73 COMPUTIST

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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 otherwise specified. Control characters are preceeded 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.

Laser 128: Your ROM includes a forced jump to the monitor. Press **ctrl return reset**.

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 **openapple 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 & 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 (◊) charactors. 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, when we print your letter, we will return your disk 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

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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 normal Applesoft files and machine language programs as normal binary files. We have programs to convert them to the proper format for printing. If you are sending source code files, 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 relevent 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. Check to the right of the authors name to see if the author is writing from a foreign country and includ the proper postage.

Help Line

These readers have volunteered their time to help you. Please call only within the given time frames (corrected for your time zone). No collect calls.

Jack Nissel (Disk Protection, 7-10PM EST) (215) 365-8160

Electronic Bulletin Board System (BBS)

Dave Goforth is the sysop for the Computist BBS. The number is: (206) 581-9292. If you already have a User ID# and password, sign-on using the User ID#. If you are a new user, it may take a day or so to validate your new ID# and password.

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Features, Notes and such:

Editorial Notes

COMPUTIST on Disk

I've received a number of letters suggesting I work out a way to put the issues on disk. This issue is a (over) 1Mbyte formatted Page-Maker file on a MAC. About 1/3 (I think) of that is actual text, the rest is graphics or formatting commands. So we're looking at over 300Kbytes of text and this is our smallest format, only 24 pages. We would have to use two 5.25" disks or one 3.5" disk. I estimate the cost would be about the same as the cost of a combination subscription ($100/yr/12 issues). I would like to know how many readers are really willing to pay the extra cost to get their issues on disk. Write to me if you are interested. Let me know what equipment you are using. If enough people are interested we'll see if we can find someone to do it. If someone is interested in working out a good disk format, you should also write and let me know.

Submission Notes

As of this issue I'm current on submissions up to (and including some of) March. If you sent something before March and you haven't seen it published, then you should check with me at your earliest convenience. Some letters require a lot of editing and I often bump them when I don't have enough time (a chronic condition around here). But I usually get to them by the next issue or so.

Change in Most Wanted

I've made a change in the MOST WANTED list. To the left of each title is the issue number when that title was added. You can use that number to tell how long a title has been on the list. I thought it might help if you knew which ones to concentrate on.

Library Disk Notes

There wasn't a lot in this issue in the way of type-able programs that could be put on the library disk so I copied the Eamon Master disk onto the front and put Eamon Adventure # 194, Attack of the Kretons on the back.

Jeff Hurlburt _____ TX

The PRODUCT MONITOR

RATINGS

☆☆☆☆	SUPERB
☆☆☆	EXCELLENT
☆☆☆	VERY GOOD
☆☆	GOOD
☆	FAIR
☺	POOR
☺☺	BAD
✸	DEFECTIVE

The tricky part about taking on the review of any large-scale adventure is that it's all too easy to get wrapped up in the game. When you tackle three good ones— like "Champions of Krynn", "Windwalker", and "Dragon Wars"— one after the other... More games next time; but, for sure, some serious applications stuff too.

Dragon Wars
$49.95 Interplay
☆☆☆

Requirements:
128K Apple II series
one 5.25 or 3.5" drive
IIgs recommended

In this long-play adventure from the "'Bard's Tale" people, your party is among a group of pilgrims newly arrived in Purgatory, Oceana's premier city. Incredibly, not only is the place a wreck, but you are set upon by thugs in guard uniforms, stripped of possessions, and left to fend for yourself in the world's largest prison camp.

The problem, it turns out, is that a man-demon conqueror calling himself "Namtar the Magnificent" has found a way to control the dragons upon which the great cities depend for defense. After such 'demonstrations' as Purgatory, most have surrendered, but not all. You, of course, are more determined than ever to "see the wonders of Oceana". Your vacation is spoiled and Namtar is going to pay the bill!

Given the popularity of Interplay's "'Bard's Tale" series, it will come as no surprise that "Dragon Wars" adopts essentially the same format. To the left you get the expected 3-D perspective forward view showing trees, pools, bridges, walls, etc.. To the right, bar graphs reflect current hit point/ magic power status of party members; and a small area at the bottom is reserved for message displays. As in "Bard's Tale" and "Wizardry V", combat is what I've called "semi-tactical". That is, a picture of an opponent appears; and you trade blows, cast spells, advance, flee (use artifacts, reload, change weapons, etc.) via choices presented in a combat window, which also reports results for each round. Distance is a factor for both weapons and magic as well as starting location(s) of the one or more enemy groups you face. Opponents run the gamut from easy drunks, dogs, and thieves, through giant spiders, pikemen, murk trees, goblins, wizards, demons and dragons. Over sixty types help guarantee a variety of entertaining combat situations.

Marked similarities notwithstanding, it is hardly obvious that "Dragon Wars" has a famous pedigree. Aside from a more Conanesque feel and richer, puzzle-packed scenario, the new release also embraces a bigger, more varied landscape including cities, ruins, mines, and forests spread across several islands. A sprawling (32 x 32 grid) Underworld provides several convenient back doors to widely separated topside areas, and, along with teleports and ships, helps a player who's learned the ropes avoid time-consuming journeys.

Especially welcome is a new self-mapping feature— just press "?" for a 9 x 8 'Ultima map' view showing your party and adjacent explored squares. A saved game 'remembers' this information; so there is little need for anything beyond rough pencil-and-paper sketches. Good note-taking, however, is fairly critical if you hope to avoid such errors as walking into a fatal trap after being told that "A deadly snare awaits the unwary in Freeport" (sigh). Taverns supply numerous valuable "rumors" and often you will be referred to one of the manual's 147 clue-packed "paragraphs".

Unlike most major adventures, "Dragon Wars" actually builds in few 'must do' activities. Basically, your mission is to zap Namtar and dump his bod into The Abyss. How you pull this off is, largely, an open-ended proposition, since neither finding Namtar's stronghold nor getting in is especially difficult. The catch, as may be anticipated in a realistic scenario, is that weak, poorly armed characters lacking powerful spells and artifacts will simply be blown away in the first encounter with Namtar's guards. Much of the game amounts to a quest for better weapons and armor, juicier spell scrolls, and high-power artifacts (e.g. the Dragon Horn and Freedom Sword, each of which can be "charged" for up to 49

castings of SERIOUS DAMAGE-class spells). The farther (higher, deeper) you range the better the chances of 'quality' opposition and the more truly proficient you become in the use of your Druid, Sun, High, and Low Magic spells (65 in all), special "Abilities" (e.g. tracking, climbing, etc.), and arms.

The IIgs recommendation, of course, reflects the no-swap, no-flip convenience of 3.5" media; but only partly. In "Dragon Wars" all newly created characters begin with identical, low numbers for Strength, Dexterity, Magic Power, etc.. You assign a name and gender, and then tailor the character by spending 50 "Bonus Points" to raise attributes and/or enable weapons, magic, and other skills. You can create or transfer-in (from IIe versions of "'Bard's Tale" I-III) up to four characters. The other three slots are filled by recruits found in camps and taverns or by temporary creatures you summon. Unfortunately, while your heroes can survive, at just two new Bonus Points per Level of advancement, character growth slows to a crawl. Due chiefly to very limited Magic Power, progress is bound to bog down in major league monster areas as you must repeatedly break off promising explorations to seek a power recharge for your spell casters.

Putting the above in perspective: when, after several days of enjoyable play, I finally achieved victory, my characters had reached only Level 20 or so— this after mapping virtually every square of the game and slaughtering veritable armies. Well, Level 20 corresponds to a mere 20 additional Magic Power. Without the benefit of significant 'external boosts' (i.e. I pumped-in something like 400 additional Bonus Points per character), playing time could easily have tripled— most of it spent in boring, drawn-out hacking matches. (Naturally, NOW, I could win with a much weaker party; so, no doubt, could/did? a beta tester working with a full set of annotated maps.) The game's rating assumes play on a IIgs where, when a user just can't stand another five-minute sword fight with pissants, he or she can enter the monitor and soup-up magic user power (at $403B, $423B, ... $4C3B). A better approach is to start off new characters with 127 Bonus Points (enter $7F); and restrict later additions to 15-20 points upon each level increase.

Note: It may be that IIe users can make the Bonus Point additions to diskette character files (byte $3B in each). I did not try it because on-disk data is notorious for being booby trapped (e.g. via checksums); and there is no easy way to tell how far into the game a trap will 'kick in'. To the credit of DW's designers and Interplay, the diskettes are not protected, in-memory character info is not hidden, and the standard IIgs interrupts are not switched off.

Though sound is just a notch above silence— after a musical intro about all you will hear is your footsteps— "Dragon Wars" boasts, in all probability, the very best double-hires displays of any adventure. Baywoof (the ex-IIgs user) happened to walk in during one gaming session and, after taking a hard look at the beautifully done artwork and animation of a monster pic, he actually asked if the game was done in super-res! Add smooth point-and-click mouse operation and you have a very attractive adventuring package: easy to 'get into', absorbing, and definitely 'different'.

Fast Frames, Updates, etc.

2088: Bargain Thrills

From Vinay Pai at Victory Software re. "2088: The Cryllan Mission":

"Although the list price is $69.95, Roger Coats and Program Plus are offering it for nearly 50% off list price. Additionally, any Egghead Discount Software store can specially order our product (SKU 585-844)."

Dragon Wars Tavern Tales

"... still packs the Slicer he found in the Underworld and Rubywand favors her Dragon Sword. Still when y' want a good solid hit and a few extra yards o' reach, it's tough to beat this here Dragon Tooth."

"My archer wasn't worth spit 'til we found that cache of Grey Arrows in the guard house near the bridge. 'Course, the guards made a terr'ble fuss; but now we can jus' walze in there any old time, spring the lock, and... some other nice stuff in the same chest... "

"... to use the Spectacles again and scarf up on more goodies? Right? But it didn't work. You get to the last room and the door is missing! Then Rubywand says, 'Look, we've sprung Zaton; so, let's ditch the Bowl and give it another try.'..."

"... been sinking for years. Well, Doc Gorbash takes one look and says: 'Hydraulics, Gentlemen, is hydraulics. There has to be a mud leak somewhere. ...'"

"... we're about to say adios to the Underworld and try out Lansk hospitality, when Mothnose spots this weird pool just a stone's throw to the west... "

"... claims they tinkered up a mean little beauty called the Dragon Horn; and it's still down there. Trouble is, no one knows what happened to the dwarfs."

"So this mean mud sucker is sittin' there waitin' to be fed and I'm startin' to think maybe we're on the menu. Then ol' Batfoot here blurts out: 'The Mystic Woods! I've still got those... "

Too Easy?

Supposed you're updating some favorite application diskette to GSOS 5.0 and discover that all your neat stuff won't quite fit. (Gasp! Oh No!) Not to fret; if one of the programs loads a non-packed startup picture (e.g. a $C1 file) and

losing it causes no great concern, you can, more likely than not, safely shrink it and obtain an extra 30K+. For example: entering BSAVE SPLASH,T$C1,A$0000,L$1 will replace a 32K picture named "Splash" with a version using less than 1K. The program still has a "picture" to load (rather quickly, I might add); and you have an extra chunk of diskette space.

No Clue in the Pool

Responding to various rumors, SSI's Linda Blanchard notes that there is currently no plan to supply free Clue Books with any of the TSR D&D adventures.

Regarding David Stewart's observation that "Pool of Radiance" left him wandering and victoryless: Yes, due largely to the piecemeal nature of the quest (i.e. you are supposed to clear the city of Evil), the game is known for its unspectacular ending. Anyone who wipes out all opposition can safely declare Victory. Later SSI releases, notably "Champions of Krynn", are much better about celebrating your success. As to being able to wander around after winning: this is an on-purpose feature of TSR adventures intended to permit characters on the verge of Level promotion to advance in preparation for the next adventure.

