •Castle Wolfenstein •Luscher Profile •Skyfox •Silent Service •Echo Plus •Swash-

buckler •Randamn Features •Electronic Disk Drive Swapper •Abusing the Epi-Logues •Print Shop Companion's Driver Game Core •Keyboard Repair •Fixing the Applesoft Sample Disk

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

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

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

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

34 Softkeys •Crisis Mountain •Terripin Logo •Apple Logo II •Fishies 1.0 •Spell-Works •Gumball •Rescue at Rigel •Crazy Mazey •Conan •Perry Mason: The Case of the Mandarin Murder •Koronis Rift Feature •More ROM Running Core •Infocom Revealed

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

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

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

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

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

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

27 Softkeys •Microzines 1-5 •Microzines 7-9 •Microzines (alternate method) •Phi Beta Filer •Sword of Kadesh •Another Miner 2049er •Learning With Fuzzywomp •Bookends •Apple Logo II •Murder on the Zinderneuf •Features •Daleks: Exploring Artificial Intelligence •Making 32K or 16K Slave Disks •Core •The Games of 1985: part II

26 Softkeys •Cannonball Blitz •Instant Recall •Gessler Spanish Software •More Stickybears •Financial Cookbook •Super Zaxxon •Wizardry •Preschool Fun •Holy Grail •Inca •128K Zaxxon •Feature •ProEdit •Core •Games of 1985 part I

25 Softkeys •DB Master 4.2 •Business Writer •Barron's Computer SAT •Take 1 •Bank Street Speller •Where In The World Is Carmen Sandiego •Bank Street Writer 128K •Word Challenge •Spy's Demise •Mind Prober •BC's Quest For Tires •Early Games •Homeward Speller •Feature •Adding IF THEN ELSE To Applesoft •Core •DOS To ProDOS And Back

24 Softkeys •Electronic Arts software •Grolier software •Xyphus •F-15 Strike Eagle •Injured Engine •Mr. Robot And His Robot Factory •Applicellin II •Alphabet Zoo •Fathoms 40 •Story Maker •Early Games Matchmaker •Robots Of Dawn •Feature •Essential Data Duplicator copy parms •Core •DOS-Direct Sector Access

22 Softkeys •Miner 2049er •Lode Runner •A2-PB1 Pinball •The Heist •Old Ironsides •Grandma's House •In Search of the Most Amazing Thing •Morloc's Tower •Marauder •Sargon III •Features •Customized Drive Speed Control •Super IOB version 1.5 •Core •The Macro System

20 Softkeys •Sargon III •Wizardry: Proving Grounds of the Mad Overlord and Knight of Diamonds •The Report Card V.1.1 •Kidwriter •Feature •Apple II Boot ROM Disassembly •Core •The Graphic Grabber v3.0 •Copy II+ 5.0: A Review •The Know-Drive: A Hardware Evaluation •An Improved BASIC/Binary Combo

19 Softkeys •Rendezvous With Rama •Peachtree's Back To Basics Accounting System •HSD Statistics Series •Arithmetickle •Arithmekicks and Early Games for Children •Features •Double Your ROM Space •Towards a Better F8 ROM •The Nibbler: A Utility Program to Examine Raw Nibbles From Disk •Core •The Games of 1984: In Review-part II

16 Softkeys •Sensible Speller for ProDOS •Sideways •Rescue Raiders •Sheila •Basic Building Blocks •Artsci Programs •Crossfire •Feature •Secret Weapon: RAMcard •Core •The Controller Writer •A Fix For The Beyond Castle Wolfenstein Softkey •The Lone Catalog Arranger Part 1

1 Softkeys •Data Reporter •Multiplan •Zork •Features •PARMS for Copy II Plus •No More Bugs •APT's for Choplifter & Cannonball Blitz •"Copycard" Reviews •Replay •Crackshot •Snapshot •Wildcard

Out-of print Back Issues

Due to popular demand, these sold-out issues are available now as "zeroxed" copies, full-sized and center stapled.

23 •Softkeys •Choplifter •MuPlot •Flashcalc •Karateka •Newsroom •E-Z Draw •Gato •Dino Eggs •Pinball Construction Set •TAC •The Print Shop: Graphics

Library •Death In The Caribbean •Features •Using A.R.D. To Softkey Mars Cars •How To Be The Writemaster •Core •Wheel Of Money

21 •Softkeys •DB Master version 4+ •Dazzle Draw •Archon •Twerps •Advanced Blackjack •Megaworks •Summer Games •College Entrance Exam Prep •Applewriter revisited •Features •Demystifying The Quarter Track •Core •Proshadow: A ProDOS Disk Monitor

18 •Softkeys •Scholastic Version of Bank Street Writer •Applewriter IIe •SSI's Non-RDOS Disks •BPI Accounting Programs and DesignWare Programs •Features •Installing a Free Sector Patch Into Applewriter IIe •Simple Copy Protection •Core •The Games of 1984: In Review •65C02 Chips Now Available •Checksoft v2

17 •Softkeys •The Print Shop •Crossword Magic •The Standing Stones •Beer Run •Skyfox •and Random House Disks •Features •A Tutorial For Disk Inspection and the Use Of Super IOB •S-C Macro Assembler Directives (reprint) •Core •The Graphic Grabber For The Print Shop •The Lone Catalog Arranger Part Two