Vendors

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

Interplay Productions: 1575 Corporate Drive, Costa Mesa, CA 92626 atten: Mkt. Director (714-545-9001; orders: 800-227-6900)

Strategic Simulations Inc.: 1046 North Rengstorff Ave., Mountain View, CA 94043 atten: Linda Blanchard (415-964-1353)

Victory Software: P.O. Box 821381, Houston, TX 77282-1381 atten: Vinay Pai (800-232-3828, in Texas call 713-493-3232)

The Big Durf _____ CA

Comments on Assembly Language Programming for Beginners

A number of new subscribers are not quite conversant with assembly language. Neither am I, really. I just dabble with the stuff, and barely know what most of the Opcodes mean, let alone how they work together in the more complex programs. I can just do simple stuff.

What do you do when it comes time to learn assembly language programming? Here are the books and programs that I find to be very valuable and worth their weight in silicon (ha, ha).

First off, you need an assembler. I've listed these from best to worst, in my opinion:

1) Merlin 8/16 or Merlin Pro
2) S-C Macro Assembler
3) Orca/M E-Z assembler
4) Microsparc assembler
5) Apple's DOS toolkit or ProDOS assembler
6) LISA (Lazer systems)

You can get the Microsparc Assembler (the one I have) from Microsparc Inc. This assembler is excellent, for my tastes, and will be adequate for almost all of your assembly needs, although it is nothing special. Apple still sells the DOS Toolkit assemblers and the ProDOS developers disk at outrageous prices. You can get Merlin from Silicon Express for $88.95, and it is a complete package, with four different operating systems supported (DOS 3.3, ProDOS 8 & 16, and GS/OS), disassembler, list debugger, and many utilities and source listings. Merlin is, of course, the best assembler you can get for the Apple line of computers. If you get it, you won't need anything else.

If your assembler doesn't come with a disassembler, then you can get Munch-A-Bug from Rodger Wagner Publishing, Inc., and it will do everything you need, including mini-assembler.

Now, what to do with the assemblers? Well, you get a some books and read and do everything they say. Here are some books, listed in no particular order:

1. Assembly Lines: The Book by Rodger Wagner.
2. Apple Assembly Language Programming by Malcolm Whapshott.
3. Assembly Language for Beginners by Leventhal.
4. Apple Programmer's Handbook by Paul Irwin.
5. Beginner's Guide to Apple II Assembly Language by S. Scott Zimmerman.
6. 6502 Subroutines by Leventhal (and 6502 Assembly Language Programming by same).
7. Third Book of Apple Secrets by Nibble / Microsparc.
8. Your Apple Games Gallary by Nibble / Microsparc.
9. Nibble Express IX by Nibble / Microsparc.
10. Beneath Apple DOS by Lechner / Worth.
11. Beneath Apple ProDOS by Lechner / Worth.

The Apple Assembly Language Programming book comes with an assembler, a pretty OK one but I prefer the Microsparc Assembler or Merlin. You can get books 1,10 and 11 from Silicon Express pretty cheap. You can get books 3 and 6 from A-2 Central. You can get books 5,7,8, and 9 from Nibble / Microsparc Publications. You can get books 2,4 and 5 from Howard W. Sams Co. In all, the whole package will probably cost around $200, and the assembler from $50 (Microsparc Assembler) to $100 (Merlin 8/16). So, assembly will cost as much as a complete Pascal or Cobol or "C" package, but is infinitely more rewarding to learn, and is the

language of choice among all of the professional programmers in the world today. Besides, assembly is the language that the aforementioned high-level languages are written in.

The books above will contain almost everything you need to know, but not all. You can obtain a technical reference manual from Apple (or from Videx Techs. for Laser 128 owners) with $F800-$FFFF disassembly (commented upon, hopefully), and the Merlin comes with a disassembly (commented) of Applesoft. The Beneath Apple DOS book contains all you need to know about DOS locations, along with Computist #60.

I am not into assembly on the IIgs, but if you insist upon it, then I would recommend that you acquire some of the following stuff on IIgs assembly language. I don't have any of these books, but I am sure that they are all excellent. You can get them all from A-2 Central.

IIgs Machine Language for Beginners by Wagner.

Programming the IIgs in Assembly Language by Lichty / Eyes.

Programming the IIgs in C and Asm. Language by Andrews.

Programming the 65815 by Lichty / Eyes.

Apple IIgs Asm. Language Programming by Scanlon.

Programmer's Intro to the IIgs by Apple.

Apple IIgs Toolbox Reference, Vol. I by Apple.

Apple IIgs Toolbox Reference, Vol. II by Apple.

A-2 Central also has several of Apple's technical references for the IIgs, as well as several other IIgs books. I can only suggest the Merlin 8/16 assembler, the S-C Macro Assembler version 2.0 or later, or the ORCA/M GS version of the Orca/M assembler. The Merlin is, of course, the best as far as the overall package and ease of GS use goes, with complete GS stuff.

Now that you have spent all of that money, I am going to ask you to spend a bit more. The following list of disks/programs I consider essential when using Assembly language programming regularly. I have all of the below stuff hidden in corners of my room, and I use Copy II+ and the Assembler most often, in conjunction with Appleworks. Why a word processor? Easier to write a source file with, then save and assemble with your assembler. Face it, the assemblers have really crummy editors, and you need a word processor for them long jobs that take all night to type in after 2 months of writing on paper.

DOS 3.3 system master
ProDOS 8 system master (or ProDOS 16 / GS/OS)
Copy II+ or Locksmith bitcopying utilities
Appleworks, Applewriter IIe or comparable word processor

Here is my suggested Hardware (for IIe if you don't already have it):

2 Disk Drives
Printer
128K or more memory
80 columns
NMI card (Laser 128 owners can just press **ctrl reset M**)

Addresses

Here's the list of address' for all of the companies mentioned above. They will all be happy to send you prices of any of their merchandise, and many have free catalogs.

Silicon Express, Box 850, Patlaska, OH 43062 (1-800-999-6868)

Howard W. Sams and Company, 4300 W. 62nd Street, Indianapolis, IN 46268 (1-800-428-SAMS, FAX 1-317-298-5604)

A-2 Central, P.O Box 11250, Overland Park, KS. 66207

MicroSPARC Inc. and Nibble Publications, 52 Domino Drive, Concord, MA. 01742-9906 (Tech Support: 508-371-1669, Modem Line: 508-369-8920)

Apple Computer, 10260 Bandley Drive, Cupertino, CA. 95014 (1-408-996-1010)

Central Point Software, 9700 SW Capitol Highway, Portland, OR. 97219 (1-503-244-5782)

Computer Direct, 22292 N. Pepper Road, Barrington, Ill. 60010 (1-800-BUY-WISE or 1-312-382-5058)

Applied Engineering, P.O. Box 815828, Dallas, TX. 75381 (1-800-327-7234)

Public Domain Exchange, 2074C Walsh, Ste. 850, Santa Clara, CA. 95050 (1-800-331-8125)

Online Store, 3037 Golf Course Dr., Ventura, CA. 93003 (805-650-0188, FAX: 805-650-0195, Modem: 805-650-0193 - awesome Modem prices & other stuff)

Roger Wagner Publishing, Inc., 10761 Woodside Ave., Ste. E, Santee, Ca. 92701

Using Copy II plus to make an APT

Ah, yes, the elusive Advanced Player's Technique. Well, there are a multitude of ways to make an APT, depending upon the type and complexity of the game you are playing. Since Ultima V has been so overkilled in Computist, I shall now beat the dead horse, so to speak.

This is not, however, an article about Ultima V. This is a brief demonstration by which I will enlighten you on a new way to make the APT process much faster. Most of the people reading this article have Copy II+, v 8.?, and if you don't, then I would suggest that you spend $20.95 at Silicon Express to get yourself a copy of the best Bitcopier around. Copy II+ has an excellent Autocopy feature. You just pre-set the parameters, and then the program does the hard work.

But, the Autocopy feature of Copy II+ has one more endearing aspect. It does Sector Edits, too. Bob Igo's Editor Creator II showed me the light. Following is a step-by-step way to use the Autocopy feature of Copy II+ to perform lightning-fast sector edits, anytime you want.

Now, let us say you just got into a nasty fight with the guards at Blackthorn's place. You are almost dead, low on spells and reagents, and just about out of Skull Keys, oh, no!. Well, you save the game, and pull out your Computist Starter Kit. Twenty minutes later, you are done editing and you are playing again, with a fresh group. Well, here is how to eliminate the 20-minute span.

1. Boot Copy II+. Chose 5.25" BITCOPY from the copy sub-menu. The computer boots BITCOPY.SYSTEM, and you chose slot 6 (or whatever). Now, go to the CREATE PARAM ENTRY option.
2. Now, the screen is cleared, and you have a prompt at the NAME: line. Enter ULTIMA V APT (EQUIPMENT).
3. Now, the prompt is at the BY: line. Just enter your name (heck, you did the typing, why not?).
4. Now, the prompt is on the first line of the editor (inbetween the dotted lines). You can have the Autocopier print a message and have you press return before the Sector Editor starts. Just enter a quote ("), then type in the message (like below), then another quote, and press return.

"INSERT YOUR BRITANNIA DISK"

The computer automatically asks you to press return to go on.

5. Now, enter the following:
SECTOR EDIT, TRACK 3, SECTOR 1,
DOS 3.3, 0F:99, 1B:99, 1D:99,
23:99/99/99/99/99 /99/99/99/99/
99/99/99, 70:99/99/99/99/99/99/
99/99/99/99/99/99 /99/99/99/99/99
, 90:FF/FF/FF/FF/FF/FF/FF/FF/99/
99/99/99/99/99/99/99
SECTOR EDIT, TRACK 3, SECTOR 4,
DOS 3.3, 80:99/99/99/99/99/99/
01, F0:FF/FF/FF/FF/FF/FF/99/FF/
FF/FF/FF/FF

And here is what it all means. Sector edit means just what it says, sector edit. Track and sector tell the computer in hex what track and sector to edit, and the DOS 3.3 message tells it that it is a 16-sector diskette. The numbers following are all in hex, and they represent an address, followed by the bytes to insert starting at that address. Those are the actual bytes to write to the disk, not the bytes to change. The above Parm entry gives your guys a full complement of equipment and spell reagents, including mystical weapons and armor, and mucho carpets and keys.
6. Press esc to edit the thing (I,J,K,M keys to move cursor), if you need to, and then press ctrl Q to quit. Now, just choose the save Parm entry from the main menu and you are done.

You can also enter similar edits for your characters, spells, and anything else you want. I have similar edits to all of my favorite games.

Autocopy Parm to copy Ultima V:
NAME: ULTIMA V
BY: ORIGIN SYSTEMS, INC.
T0-T2, SECTOR COPY
T3-T22, 15=00, 16=00, 17=AA,
18=1B,
19=AB, 1A=00, 9F=01
SECTOR EDIT, TRACK 1, SECTOR 4,
DOS 3.3, 90:EA/EA

Computist #61 has all of the sector edits for Ultima V and for Bard's Tale III, thus making it the most wanted issue around for fans of either of those games. Computist #62 has the edit needed to remove the necessity for the Bard's Tale III wheel, and Computist #63 has MOST of the necessary tips for the Ultima V game.

The Greywolf _____ MD

I am a long-time hacker and also an addict of fantasy-role playing games, the foremost of these obviously Lord British's Ultima. Although it's been a while since the debut of Ultima II, I feel that it is still a great game and that some of those owning the old version of Ultima II (as of c.1983) could use some help either making duplicates of the protected BOOT disk or editing their characters.

Softkey for...
Ultima II (Original Version)
?

To copy Ultima II, I recommend using Copy II Plus. I have not experimented with Locksmith or any other Manual Bit Copiers. Boot up Copy II, and BIT COPY the whole boot disk.

Then go to the sector editor, and read track 3, sector 0C. Change bytes $84-86 to EA EA EA. Write the sector. The other two disks can be copied with any copier, including COPYA, copy disk, and also Super Disk Copy.

Character Editing

I recommend you use any Copy II Plus for this although any sector editor can be used. Boot it up and take a look at track $04 sector $08 on the player disk.

In bytes $04-$12 are your character's name, listed in ASCII text. Byte $14 contains sex, $CD for a male and $C6 for female.

Byte $17 contains the era that you are in. $0 represents Legends, $1 Pangea, $2 BC, $3 AD, and $4 Aftermath.

Byte 18 has no interest whatsoever but can be fun to play around with. Although you can only save your character in the wilderness, if you put any value other than $00 on this byte it will save you IN A TOWN. If you add this number you will start in a town - which will disappear when you leave.

Bytes $19 through $1E are your abilities: strength, agility, stamina, charisma, wisdom, and intelligence. The values are from decimal 1 to 99. Beware of putting it to high - if you gain in these and exceed 99 you go to 1.

Bytes $1F and $20 are hit points, again in decimal form. For example if $1F=$50 & $20=$10, the H.P. will be 5010. Bytes $21 to $23 contain food. X.P. is in $24 & $25 and gold is in $26 and $27.

The place your character is at is saved in Bytes $28 and $29, X and Y respectively.

The weapon is stored in $2F, ranging from $01 dagger to $09 quicksword. Armor is byte $30. The ready spell is stored in byte $31. Bytes $32=torches, $33=keys, and $34=tools.

The # of weapons carried are in $45 to $4D. Armour is contained in bytes $65 to $6A. And also spells in $85 to $8D. The items are saved in $A4 to $B3. You can experiment and find these out very easily.

Good luck, and with these tips it should be very easy to complete Ultima II — the Revenge of the Enchantress.

Ron Stankiewicz _____ FL

⑦ I have a couple of questions I would like to address to those Alien Mind players.

Like many of you, I would prefer to play with a backup copy of Alien Mind; however, not even Copy II+ can copy it. Yet, I periodically see someone writing about editing copies of the game. How did you back it up?

⑦ In Computist #69, there was an APT to change the Saved Game Disk. I've searched the entire disk and can't find where the data is stored. Further, if I make a copy of the Saved Game Disk, it is not useable for play. Why? How do I make a copy of the disk?

⑦ For those who have finished the game— how did you do it? Through working the game over and over, and the use of maps, I eventually wound up on the last level facing the Alien with over 4000 energy points. I even set up my IBM clone next to my GS in order to create a word processing document of the entire script — every computer screen, every message, every password — in the hopes of gleaning some hint from the collective text. Still, I can't maneuver around the Alien and in a matter of seconds I find myself eliminated.

I do have one complaint aimed at the folks of Computist: Don't print lists of passwords in such conspicuous places. Yes, a few of them were extremely hard to determine. In fact, I was stuck on one for so long that I finally wrote to PBI for their "Hint Book." As Murphy's Law would have it, in the intervening time between mailing my letter to PBI and receiving the Hint Book, I determined what the password was. Anyway, it's a bit hard to read Computist with the lists right in front of you. Why not publish them in a corner somewhere, maybe even using a mirror image font. Or maybe the readers who want all or some of the passwords could write to the author of the list (remember to include a SASE).

⑦ One last question aimed at all the software authors who place all those cute little tricks, trap doors, and "Easter Eggs" in their programs: Why do you do something like that and not make public its existence?

The Home Front _____ WA

Playing Tip for...
Where in the World is Carmen SanDiego
Broderbund

Search Warrant Information
Carmen SanDiego — Tennis, Brown hair, Jewelry, Convertible
Dazzle Annie — Tennis, Blonde Hair, Tattoo, Limo
Fast Eddie B. — Croquet, Black hair, Jewelry, Convertible
Ihor Ihorovitch — Croquet, Blond Hair, Tattoo, Limo
Katherine Drib — Mountain Climbing, Brown hair, Tattoo, Motorcycle
Lady Agatha — Tennis, Red hair, Tattoo, Convertible
Len Bulk — Mountain Climbing, Red Hair, Tattoo, Convertible
Merey LaRoc — Mountain Climbing, Brown hair, Jewelry, Limo
Nick Brunch — Mountain Climbing, Black hair, Ring, Motorcycle
Scar Graynolt — Croquet, Red Hair, Ring, Limo

Culture
Aborigines	Sydney
Aztec	Mexico City
Bedouins	Cairo
British colonial rule	Singapore
Byzantine	Istanbul
Captain Cook	Sidney
Commodore Perry	Tokyo
Croatian	Budapest
Emperor	Tokyo
Etruscan	Rome
Extremely tall people	Kigali
Georgian	Moscow
Gypsies	Budapest

Harald the Fairhaired	Oslo
Hellenic (Republic)	Athens
Henry Hudson	New York
Hittite	Istanbul
King Mongkut	Bangkok
Magayar	Budapest
Malay	Singapore
Party chairman	Peking
Party secretary	Budapest
President	Kigali, New York
Prime minister	London
Regent	San Marino
Renaissance painting	Rome
Ruling council	Baghdad
Samurai warriors	Tokyo
Serendip	Colombo
Saxon	London
Shang Dynasty	Peking
Shiva	New Delhi
Spanish Colonialism	Lima
Spanish Conquistadors	Lima
Sparta	Athens
Thai	Bangkok
Tsarist	Moscow
Tutsi People	Kigali
Wuchang Uprising	Peking
Yuan Dynasty	Peking

Currency
Bahts	Bangkok
Drachmas	Athens
Forints	Budapest
Francs	Moroni, Paris
Kina	Port Moresby
Lira	Istanbul, Rome
Pesos	Mexico City
Pounds	Cairo, London
Rubles	Moscow
Rupees	New Delhi
Yen	Tokyo
Yuans	Peking

Flags
Blu/Whi	Athens, San Marino
Red	Peking
Red/Whi	Singapore
Red/Whi/Blk	Baghdad
Red/Whi/Blu	Bangkok, London, New York, Paris
Red/Whi/Grn	New Delhi
Yel/Red/Blk	Port Moresby
Red/Yel/Grn	Kigali

Landmarks
Aegean Sea	Athens
Amazon (River)	Rio
Archipelago	Tokyo
Babylonia	Baghdad
Big Ben	London
Black Sea	Istanbul
Buddhist relics	
Comoro Islands	Moroni
Constantinople	Istanbul
Coral Sea	Port Moresby
Crete	Athens
Danube (River)	Budapest
Eiffel Tower	Paris
Forbidden City	Peking
Forum	Rome
Ganges (River)	New Delhi
Garpe Peninsula	
Gran Chaco Plain	Buenos Aires
Grant's Tomb	New York
Great Sandy Desert	Sydney
Great Wall	Peking
Imperial Palace	Tokyo
Iraq	Baghdad
Island continent	Sydney
Island of Corfu	Athens
Island nation	Colombo
Kunlun Mountains	Peking
Loch Ness	London
Louve	Paris
Malacca	Singapore
Mesopotamia	Baghdad
Mount Ararat	Istanbul
Mount Blanc	Paris
Mount Karthala	Moroni
Mount Olympus	Athens
Mount Popocatepetl	Mexico City
Mount Solimana	Lima
Mount Titano	San Marino
Mozambique Channel	Moroni
Nanda Devi	New Delhi
Nile (River)	Cairo
Oil fields/wells	
Orkney Island	London
Parthenon	Athens
Peninsula SE Asia	Singapore
Petrochemical Plant	Istanbul
Pindus Mountains	Athens
Po (River)	Rome
Pyramids	Cairo
Raffles Hotel	Singapore
Rain forest	Singapore
Red Fort	New Delhi
Rhodes	Athens
Rwanda	Kigali
Sahara	Cairo
Shinto shrines	Tokyo'
Siam/Thailand	Bangkok
Sikh temples	New Delhi
Skyscrapers	New York
Sri Lanka	Colombo
Statue of Liberty	New York
Subways	New York
Sugarloaf Peak	Rio
Sumeria	Baghdad
Syrian Desert	Baghdad
Tierra del Fuego	Buenos Aires
Tigris (River)	Baghdad
Turkey	Istanbul
United Nations	New York
Volcanoes	Moroni, Tokyo
Yellow Sea	Peking

Products
Alpacca	Lima
Anjovan Scops Owl	Moroni
Art	Athens, Paris
Automobile Buyer	Tokyo
Beef	Buenos Aires
Cattle	Buenos Aires
Cobra	New Delhi
Coconuts	Colombo
Coffee Buyer	Mexico City
Copperhead	
Copra	New Delhi
Croquet	Budapest
Designer jeans	New York
Diamonds	Rio
Drama	Athens
Fashion	Paris
Fig Buyer	Istanbul
Gas Buyer	Baghdad
Gazelle	
Gila monster	Mexico City
Gorilla	Kigali
Grain	Buenos Aires
Grape Buyer	Budapest
Headhunters	Port Moresby
Headhntr artifacts	Port Moresby
King Cobra	New Delhi
Limestone	Cairo
Malayan art	Singapore
Marble	Rome
Modern Art	New York
Moslem art	Moroni
Nubian artifacts	Cairo
Nut Buyer/nuts	Istanbul
Olives	Athens
Pepper	Bangkok
Perfume Buyer	Paris
Rain Forest	Singapore
Rice	Colombo
Ship Buyer	Singapore
Silver Buyer	
Stamp Buyer/collection	San Marino
Sugar	Cairo
Tea	Colombo
Textiles	Paris
Tobacco Buyer	New Delhi
Tweed	London
Wallabies	Sydney
Whiskey	London
Wild Yaks	Bangkok
Wine	Paris
Wool	Sidney
Yacatecan jewelry	Mexico City
Yak Skins	New Delhi

Bitkey for...
Math Blaster Plus! v3.1
Davidson & Associates

Requirements:
2 blank disks (or one "flippy" disk)
Bit copy program (COPY II+)
Any fast copy program that can ignore errors (Locksmith 6.0)

The softkey provided by Jack R. Nissel in COMPUTIST ISSUE 68 did not work for my version. On version 3.1, when copying with a "standard" copy program, errors will be encountered on TRACK $22 of SIDE 1, as well as on TRACK $01 of SIDE 2, so mine must be a different version. During the short time I tried, I was not able to locate the correct sector edits, nor did the published sector edits work with Version 3.1 (ProDOS 8 V 1.4, written in FORTH). Again, that is why it is also important to provide some of the preceding and trailing "context" bytes, in order that the vital information may be found, even though it is not in the same location (program version/revision numbers will help, as well).

At any rate, the following information should allow you to make a usable backup disk (copy protection and all), so that one does not need to keep grinding the dirt into the original disk (the program performs a fair amount of disk accessing during the course of using it). More work needs to be done (primarily SIDE 2, it seems) to make it into deprotected format. When using the bit-copied MATH BLASTER PLUS! 3.1, the opening selection menu screen (only) will look slightly unconventional shortly after SIDE 2 has been accessed, but the program will be completely functional, especially to those who are fully familiar with its use. Subsequent graphic screens are nicely done, and all the functions I tested so far seem to work correctly.

Additional pseudo anti-pirating measures by Davidson include using a PRINTER SETUP menu which requires consulting the user's manual. The screen will instruct you to "See Appendix C of your manual for printer and interface categories." Printer/interface card selection is done by choosing a letter of the alphabet (A-U for printers, A-Y for interface cards), rather than having compatible printers/interface cards spelled out on the screen; trying to find the right printer/interface combination without the manual may be quite a chore — just thought I'd mention it.