15 •Softkeys •Mastertype •Stickybear BOP •Tic Tac Show •The Financial Cookbook •Escape from Rungistan •Alien Munchies •Millionaire •Plato •Features •MREAD/MWRT Update •Core •A Boot from Drive 2 •DB Master's Data Compression Techniques •Whiz Kid •DOS and the Drive - Part One •Adventure Tips •Time Zone •Mission Asteroid •Enchanter •Zork I •Ultima • Ultima II •Death in the Caribbean •Gruds in Space •Zork III •Starcross

14 •Features •Super IOB v1.2 Update •Putting Locksmith 5.0 Fast Copy Into a Normal Binary File •Batman Decoder Ring •A fix for DiskEdit •Softkeys •Seadragon •Rocky's Boots •Knoware •PFS Software •Computer Preparation SAT •MatheMagic •Review •Boulder Dash

13 •Softkeys •Laf Pak •Beyond Castle Wolfenstein •Transylvania •The Quest •Electronic Arts •Snooper Troops (Case 2) •DLM Software •Learning With Leeper •TellStar •Core •CSaver: The Advanced Way to Store Super IOB Controllers •Adding New Commands to DOS 3.3 •Fixing ProDOS 1.0.1 BSAVE Bug •Review •Enhancing Your Apple •Feature •Locksmith 5.0 and Locksmith Programming Language.

12 •Softkeys •Zoom Graphix •Flip Out •Lion's Share •Music Construction Set •Hi-Res Computer Golf II •Suicide •Sabatage •Millionaire •Time is Money •Type Attack •Features Pseudo-ROMs on the Franklin Ace •Core •Psychedelic Symphony •The CORE Disk Searcher •The Armonitor •Adventure Tips •Cranston Manor •Enchanter •Kabul Spy •Colossal Caves •The Witness •Pirate Adventure •Ultima III-Exodus •Adventureland

11 •Softkeys •Sensible Speller •Exodus: Ultima III •SoftPom Adventure •The Einstein Compiler v5.3 •Mask of the Sun •Features •Copy II Plus v4.4C: Update Of An Old Friend •Parameter List For Essential Data Duplicator •Core •Ultimaker III •The Mapping of Ultima III •Ultima II...The Rest Of The Picture

10 •Softkeys •Arcade Machine •Bank Street Writer •Minit Man •Senible Speller IV •EDD IV •Krell LOGO •Canyon Climber •Features •The Controller Saver •Examining Protected Applesoft BASIC Programs •Crunchlist II •Core •Appear - Voice Aynthesis •Introducing the 65SC802 and 65SC816 Chips •Review •Dino Eggs •Adventure Tips •Cranston Manor •Zork I •Planetfall •Mission Asteroid •Time Zone •Suspended •Critical Mass •Zork II •Castle Wolfenstein

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

8 •Softkeys •Robotron •Legacy of Llylgamyn •The Artist •Data Factory v5.0 •EDD IV •Spy Strikes Back •Hayden Software •Apple LOGO •Features •Review of the Bit Copiers •Core •COREfiler •ProDOS Data Encryptor •Adventure Tips •Ulysses and The Golden Fleece •Serpentine •Ultima II •Castle Wolfenstein •Death in the Caribbean •Zork I •Zork II •Gruds in Space •Enchanter •Infidel •Serpent's Star •Whiz Kid •How Data is Stored on Disk

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

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

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

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

3 •Softkeys •Bag of Tricks •Multiplan •Visiplot /Visitrend •Sneakers •Wizardry •Features •No More Bugs: The Sequel •Hidden Locations Revealed •Map Maker •APTs •Chopflifer •Adventure Tips •Cranston Manor •Strange Odyssey

2 •Softkeys •Magic Window II •Multiplan •Features •Parameters for Locksmith 4.1 •Page Flipper •String Plotter •Three-D Wall Draw •Core Checksums •Input •Reviews of unprotected commercial software

Early CORE Special Issues

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CORE 2—Utilities: •Dynamic Menu: create your own menu •High Res Page Hijinks: move page2 to page1 (fast, top to bottom, right to left), Flip page1 (upside down or mirror), Scroll Hires page1 Demo (up, down, left, right) •GOTO Label w/ Replace—use labels in your BASIC programs instead of line numbers •Line Find—find all references to any line number •Quick Copy (BASIC w/ binary): use your RAM card for faster Copying

CORE 1—Graphics: •The Apple Memory Map •How to do Text Graphics: Marquee—Boxes—Jagged Scroller •About Lores Graphics: Color Character Chart •All about Hires Graphics: Screen Cruncher (binary)—pack and unpack hires pictures to save space on disk •The UFO Factory (BASIC)—create different saucer shapes •All about Hires Color •About Vector Graphics: Shimmering Shapes (BASIC)—using page flipping for unusual effects •A Shape Table Mini-Editor (BASIC w/ binary) •About Block Graphics: Arcade Quality Graphics for BASIC Programmers •Quick Draw (BASIC w/ binary): Hires Character Generator •About Animation: Space Raid (BASIC w/ Quick Draw)—Hires shoot-em-up

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