More Notes: When peeking around on SIDE 2 of the original disk, you'll notice that TRACK $01, which contains the T)ext file PICTURE0 is located in the protected environment. When SIDE 2 is copied with an error-ignoring copier, that PICTURE0 file comes across to the unprotected environment virtually empty, thus the unconventional appearance of the opening screen when SIDE 2 is accessed by the program. BIT COPYING SIDE 2 also does not work, and produces a totally unusable SIDE 2. So, more work needs to be done, not only on bringing the PICTURE0 file across unscathed, but also being able to (re)format and re-write TRACK $01 on the copy disk without problems. So far, erasing and certifying only TRACK $01, and writing PICTURE0 to it intact

(first using a ProDOS utility to get PICTURE0 to the unprotected environment, then using COPY II+ 8.3 to copy PICTURE0 to SIDE 2 of the copy disk) caused COPY II+ to 'crash' and lock up with a 'C0' error (I've not seen COPY II+ crash in quite this manner before). I'm certain other crackers with more time and experience will be able to send in softkeys with easier methods for circumventing this particular copy protection.

1. WRITE-PROTECT YOUR ORIGINAL PROGRAM DISK!!!

2. Using your favorite bit copier, copy SIDE 1 with default bit copy parameters.

3. Using a copy program that can ignore errors (DO NOT BIT COPY!), copy SIDE 2 onto another disk, or onto the flipside of your notched copy disk. Ignore error on TRACK $01.

The resultant copy will work very adequately. Use it with the satisfying knowledge that your original program disk is not being subjected to constant wear and tear, especially if the disk is being used extensively in an educational environment, where many students will handle the disk.

Dan Cross _____ IA

⑦ After having hours of fun with Super.Patch for Appleworks I've got just one question: What is Slinky Ram?

Kzin Warrior _____ TX

Run Paintworks Gold on GS/OS 5.0

Search for C9 08 00 00 CE and change the $08 to a $7F. PWG is looking for a contiguous block of memory within the first 512K of the machine. The patch allows it to find the memory block anywhere within your IIGS. Also, with the growth in size of the operating system, you will need 1.5 meg to run PWG under GS/OS 5.0.

A note about *Reading & Me*

I was totally convinced that the softkey in issue #67 for Reading & Me didn't work until I checked the write protect notch of the original disk. Sure enough, it was write protected. I write protected my backup copy and it worked fine. Thanks for the softkey.

⑦ In issue 68, several letters were printed by subscribers who are unhappy with the current tabloid stock paper. Most of the complaints centered around the storage aspects and messiness of the tabloid. Has any thought been given to making the entire issue available on a 3.5 diskette? It would certainly help with the storage concerns and users could organize the information in any way they see fit.

⑦ Has anyone tried to decipher the file formats of the Stickbears Talking ABCs for the IIGS. I would like to create my own pictures and sounds for each of the letters in the alphabet. This just might be harder than writing my own program from scratch.

⑦ I have an off the wall request for the hardware hackers. I would like to see a CP/M co-processor board that utilizes a Hitachi HD64180? (the one that has a superset of the Z80 processor). I know CP/M is dead, but I still like it.

Softkey for...

Bubble Ghost IIgs

?

Behind the scenes of a One Byte Patch

When someone submits a one byte patch to RDEX, I always wonder how that person figured out the patch. I appreciate the patch being submitted to RDEX, but it does not help me get any better at deprotecting software if I don't understand how or what a patch does. If you want to know what I did to patch Bubble Ghost (BG for now on) then read on, otherwise skip to the end of the article for the one byte patch.

BG is not a copy protected program in the normal sense. It is easily copied using any disk copy program. BG employs screen identification using a hard to read non-copyable brown piece of paper as it's copy protection scheme. When you want to play the game, finding the piece of paper with the screens on it is a real nuisance, especially in my rat's nest of a computer room. So, I set out to learn a little more about my GS and remove/disable the protection method on BG.

Booting up BG, I noticed that ctrl openapple esc did not respond with the CDA menu, so I could not "Visit monitor". I guess the author did not want prying eyes examining his code. I spent a couple of hours searching through the disk with a sector editor trying to find out where the desk manager interrupt (E1/ 00A8) was. I was unsuccessful in my search, but while scanning the disk I came across the string "What level is this?". I thought I was really onto something now, because there must be a reference to that string somewhere. Disassembling the code on the disk near the reference to the string proved fruitless. Then I remembered that BG is a ProDOS 16 file and that usually means relocatable file segments. The relocatable segments are stored on the disk in such a way that the absolute address references are not resolved until the program is loaded into memory.

I don't have the ProDOS 16 or GS/OS manual (yet), but scanning through some old Call A.P.P.L.E.s (10/88 in particular), I found a series of articles by Mike Westerfield (APW, Byteworks guy) on segmentation. I don't understand

all the details of relocatable segments, but I did determine that there are five segments to the main BG file (Bubble.SYS16). The five segments to BG are main, globals, arrays, Ghost, and Dial. From another issue of Call A.P.P.L.E. (12/88), I determined that BG was written with APW C.

I did one thing that helped tremendously while I was scanning the program on disk, I copied the main file (Bubble.SYS16) to a freshly formatted disk. This caused the ProDOS block allocation to occur in a contiguous fashion. On the master BG disk, the blocks of the Bubble .SYS16 file are scattered around haphazardly to whatever free blocks were available when the master BG disk was originally created. Also, copying the file to a fresh diskette gets all the operating system files out of the way, so I could concentrate on the program itself.

Since I still couldn't visit the monitor once the program started running, I decided to place a bomb at the start of the program. I made a copy of my original disk and changed the first byte of the main segment, after the Object Module Format (OMF) header (relocation info) to a 65816 break ($00) instruction. That is a sector edit to Block $CB, byte $3C, from $80 to $00.

Booting a bomb version of BG, dropped me into the monitor after loading. Using "Memory Peeker" CDA, I determined where the memory manager had loaded BG in memory. I noticed that launching BG from finder caused BG to be spread across numerous memory banks. However, if I dropped into BASIC and entered the trusted old "PR#5" to boot the disk, BG would load neatly into memory bank 1.

Searching for "What level is this" using the monitor proved harder than I anticipated. After setting my memory bank to 1 using the "1/" command, I tried using the search ("P") command in the form '\"What"\<800.C000P', but the string would not be found. By trial and error, I discovered a command that produced the desired result '\57 68 61 74\<1/800.1/C000P'. I think that the command '\"What"\<1/800.1/C000P' should have worked, but it didn't. Could someone tell me why it wouldn't work? The search command located the string at location 01/7FC6. Next, I wanted to find references to that string, so I searched for '\C6 7F\<1/800.1/C000P', remembering that the low order byte precedes the high order byte for addresses. The pattern was found at 01/B1A8. From my previous work using the "Memory Peeker" CDA, I noticed that this code was near the beginning of the Dial segment, which started at location 01/B177. Disassembling the code showed me the following:

```
F4 CB 7F    PEA $7FCB   Push memory address
                        of "What level" string
F4 04 C6    PEA $C604   Push Quickdraw tool call
                        for DrawCString
22 00 00 E1 JSL $E10000 Call the dispatcher
```

One note about disassembling code using the monitor that I didn't know before is that the state of the m,x, and e flags of the processor status register of the 65816 effect the way in which the code is disassembled. If the m,x, and e flags are set to 1, then when the "L" command is executed, the monitor disassembles the code in 6502 emulation mode and if the m,x, and e flags are set to 0, the monitor disassembles code in the native 65816 mode. The m flag sets a 8 or 16 bit accumulator, the x flag sets 8 or 16 bit index registers, and the e flag sets emulation or native mode. It might not seem like much to the experienced programmers, but it was an important discovery for me.

BG gives you two chances to identify the level on the screen correctly or else the program hangs. I disassembled more code in the same routine until I came across a RTL instruction. I found an infinite loop near the end of the routine as shown in the following code fragment:

```
B188:E6 EE    INC $EE     Number of tries to identify
                          level
B18A:A5 EE    LDA $EE     Fetch number of tries
B18C:C9 03 00 CMP #0003   Compare against
                          maximum possible value
B18F:D0 03    BNE $B194   not last chance yet
B191:82 FF 01 BRL $B393   Jump to the infinite loop
B194:
...More code here...
B386:A5 F2    LDA $F2     Load level number
                          entered
B388:C5 FF    CMP $FF     Compare to locations
                          $FF & $00
B38A:D0 04    BNE $B390   Wrong answer this time
B38C:80 07    BRA $B395   Right answer, continue
                          with game
B38E:80 03    BRA $B393   Unreferenced instruction,
                          C compiler?
B390:82 F5 FD BRL $B188   Loop back to top, try
                          again
B393:80 FE    BRA $B393   INFINITE LOOP,
                          INFINITE LOOP, ....
B395:A8       TAY         Right answer program
                          continues on
```

So my goal was now obvious, avoid jumping to the infinite loop. I decided to patch the instruction (BNE) at $B38A to jump to location $B395 instead of $B390. Even when the incorrect level number is entered, the program jumps past the infinite loop.

The BNE (Branch if Not Equal) instruction that I patched is a relative instruction. The execution of the BNE will always causes a jump, if not equal, to be the same number of instructions away from the BNE, no matter where the program is loaded into memory. Since the area of the patch was not relying on any absolute memory locations, such as the address of the "What level is this" string, finding the pattern on the disk was easy using the Scan function of Copy II+.

The 1 byte patch

To sum it up, make a copy of BG with any disk copy program, edit block $1A9, byte 50 and change the $04 to a $09. When prompted to identify "What level is this?", just enter whatever number you like and the BG will continue on as if you answered the question correctly. If the above location is not a $04, search for $D0 04 80 07 80 03 and change the $04 to a $09.

I hope this detailed explanation helps someone out there as much as it helped me. Write to RDEX if you want to see more of this kind of article or would rather just see the one byte patch and be done with it.

Wayne Hildebrand _____ WI

Advanced Playing Technique for...

Dragon Wars

Interplay

Each character uses 2 sectors of disk space and is written backwards. To make these edits. Search your disk (side A, always use a backup) for the name of your characters. The names appear at the end of a sector. When a character is found back up 1 sector to start these edits. For example one character was found on track 0F, sector 02 so start editing on track 0F, sector 01.

Track 0F, sector 01

Bytes	value	Attribute or item
00-01	any	Dexterity
02-03	"	Intelligence
04-05	"	Spirit
06-07	"	Health Left
08-09	"	Max Health Available
0A-0B	"	Stun Left
0C-0D	"	Max Stun Available
0E-0F	"	Power Left.
10-11	"	Max Power Available
12	"	Arcane Lore
13	"	Cave Lore
14	"	Forest Lore
15	"	Mountain Lore
16	"	Town Lore
17	"	Bandage
18	"	Climb
19	"	Fistfighting
1A	"	Hiding
1B	"	Lockpick
1C	"	Pickpocket
1D	"	Swim
1E	"	Tracker
1F	"	Bureaucracy
20	"	Druid Magic
21	"	High Magic
22	"	Low Magic
23	"	Merchant
24	"	Sun Magic
25	"	Axes
26	"	Flails
27	"	Maces
28	"	Swords
29	"	Two-Handers
2A	"	Bows
2B	"	Crossbows
2C	"	Throw Weapons
2D	"	Points used to increase skills
2E-35	FF	Gives all spells
36-3D	??	?
3E		00=OK, 01=Dead, 02=Chained
3F-40	??	?
41-42	any	Level
43-46	any	Experience Points
47-4A	any	Gold
50-DF	??	?
E0-FF		Armor,Weapons,Items

Track 0F, sector 00

00-C1	??	Armor,Weapons,Items
F0-FD		Character Name
FE-FF	any	Strength

⑦ Help! In Might&Magic II, after you defeat Sheltem and his Elemental Guards, and give the password (WAFE), you get a message from Sheltem in the form of a cryptogram. Does anyone know the CODE? Please write in the answer so others can use it if need be. Thanks for a great magazine.

Sidewinder _____ IL

Bitkey for...

Gradebusters 123 v3.35

Disco Tech

Requirements:

Copy II Plus v8.4

The following bitkey should allow most owners of Gradebusters 123 to make backup copies of their program disk. The requirements are only that you must have your copy of Gradebusters 123 and COPY II +.

On 5.25" bit copy menu you will see that one of your choices in Copy II+ is CREATE NEW PARM ENTRY. This is the first thing that we will do. Choose this option and enter the following parm exactly.

```
NAME: GRADEBUSTERS 123
BY: DISCO TECH
T0-T22
SECTOR EDIT, TRACK 0, SECTOR 0A,
DOS 3.3, 1A:EA/EA/EA/EA, 2A:18/EA,
40:18/EA, A0:EA/EA, 39:01, 75:EA/
EA, 79:EA/EA, 7E:EA/EA, 82:EA/EA,
8E:B9/50/03/EA/EA
SECTOR EDIT, TRACK 0, SECTOR 0B,
DOS 3.3, 50:D5/AA/96/AA/AA/AE/AF/
AB/AA/AA/AF/AB/AB/AE/AA/AE/AE/
AB/AB/AE/AE/EB/AF/AB/AF/AB/AE/AE/
```

EE/AF/AA/BF/BA/EE/AE/BE/BE/BA/AA/ AA/AF/FB/DE/AA

Now some notes on this bitkey. The version of Gradebusters that I have working on was 3.35. The version of Copy II+ that I own is 8.4. I would dare to assume that this bitkey will work on most of the Gradebusters programs out there because it is very apparent that much time was spent in development of this copy protection scheme. At this time I only have a bitkey to offer because my time is limited as to how much work I can do on a softkey for this disk. I can say however that the copy that this bitkey will produce is very close to softkey because the copy may be copied by using only Copy II+ and selecting the sector copy portion of the 5.25" bit copy routines. Two things however that you must know if you intend to copy the copy this way. First, the original disk has it's sectors arranged on a track in such a way as to speed the boot/loading process. If you choose to copy sectors only you will loose the extra speed that this arrangement provides. Second, you will have to set copy parm number 65 to 00. This tells Copy II+ to ignore data field checksum errors. So as you can see, there isn't a whole lot of protection left.

The original disk is protected by altering the data field checksums and by verifying that a certain string of bytes that are hard to copy exists on track 1 and track 23 (yes 23). My bit key tells the program to check track 1 twice instead of checking track 1 and 23. The information that it is looking for (D5-AA-96-AA, etc.) I am hiding in track 0, sector B. Track 0, sector A and sector B are loaded into memory locations $200-$3FF respectively. This is done after boot 0 (track 0, sector 0) loads track 0, sectors 1 thru 9 into memory locations $B600 thru $BFFF. This is a image of DOS 3.3 RWTS routines. The workings of the RWTS routines are very similar to DOS 3.3 except for the changes already mentioned and the altering of the read/write translate tables to make the data on the disk appear coded.

As I mentioned earlier I have hid the information that the protection looks for on track 1 and 23 inside track 0, sector B. When the boot 0 finishes loading the RWTS routines, it loads in sectors A and B into $200-$3FF. Our changes to sector A causes the program to check track 1 but actually read the wanted information out of $350 into the buffer at $800. It then checks to see if the data in $800 is good and then proceeds with loading. The program passes thru this routine twice, once at the start of bootup, and again just before the program starts to run. It also checks every time the program asks you to turn the disk over. The protection is the same on both sides of the disk except that track 0, sector B has information that tells the program which side of the disk it is on.

I hope that this information helps some programers out there with this well done protection scheme. Looking at track 1 on your original disk with the nibble editor of Copy II+ will prove interesting to some. The subroutine at $200 (track 0, sector A) will show you how the extra zeros of auto sync bytes can be used to get data off of a disk without reading in 32 msec. loops.

George Bigelow _____ WA

Playing Tip for...

Dungeon Master

Faster Than Light

This is a great Apple IIgs game with digitized sound and pretty good animated graphics. For once a game has sound that is part of the game, in Dungeon Master the sounds that monsters make can save your life at times! It is a huge game, comprising 14 levels, and mapping is essential. Be sure to save often, and I suggest having an extra disk to save the party on at the end of a level just in case you need to start the next level again.

Here are some general suggestions, then I will proceed with a few hints for each level (I wish I had these while I was playing the game!).

I suggest that you put in the front two of the strongest heros you can find (load carrying capacity is also important, you will find that they eventually have so much armor that there is little load capability left). Then find a good Ninja that you will use with projectile weapons, and a Wizard that will cast offensive spells (and heal when necessary). Your rear characters will not get hit very often, so you do not need to load them down with the heavier armor.

You will find wands and staffs in the dungeon, be aware that these have only so many uses of their higher order spells, so be sparing of your fireballs or healings or whatever.

By using a disk search utility you can find the character levels (clear up to Arch Master) and a list of all weapons, armor, food, and items used in the game. (Search for NEOPHYTE or SWORD). I found the levels at block $159 and the list starting at block $554.

Level 1 - If a character dies bring his bones to the Altar of Rebirth to bring him back to life. There are others further down.

Level 2 - You can fill a waterskin or empty bottle from a Lion Fountain. You will find keys throughout the dungeon, but look carefully because some of them blend too well with the floor.

Level 3 - There are four gates to be opened with gold keys, you are to find all four in the rooms. I never did figure out the place marked "cast your influence, cast your might" but you can win the game without it. In the Matrix, start in the second corridor to the right, then zigzag forward and to the left until you reach an alcove with a button. The button opens a door in an alcove to your rear. Good luck on the rest of the rooms!

Level 4 - This level is a long twisty corridor that you must work your way through. You will encounter poisonous worms here, and now is a good time to learn how to use doors to help you fight a monster. Attack and back up until you are just the other side of a door. When the monster moves into the doorway press the door button to close the door. The door will try to close on them and actually help you to kill them! You will find the Teowand here, it has a Calm spell that will cause a monster to stop attacking and move away.

Level 5 - You will find a room with four puzzle rooms off it. In the force field room a wrong move will return you to the entrance of the room. If you move into the entrance (surrounded on three sides by fields) and turn right, these moves will take you to the store rooms - Forward, Right, Left, Back, Forward, Right. You are on your own on the other rooms!

Level 6 - Another long corridor, but with a puzzle to solve before you can enter it. You need a mirror, coin, bow (you get it back) and blue gem to open the door. In the room at the end of the corridor to the right, throw something across the pit, then step aside before it lands. You get the Vorpal Blade on this level, the only weapon I could find that would hit non-material beings. At "Test Your Strength" a character that is strong enough (and one of mine that was 68 was not strong enough) can throw an item hard enough to get past the field. This opens a door farther down the corridor and you get into a room with a Mithral Aketon (chest armor), two slayers (arrows), and a drumstick.

Level 7 - You get nowhere on this level until you get the other two Ra keys, which you will find on levels 9 and 12. Once you do get in, (and you can only get in once you have nearly completed level 12) you may find Stone Golems, very strong, use the door trick if you can. There are four doors opened with a turquoise key, but you will have only one. Here are the contents of these rooms so you will have some choice in the matter. Listed in the order that you first come across them:

First door - Gem of Ages, Illumulet, Sceptre of Light (can heal or light)

Second door - Dragon Spit (weapon), Boots of Speed

Third door - Crown of Nerra, magical box

Fourth door - Flame Bain (shirt), Bolt Blade

You get the winged key here in the long corridor on the opposite side of the maze from the entrance. There is a button on the left wall that opens a door back where you started in the corridor.

Level 8 - Use the Vorpal Blade or "weaken non-material beings" spell on phantoms. The skeleton key fits in the skull on the wall, this opens a door to a stairway that goes all the way down to level 14—but the only way to get into this stairway at any level is from that level with another skeleton key. This stairway is very handy since you must come back up with the Ra keys, and I have not found any other way to come back up from level 11.

Level 9 - Here is where I got stuck for a month. "When is rock not rock" means that you can walk through the wall just to the left of the sign! Once through watch out for a section of corridor that turns you around. Going down the corridor to the right of where you walk through the wall, go 3 steps after the jog in the corridor, then turn around. You should see a wall with a hook on it. This level is the last one with water, fill up (there is a fountain near the stairs down). At the sign "What is under foot is soon over head" you will have to walk over floor trips that cause wall guns to shoot at you. I found that the way through is to step on the first one and just take the shot. As long as you are on the trip it will not shoot again. You can heal and sleep in place. Check the weight of Corbomite and you will understand "Lighter than a feather".

Level 10 - At the place marked "Zooom", once you step forward you are taken on quite a ride! Click Right two or three times to get off.

Level 11 - The entrance to this level is nasty! It is just a four by four square, but the direction you travel and where you turn around determines where you are! So, by going around first one way then another you must first find a key, then a locked cell with a chest with another key in it. Returning to the square find a keyhole, then return to the cell. The back wall of the cell will be open to the rest of the maze. I have not found a way to get back to level 10 from here. Once you have picked up the Diamond Edge sword the corridor will fill with poison gas. You cannot run out of here, to do so killed me every time. You must stand and take it (healing if you need). Once the gas has dissipated you can slowly exit. Later on you will run into water monsters. I could only hit them with the Vorpal Blade, but there is another strategy to use on them. They are slow, so you can "Calm" them into retreating until you get to a section of corridor wide enough to pass them, or attack and retreat to lure them to a wider place. Then just go on by, they are too slow to follow very far. These monsters can go under doors! At the far end of this level (just past the stairs down) is a room with seven coin slots, and you will have two coins. From the first slot to the right, going counterclockwise, here's what's behind the slots: Magical box, food, cross key, two coins, magical box and Ful bomb, Ful bomb, Ven bomb.

Level 12 - Caution, there are almost invisible holes in the floor when you first enter. As you enter the room there is a click which opens the holes, just back up for another click which closes the holes. This level has knights in armor,

really tough, use the door trick to help kill them. The knight behind the topaz door is carrying the emerald key. There is a button in the second room beyond the emerald door that opens the door diagonally way across the maze (among other things there is a skeleton key there). Beware! There is a place that has a sign "Cowards will be hunted down and killed" and three doors behind which are spidery monsters. If you turn and go back all three doors open and you are chased by many of those monsters. The best thing to do is rest if you need, then open a door (all three doors go into the same room). DO NOT ENTER! If you do, this will open the other two doors. Use the door trick on these monsters, you need all the help you can get. Good luck! This is the level you find the last Ra key you need for level 7, if you continue to the end of this level you will find a skull to enter the stairway back up.

Level 13 - Here you meet Lord Chaos, but you can't defeat him yet. Just around the Flame monsters to your right is the corridor that leads to the stairs down. There is another way down if you have a skeleton key and the winged key.

Level 14 - Here lies the dragon, dangerous but slow. I defeated him by moving around to his side or rear and attacking (took a long time!). You can hear his fireball before you can see it, so if he is facing you be prepared to sidestep! However, to defeat him is not absolutely necessary to win the game, you can run faster than he. At the other end of the room (or to your left if you use the winged key) there is a door that needs a key that you can find under a pile of ashes near that end of the room. In that room is the Gem, and once you have activated the Firestaff with it, as you exit there is a click and all exits to level 12 are sealed! You must now confront Lord Chaos. Good luck, be sure to save before you try!

This is by no means a complete giveaway of the game, there is much more to each level, and different strategies to use with different monsters, but at least you have enough to help you get past some of the more difficult parts. Have fun!

⑦ I have tried to deprotect this game, but so far all I have found is that you can sector copy it with Copy II Plus, but this copy will not save a game. There is a file called "Bad Blocks" which leads to block $17 which has information in it but the block information in the data header is different from the address header. Also, in trying to find character information on the save disk, the information is coded somehow, and in trying to compare two saved games the two files are almost completely different! How do they do that? Then in changing some of the information that is the same I ran into a checksum problem (switching two bytes allowed the disk to restore a game, but changing a byte gave a "the game is damaged" message. Well, good luck to whoever takes up this challenge!

Softkey for...

The Childrens Writing and Publishing Center

The Learning Company

I have managed to deprotect "The Childrens Writing and Publishing Center", a kids desk publishing program. Following my favorite method of finding the error message that is displayed when a copied disk is booted, then finding JSR's above that and substituting EA's or BREAKs until something interesting happens I found that changing block #3D8 byte 082 to EA EA EA did the job.

James E. Bulman _____ GA

Softkey for...

Planetfall
Four-in-One Infocom Sampler

Infocom

Requirements:
COPYA A Sector Editor (I used COPY II+ 8.3)
A Blank Disk

I wanted to write to ask a question so I figured I would throw in a couple of old Softkeys. Although these programs are not listed by title in your catalog of back issues, the publisher (Infocom) is. I'm sure most of your subscribers know enough to check all the softkeys for a publisher when trying to crack a program, but some of your newer readers may not. For these programs I used the softkey for Zork III by Jack R. Nissel from Issue 51. So here goes:

1. Boot your DOS 3.3 System Disk
```
CALL-151
B925:18 60
B988:18 60
BE48:18
B8FB:29 00
RUN COPYA
```
2. Make the following sector edits to the copy you just made:

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

3. Write the change back to disk.

⑦ I recently purchased ARKANOID I. Several times (but not always) while playing the game portions of the screen contain garbage and/or additional blocks appear (some can be destroyed and some cannot) and/or "alien life-forms" shaped exactly like the "vaus" descend. This has occurred at different levels.

I called Taito's Customer Service Department and was told that it was definitely a software problem. I received a replacement disk

(after almost two months of waiting) but it does the same thing!

I use an early model Apple IIc (5.25" ROM only) with A.E.'s Z-Ram Ultra 1 (512K additional RAM). I use an Apple mouse with the game as I found the joystick to be much too sensitive.

I had a friend of mine try the game on his unenhanced IIc and it appears to work fine.

Has anybody else experienced this problem? Is there some sort of incompatibility that Taito has overlooked or do I have a hardware problem?

Gary Wills _____ Canada

Softkey for...

GBA Championship Basketball
?

Requirements:
One blank disk
Fast copier (Super IOB)
or
COPYA (with POKE 47426,24)
Sector Editor

The softkey is the same as the one in COMPUTIST #55 for Activision's Paper Models and COMPUTIST #65 for Rampage. The standard Activision protection.

1. Copy the disk •

2. Search for A9 56 85 FD A9 ... 38 2A 25 FC (The "..." means all of the bytes in between.) and change to EA EA EA ... EA A9 FF. I found the code on track $00, sector $0A, byte $58 through $95.

Ricky Lee Wallace _____ TX

Rick's Hello

RICK'S HELLO is a simple solution to my own need for a DOS program that I could boot into that would provide a menu and require entering only the program name to launch into it. This is nothing fancy, but it works. Here's a brief description.

Line 10: Sets 80-column display. A personal preference.

Line 20: Prints the menu.

Line 30: First of two error traps used to distinguish file types.

Line 40-70: Prompts you to enter the name, defines a string, waits for input and then attempts to simply "RUN" the program. If the program happens to be a binary or text file it will be handled by an error trap. Misspelled names and parameter mistakes are also handled.

Line 500: Checks memory location 222 for the DOS error code that signals the use of incorrect file type for DOS command entry. Since it had been "RUN", that means it's either a binary or a text file. Program flow is directed to line 600 for error correction.

Line 505: Checks location 222 for the error code for the "FILE NOT FOUND" error. If that was the problem, it prompts you to enter the name again and returns program flow to line 50 for that input.

Line 508: Checks for the error code that signals the use of an incorrect parameter. Prompts you to be more careful and again returns program flow to line 50 for the new input.

Line 600-700: This handles the FILE TYPE MISMATCH error. The poke statement cancels the first "ONERR" statement. B$ is redefined to the BRUN command, and a new error handling location is defined. The program then attempts to BRUN the file.

Line 1000: This is where the program ends up if it was a text file that could be executed. B$ is redefined and the file is EXECuted.

⑦ Can anyone give me some info on the built in mouse handling routines in ROM? I know they are located at $C400 -> $C4FF along with the interrupt handling routines. I'd like to write some software utilizing the mouse and I really don't know where to start. I'm using a Laser 128, but the firmware would have to duplicate the //E's.

RICK'S HELLO

```
10 PRINT CHR$ (4); "PR#3"
20 PRINT CHR$ (4); "CATALOG"
30 ONERR GOTO 500
40 PRINT "Enter◊program◊name◊to
    ◊run."
45 B$ = "RUN"
50 INPUT A$
60 PRINT CHR$ (4);B$;A$
70 END
500 IF PEEK (222) = 13 THEN GOTO
    600
505 IF PEEK (222) = 6 THEN PRINT
    "Wrong◊name!!◊Try◊again." : GOTO
    50
508 IF PEEK (222) = 11 THEN PRINT
    "Incorrect◊parameter◊or◊form!◊BE◊
    more◊CAREFULL◊&◊enter◊name◊AGAIN
    !!" : GOTO 50
600 POKE 216,0:B$ = "B" + B$:
    ONERR GOTO 1000
700 PRINT CHR$ (4);B$;A$
1000 B$ = "EXEC" : PRINT CHR$ (4)
    ;B$;A$
```

Checksums

10-$99BE	50-$409E	508-$E13C
20-$8C25	60-$80C8	600-$0AE9
30-$805E	70-$70FF	700-$3A5A
40-$7EE1	500-$0D1F	1000-$DE44
45-$4200	505-$C6D1	

Sang Jin Hong _____ PA

I've just started subscribing to COMPUTIST. In fact, I've just come to this country. I've been using an Apple IIe for 5 years in Korea where I heard about COMPUTIST. I read a copy of Computist. It was good, so when I came here, I subscribed.

And here is my first softkey to COMPUTIST. When I found it, I thought it might work for all software made by Quicksilver, like Victory Road, Platoon, Heavy Barrel, etc. Those programs are better than before (Ikari Warriors, Commando, etc) with good graphics, using double hi-res, and more stages. But they don't have scrolling and they should be better. Anyway, those programs are pretty good. I tested the softkey on Platoon and Heavy Barrel. I couldn't test on Victory Road. But I think it will work.

Softkey for...

Platoon
Heavy Barrel

Quicksilver

When I copied with a normal copy program (Locksmith Fastcopy), the copy didn't boot pass track $00. I searched track $00 (using Copy][Plus 8.2) and found a check routine on sector $0E. When the check fails, it makes the disk reboot with a JMP $C600 (4C 00 C6), so I changed the JMP to EA EA EA.

1. Copy both sides of the disk with a normal copy program, like COPYA or Locksmith Fastcopy.

2. Sector edit side A.

Trk	Sct	Byte	From	To
$00	$0E	$4A-4C	4C 00 C6	EA EA EA

⑦ Where can I get a 65C802?

Jameco Electronics sells the 65C802 for $15.95, however, their minimum order is $25 so you will need to order something else to bring up the total amount. Their address is: 1355 Shoreway Road, Belmont, CA 94002. They take charge card orders at (415) 592-8097. ....RDEXed

⑦ On page 4 of #67. It says if I install a Modified CD ROM on the mother board, then I can change the open apple ctrl reset vector to point to the monitor. How can I change it? I mean where? Or should I buy a modified CD ROM from someone? I have a ROM writer.

Joseph P. Karwoski _____ PA

Softkey for...

How the West was One + Three x Four

Sunburst

Requirements:
A way into the monitor - I used my IIgs with the "visit monitor" option from the control panel.
Super IOB
Swap controller
Blank disk

How the West was One + Three x Four by Sunburst is great for younger children. It teaches them to add, subtract, multiply, and divide. But this is not a review, so on with the softkey.

1. Boot the disk. When the disk stops spinning, jump into the monitor.

2. Move the RWTS to a safe place - someplace where you can boot a normal disk without destroying the RWTS. I used:
1900<B800.BFFFM

3. I then booted my disk that contained my Super IOB and my swap controller. I stopped the HELLO program by using ctrl C, before it had a chance to execute. I booted the disk with C600G.

4. BSAVE the RWTS to be used in the swap controller.
BSAVE RWTS.HOW,A$1900,L$800

5. I loaded the swap controller and changed line 10010 to BLOAD RWTS.HOW - don't forget to save this too!

6. I then re-booted my disk with Super IOB, swap controller, and the RWTS.HOW file.

7. Merge the swap controller and Super IOB, and then copy the program.

8. I then used Copy II+ to put a fast DOS on the disk. If you don't have a fast DOS, a normal DOS 3.3 will work - it will just load slower.

You are now done, and you can have the children work with the program without fear of it being destroyed - you now have a back-up!

Softkey for...

Where in North Dakota is Carmen Sandiego

Broderbund

Requirements:
Copy II+
Blank disk - you will need 2 sides

This game was developed for the Dept of Education in North Dakota by a group of educators and Broderbund - they did a great job! I think every state should get together with Broderbund and have them do a game like this for their Dept of Education, it is a fantastic learning tool!

I was surprised to see that I could copy the disk with Copy II+ using the Disk/w format option. Of course, the disk would not boot - no surprise. I needed someplace to start, so I booted a normal DOS disk and tried to CATALOG the disk. I got a peek of something that was interest-

ing, just before my computer "went crazy". It looked like it said "PROLOK" at the top of the screen. This told me that "at least" one of the protections used was the PROLOK method. There is a very good article on the PROLOK method in issue 60 by Stephen Lau. I then searched the disk for the bytes: A0 07 BD 8C C0 10. I found these on track 00, sector 06. Here is the softkey:

1. Copy the original to the blank disk - I used the Disk/w format option from Copy II+. You will get NO errors. Side B is not protected.

2. Using the sector editor, make the following edits:

Trk	Sct	Byte	From	To
0	6	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-	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

Your done! Enjoy the game without fear. I did not find any other protection on this disk.

For the people who are interested, I will try to explain what all of this is doing. Following, you will find a listing of the original code and the new code, as seen from the sector editor of Copy II+.

Original code:

```
0E2B:8D 8C C0   LDA C08C,X   read a byte
0E2E:10 FB      BPL 0E2B (-05) branch on high bit clr
0E30:88         DEY          decrease Y register by 1
0E31:F0 65      BEQ 0E98 (+65) if enough - go bomb
0E33:C9 D5      CMP #D5      find data header
0E35:D0 F4      BNE 0E2B (-0C) if not, re-read
0E37:A0 00      LDY #00
0E39:BD 8C C0   LDA C08C,X
0E3C:10 FB      BPL 0E39 (-05)
0E3E:88         DEY
0E3F:F0 57      BEQ 0E98 (+57) if enough - go bomb
0E41:C9 E7      CMP #E7      find first E7
0E43:D0 F4      BNE 0E39 (-0C) if not, re-read
0E45:BD 8C C0   LDA C08C,X   read second byte
0E48:10 FB      BPL 0E45 (-05)
0E4A:C9 E7      CMP #E7      should find E7
0E4C:D0 4A      BNE 0E98 (+4A) if not E7 - go bomb
0E4E:BD 8C C0   LDA C08C,X   read third byte
0E51:10 FB      BPL 0E4E (-05)
0E53:C9 E7      CMP #E7      should find E7
0E55:D0 41      BNE 0E98 (+41) if not E7 - go bomb
0E57:BD 8C C0   LDA C08C,X   clear the latch
0E5A:A0 10      LDA #10
0E5C:24 80      BIT 80       compare acc and mem
0E5E:BD 8C C0   LDA C08C,X
0E61:10 FB      BPL 0E5E (-05)
0E63:88         DEY
0E64:F0 32      BEQ 0E98 (+32) if tried enough -bomb
0E66:C9 EE      CMP #EE      should find EE
0E68:D0 F4      BNE 0E5E (-0C) if not, re-read
0E6A:EA         NOP
0E6B:EA         NOP
0E6C:A0 07      LDY #07
0E6E:BD 8C C0   LDA C08C,X
0E71:10 FB      BPL 0E6E (-05)
0E73:99 F0 00   STA 00F0,Y
0E76:EA         NOP
0E77:88         DEY
0E78:10 F4      BPL 0E6E (-0C)
continue program
```

New Code:

```
0E2B:8D 8C C0   LDA C08C,X   read a byte
0E2E:10 FB      BPL 0E2B (-05) branch on high bit clr
0E30:88         DEY          decrease Y register by 1
0E31:F0 65      BEQ 0E98 (+65) if tried enough-bomb
0E33:C9 D5      CMP #D5      find data header
0E35:D0 F4      BNE 0E2B (-0C) if not, re-read
0E37:A0 00      LDY #00
0E39:BD 8C C0   LDA C08C,X
0E3C:10 FB      BPL 0E39 (-05)
0E3E:88         DEY
0E3F:F0 57      BEQ 0E98 (+57) if tried enough- bomb
0E41:C9 E7      CMP #E7      find first E7
0E43:EA EA      NOP NOP      do nothing *1
0E45:BD 8C C0   LDA C08C,X   read second byte
0E48:10 FB      BPL 0E45 (-05)
0E4A:C9 E7      CMP #E7      should find E7
0E4C:EA EA      NOP NOP      do nothing *2
0E4E:BD 8C C0   LDA C08C,X   read third byte
0E51:10 FB      BPL 0E4E (-05)
0E53:C9 E7      CMP #E7      should find E7
0E55:EA EA      NOP          do nothing *3
0E56:EA         NOP
0E57:BD 8C C0   LDA C08C,X   clear the latch
0E5A:A0 10      LDA #10
0E5C:24 80      BIT 80       compare acc and mem
0E5E:BD 8C C0   LDA C08C,X
0E61:10 FB      BPL 0E5E (-05)
0E63:88         DEY
0E64:F0 32      BEQ 0E98 (+32) if tried enough-bomb
0E66:C9 EE      CMP #EE      should find EE
0E68:EA         NOP
0E69:EA         NOP          do nothing *4
0E6A:EA         NOP
0E6B:EA         NOP
0E6C:EA         NOP
0E6D:EA         NOP          do nothing *5
0E6E:A9 FC      LDA #FC
0E70:85 F0      STA F0
0E72:85 F3      STA F3
0E74:A9 EE      LDA #EE
0E76:85 F1      STA F1
0E78:85 F2      STA F2
continue program
```

The protection works like this:Read information off the disk. Find the beginning of the header and then read from there. If the program does not find the beginning of the header in a certain number of tries, go BOMB. After it finds this on the disk, the program begins to look for E7. If it does not find it, it will re-read until it has read enough - then it goes to the BOMB. After it finds the first E7, it reads again. This time, if it does not

find E7 it will go and BOMB. This is the main idea of this protection.

What the new code will do is this: Go ahead and read the header. Go read another byte, but don't compare it to E7. Read another byte, and again - don't compare it to E7. Read again, but don't keep reading until 0E64 is true. Then we load the accumulator (A register) with FC and store it, load the acc with EE and store that. Then continue with the program.

I hope this will help some of you with the PROLOK method of protection. Maybe it will even help some of you with understanding other protection schemes.

George Sabeh _____ PA

I would like to share a softkey and a collection of APTs with your readers. I have been able to develop some of these APTs at the urging of a friend and fellow Computist. I have not checked back issues of Computist to see if some of these were published previously. I would like to apologize to anyone who may have contributed a similar APT, and will send the rest of my APTs at a future date.

Softkey for...

Sokoban
Spectrum Holobyte

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

POKE 47426,24
RUN COPYA

3. Make the following sector edits to side 1 of the copy.

Trk	Sct	Byte	From	To
00	05	12	A6 2B BD 89 C0	A6 2B BD A9 E7 85
			BD 8E C0 A9 80	F8 A9 FC 85 F9
			85 FD C6 F0 F0	A9 EE 85 FA A9
			71 20 AF F0 B0	E7 85 FB A9 FC
			6C A5 F9 C9 00	85 FC A9 EE 85
			D0 F1 A0 00 BD	FD 85 FE A9 4C
			8C C0 10 FB 88	7C F0 FC 85 FF

Write the sector back to disk.

Advanced Playing Techniques

The following APTs will be listed as a string to search for since there are many cracked versions of some of these programs. This is true when some of these cracked programs are in a binary file format and the edits change from one version to another.

Beer Run—Sirius
Scan for D4 62 A9 03 8D 1F 62 and change the 03 to xx, where "xx" is the number of men wanted.

Money Munchers—Datamost
Scan for 1A A9 02 8D 02 03 and change the A9 02 to A9 xx, where the xx represents the number of men wanted.

Teleport—Cavalier
Scan for 49 42 CE 14 41 AD 14 and change to 49 42 EA EA EA AD 14 for unlimited lives.

Mars Cars—Datamost
Scan for 25 71 A9 03 8D 80 and change the 03 to the number of cars desired.

Jawbreaker II—Sierra
Scan for 85 9A A9 03 85 8A and change the 03 to the desired number of lives.

Jouster—?
Scan for A7 2C A9 03 8D 51 and change the 03 to the number of lives.

Pooyan—Datasoft
Scan for A0 01 A9 04 A6 A3 and change the 04 to the number of lives desired.

Evolution—Sydney
Scan for 85 15 A9 05 85 16 and change the 05 to the number of lives wanted.

Spys Demise—Penguin
Scan for 10 CD A9 05 85 27 and change the 05 to the number of lives wanted.

Gold Rush—Sentient
Scan for 54 14 A9 03 8D 33 and change the 03 to the number of lives.

Snack Attack—Datamost
Scan for 1D A9 03 85 EA and change the 03 to the number of lives.

Swashbuckler—Datamost
Scan for 10 60 A9 03 8D C2 and change the 03 to the number of pirates wanted.

Apple Panic—Broderbund
Scan for 74 18 CE 2E 72 20 and change to 74 18 EA EA EA 20 for unlimited lives.

Buzzard Bait—Sirius
Scan for A7 09 A9 03 85 40 and change the 03 to the number of lives.

Cannonball Blitz—Sierra
Scan for 6B 12 A9 02 8D 12 and change the 02 to the number of lives. Maximum is 7F.

Sammy Lightfoot—Sierra
Scan for 96 A9 03 8D 4E and change the 03 to the number of lives. Also Scan for A7 14 00 00 00 and change the first 00 to the level desired. Maximum is 0B.

Ice Demons—Morningstar
Scan for 10 FB A9 05 8D ED and change the 05 to the number of lives.

Halloween—Microsparc
Scan for 85 80 A2 04 8E F6 and change the 04 to the number of lives.

Sea Fox—Broderbund
Scan for 7F 66 A9 03 8D C3 and change the 03 to the number of lives.

Star Thief—Cavalier
Scan for 10 FA A9 08 8D 3B and change the 08 to the number of lives.

Millipeed—?
Scan for 85 55 A9 03 85 54 and change the 03 to the number of lives.

Ribbit—Picadilly
Scan for D0 0D A9 03 8D 1C and change the 03 to the number of frogs wanted.

Free Fall—Sirius
Scan for B6 77 A9 03 8D 32 and change the 03 to the number of lives.

Snapper—Silicon Valley Systems
Scan for 85 E7 A9 03 85 DA and change the 03 to the number of lives.

Wargle—Hayden
Scan for 38 68 A9 05 85 16 and change the 05 to the number of lives.

Eliminator—Adventure International
Scan for 19 A9 03 8D 02 12 and change the 03 to the number of lives.

Mr Cool—Sierra
Scan for E3 5C A9 03 8D BC and change the 03 to the number of lives.

Jumpman—Epyx
Scan for A2 04 A9 06 CA 9D and change the 06 to the number of lives. Should scan both sides of disk since it can be booted from side 2.

Crossfire—Sierra
Scan for A0 B4 A9 03 8D 16 and change the 03 to the number of lives.

Fire and Ice—?
Scan for 85 66 A9 02 85 6F and change the 02 to the number of lives wanted.

Genetic Drift—Broderbund
Scan for 85 2E A9 03 85 10 and change the 03 to the number of lives wanted.

Canyon Climber—Datasoft
Scan for 85 B1 A9 03 85 DF and change the 03 to the number of lives.

Neptune—Gebelli
Scan for 85 86 A9 04 85 87 and change the 04 to the number of lives.

Space Quarks—Broderbund
Scan for 85 8E A9 03 85 BC and change the 03 to the number of lives.

Night Crawler—?
Scan for 85 1A A9 03 8D FC and change the 03 to the number of lives.

Snake Byte—Sirius
Scan for 55 72 A9 02 8D 5E and change the 02 to the number of snakes wanted.

Falcons—Picadilly
Scan for FF 04 A9 03 8D FC and change the 03 to the number of lives.

Serpentine—Broderbund
Scan for 85 CE A9 03 85 D8 and change the 03 to the number of serpents.

Tubeway II—Datamost
Scan for 11 60 A9 03 85 A3 and change the 03 to the number of lives.

Hellstrom—?
Scan for CF 63 A9 03 8D 88 and change the 03 to the number of lives.

Thunderbombs—Penguin
Scan for 57 09 A9 04 8D 00 03 and change the 04 to the number of lives wanted.

Caverns of Callsto—Origin
Scan for 85 90 A9 04 85 8A and change the 04 to the number of lives.

Crystal Castles—?
Scan for 85 F7 A9 02 85 54 and change the 02 to the number of lives.

Oils Well—Sierra
Scan for 28 02 A9 03 8D 25 and change the 03 to the number of lives.

Electro Arena—?
Scan for 85 7B A9 03 85 63 and change the 03 to the number of lives.

Michael Warren _____ IL

The following playing tips are offered for anyone who may be interested. Some are old, some are new, but all of them are useful. Some of the information contained in the tips I discovered for myself, other tips I have gotten from my son, other players, BBS's, or magazines.

Playing Tip for...

Bard's Tale I
Electronic Arts

1. To enter Kylearan's tower, place the eye in the statue on the top level of the Castle. You will be teleported to the front of the tower.

2. To enter Mangar's tower you need the Onyx key which lets you use the staircase in the sewers.

3. You can get at least 50,000 experience points for each party member if you go into the castle and teleport, from the entrance to 5 North, 12 East, and 2 Up. You will fight 4 groups of 99 berserkers, if you survive you get the points.

4. The password to enter the dungeon in the Mad God's Temple is "TARJAN".

Item Locations
1. The Eye- 19 North, 20 East, 2 Down in the catacombs.
2. The Crystal Sword- 0 North, 19 East, 0 Down, in the castle.
3. The Silver Square- 0 North, 0 East, 1 Up in the castle.
4. The Silver Triangle- 20 North, 2 East, 0 Down, in Kylearan's tower.
5. The Silver Circle- 15 North, 4 East, 1 Up, in Mangar's tower.
6. The Onyx Key- 13 North, 17 East, 1 Up, in Kylearan's tower.

Playing Tip for...
Wizardry (Proving Grounds of the Mad Overlord)
Sir-Tech

Make a bishop, then enter the Proving Grounds and have him identify item "9" or item "S" or item "J". You will love what happens. It may take more than one attempt so keep trying.

Playing Tip for...
Neuromancer
Interplay

Bank of Zurich and Justice System require the use of special software ("Sequencer") to enter. In many cases the only way to enter the higher security areas of the boards is through "Cyberspace". There are many other boards that can only be entered from Cyberspace.

1. Don't sell body parts if you can avoid it, there are other ways of making money. If you have to sell body parts do not allow your constitution to go below 1400 or you will have a very difficult time surviving in cyberspace combat against the more powerful AI's.
2. Need a quick $10,000? Join up with Armitage.
3. Still not enough money? Get a job!!
4. Still greedy? Rob a Bank!!
5. Having trouble getting in to see the Panther Moderns? Is Larry Moe a pain in your skill chip? Have him arrested!
6. Good Ice Breakers: Decoder, Blowtorch, and Hammer.
Better Ice Breakers: Doorstop and Drill.
Best Ice Breakers: Concrete, Depthcharge, and Logic Bomb.
7. Best Viruses: Python and Thunderhead.
8. Is the ICE giving you frostbite? Try a little "Armor"!
9. Want to know what your getting into before you try to break in? Try "Probe"!
10. Nothing is "Free"!!
11. Remember! Save games frequently, read all messages on the boards for clues and buy the best possible cyberdeck you can. I recommend the "Samurai Seven".

Playing Tip for...
Dungeon Master
FTL Games

This is one of the most challenging games for the GS that I have ever played. The graphics are superb! I recommend it highly to anyone who enjoys fantasy role-playing. The following information I gained by myself after many hours of play and experimentation. Hopefully it will make the game a little easier for the rest of you.

P.S. Anyone out there with a softkey for this game, a mapping utility or just more hints please send them in.

Casting spells

Casting spells in Dungeon Master requires the use of four sets of symbols. The four groups are: Power, Element, Form and Alignment. There are six symbols within each group. By combining the various symbols different spells may be cast. The following is a list of the spell combinations I have deciphered. I used the Power symbol "LO" in each one to simplify the chart.

Wizard Spells

LO + FUL	= light
LO + ZO	= open doors
LO + FUL + IR	= fireball
LO + OH + VEN	= poison gas
LO + DES + VEN	= poison spray
LO + DES + EW	= weakness
LO + OH + EW + RA	= unknown effect
LO + OH + EW + SAR	= unknown effect
LO + OH + KATH + RA	= lightning
LO + OH + IR + RA	= strong light
LO + OH + IR + SAR	= darkness
LO + ZO + KATH + RA	= item, use unknown

Priest Spells
(All spells except Footprints and Protection require a flask)

LO + YA	= stamina potion
LO + VI	= healing potion
LO + YA + IR	= protection from ?
LO + YA + BRO	= shield potion
LO + VI + BRO	= neutralize poison
LO + ZO + ZEN	= unknown effect
LO + YA + BRO + ROS	= magic footprints
LO + YA + BRO + NETA	= skill potion
LO + OH + BRO + ROS	= skill potion
LO + FUL + BRO + KU	= skill potion
LO + FUL + BRO + NETA	= protection from fire
LO + ZO + BRO + RA	= mana potion

Ability
The first 8 levels of ability are as follows:

Neophyte
Novice
Apprentice
Journeyman

Craftsman
Artisan
Adept
Expert

Points to Remember

It is very important to pay close attention to the floor and walls otherwise you may overlook items, buttons, levers or messages. For this reason bright illumination is a necessity. Equally important is examining, with the cursor "Hand", anything that looks unusual. Keep track of your food and water supply, unless you like starving or dying of thirst.

Tactics

Be cautious in your encounters, especially with monsters you have never met before. Always leave yourself an escape path. As the saying goes it is sometimes better to "Fight then run away and live to fight another day". In fact, a retreating battle will often tip the odds in your favor if you have sufficient missile weapons and spell points. Try to have a few healing potions and neutralize poison potions with you to get you out of bad spots. There is nothing worse than having one or two dead characters on your hands and having to haul their bones across a level and up one or two to the closest Temple to revive them. Frequent game saves also help to avoid this irritating situation. Unfortunately, you can only save one game on the disk so you may want to make several save disks. That way you can have several game positions available in case you discover you have missed something vital. There are many tricks and puzzles in the game. Be systematic in your approach to them, take notes of what solutions you have tried and remember that sometimes the most obvious solution is the correct one.

Maps

Accurate maps are a must in this game! I know how tedious mapping can be but success depends on them. It is unfortunate that FTL Games did not see fit to include Auto-mapping in this program for it would have greatly enhanced the entertainment value of an otherwise excellent product.

Don Westcott   CO

These IIgs softkeys were derived from my brother's Apple Link. This service offers many useful and entertaining contributions. I am in the market for a modem now so I can get it too. I used Copy II plus v 8.2 to copy these disks and perform the sector edits.

Softkey for...

Battle Chess GS

Interplay

This one is from "Cheezer". The Battle Chess disk isn't directly copy-protected. The protection is looking up a chess move from Appendix A of the manual. This fix allows you to enter anything and begin playing.

1. Copy the disk.
2. Search for 80 0C C2 30 C6 0C F0 03 4C 24 AB 4C 76 BD on the copy (I found it in Block $417) and change it to EA EA C2 30 C6 0C EA EA EA EA EA EA EA EA.

Softkey for...

Bubble Ghost GS

Accolade

This one is from "Anon". The Bubble Ghost disk isn't directly protected either. It's protection is matching a room displayed on the screen with one from an unreadable sheet of brown paper. The download file I got this from said the byte sequences are in Block $17A. On my version it was in Block $17C so you may need to search.

1. Copy the disk.
2. Do these sector edits to the copy:

Blk	Byte	From	To
17C	174-178	AD 00 00 F0 2E	9C 00 00 80 2E
	1A2-1A5	22 00 00 00 00	AF 00 00 00 00

Softkey for...

The Duel: Test Drive II GS

Accolade

This one is from "Static Vengeance".

1. Copy the disk.
2. Do these sector edits to the copy:

Blk	Byte	From	To
$169	19B-19E	22 E3 C4 03	AF E3 C4 03
	1F3-1F6	22 E3 C4 03	AF E3 C4 03
$191	1D8-1DB	22 E3 C4 03	AF E3 C4 03
$199	125-128	F0 16 F4 01	80 16 F4 01

The following two APT's were derived from BASIC programs also from Apple Link. I sent them to RDEX some months ago and as of Computist #69 they had not been published yet. I stated that they didn't work on my versions.

Since then I decided to look at the listings to see what was being attempted. I don't know why the programs didn't work but making the contained sector edits with Copy II plus did work!

Advanced Playing Technique for...

Warlock GS

Three-Sixty

This one is from "Anon". This A.P.T. gives you unlimited vitality. The program this came from tried to load the file WARLOCK.SYS16, alter it and rewrite it. I did it this way:

1. Copy the disk. Apparently it isn't protected.
2. Do these sector edits to the copy:

Blk	Byte	From	To
$114	DC-DF	ED 23 01 8D	AD 23 01 AD
	17F-182	ED 21 01 8D	AD 21 01 AD
	1DC-1DF	ED F9 00 8D	AD F9 00 AD

Advanced Playing Technique for...

Zany Golf GS

Electronic Arts

This one is from "Anon". This A.P.T. gives you unlimited strokes. The program this came from tried to load the file CODE, alter it and rewrite it. I did it this way:

1. Copy the disk and deprotect it. I used the softkey in Computist #63, page 26.
2. Do these sector edits to the copy:

Blk	Byte	From	To
$64	181-183	9D 4E 42	EA EA EA
	193-195	9D 4E 42	EA EA EA
$67	1C2-1C4	9D 4E 42	EA EA EA
$6E	15D-15F	9D 4E 42	EA EA EA

Note on Bilestoad

I noticed "The Bilestoad" is on the Most Wanted List in Computist #69. The unprotected files for this game are in Softdisk #84.

The Dark Phoenix   UT

The APT info submitted by Dark Phoenix was the same as Les B. Minaker's in issue #59, pp13-15, so I decided not to print it. Here is the rest of the letter. ...RDEXed

Playing Tip for...

Ultima V

Origin

Helps, Hints, and How-To's

In order to complete Ultima V you must do the following:

Obtain all three shards from the Underworld. (They are in the most obious spots that anyone could find.)

Use the shards to destroy the most annoying Shadowlords. To do this, go to the castle opposite of the virtue. (Truth/Falsehood, Love/Hatred, Courage/Coudarice, etc.) Get directly in front of the flame and yell the name of the Shadowlord, then pass a turn till its directly on the flame. Then throw the shard into the fire thus destroying the Shadowlord.

Retrieve the Lord British items. The Scepter is in Stonegate, you'll need the Flying Carpet to get over the traps falling into the Stygen Abyss. You get the Magic Carpet from Lord British's

room atop his castle. Blow down the door using the Cannon. Don't go up the ladder. Then while you are up there, play the tune on the Harpsicord. Get the sandlewood box and then leave. The Amulet is in the underworld and the Crown in a room atop Blacktorns castle.

Be level eight with 6,400 experience (just edit it).

Quests

Go to each Shrine, meditate, get your quest and go to the Codex. Do this for all 8 shrines.

When you are done Lord British will come to you and say something like, "Thou hast been armed and ready".

Do what the Codex says, and on the eighth level there is a room, look in the mirror.

The mystical weapons are in the underworld at (E9,E9). (Use ctrl-2 or ctrl shift 2.)

Other Important Info

Virtue	Mantra	Word of Power	Dungeon
Honesty	AHM	FALLAX	DECIET
Compassion	MU	VILIS	DISPISE
Valor	RA	INOPIA	DESTARD
Justice	BEH	MALUM	WRONG
Sacrifice	CAH	AVIDUS	(UNKNOWN)
Honor	SUMM	INFAMA	SHAME
Spirituality	OM	IGNAVUS	(UNKNOWN)
Humility	LUMM	VERAMOCOR	(UNKNOWN)

Tune

678-987-8767653

Shadowlords

Falsehood	Faulinei
Haterid	Astaroth
Cowardice	Nosfentor

Runes

Found in any encyclopedia.
Found in most unabridged dictionary.

⑦I have not found a way, to keep the display from messing up when I cheat up the shards, and I can't cheat virtues. If you know how, write to me in C/O the RDEX editor.

Frank M Polosky   PA

This RDEX submission was one of the hardest files to edit. All of the text was uppercase and there was no common format. It looked like it had been downloaded from a BBS in several pieces. I did the best I could to make it readable even though some of the info didn't make any sense to me. I hope it reads OK to you. .....RDEXed

Labyrinth

Press 'esc K A Y' (all at the same time) and press a number (1-8) to go to that level or press 9 to get more ships.

A.E.

EE1:x	where x=# of ships
7FDG	

Alien Ambush

BLOAD ALIEN AMBUSH
CALL-151

60E9:x	where x=# of ships
4000G	start game

Alien Game

8550:x	where x is a number
C050 C057 C054	
800G	

Apple Kong

43F5:EA EA	
C050 C057 C054	
4000G	

Battle Zone

MAXFILES1
BLOAD BALLTLE ZONE
CALL -151

98A:x	where x=number of tanks
810G	

Beer Run

BLOAD BEER RUN
CALL-151

C64:x	where x=# of men
800G	start game

Bellhop

6A92:x	where x=# of men

Berserker

6179:EA EA EA
1F00G

Bolo

14A8:EA EA
1D3D:EA EA

Borg

Try pressing **shift-ctrl-M-N** while you are playing.

Bruce Lee

For unlimited men:

Trk	Sct	Byte	From	To
04	02	7E	CE 2A 90 10	EA EA EA EA
			08 CE 29 90	EA EA EA EA
			09	A9 04

Buck Rogers

For Unlimited ships:
ctrl K E N   *All four keys at once*
Tip: stay high and never stop your firing, even if the screen is blank, keep firing!

Bug Attack

BLOAD BUG ATTACK
CALL-151

49D1:x	where x=# of beetles
8FDG	start game

Cannonball Blitz

BLOAD CANNONBALL BLITZ

CALL -151
8F76:A0 01

868C:x	where x=# of guys
7FDG	

Cannonball Blitz (Alternate)

BLOAD CANNONBALL BLITZ

POKE 34444,x	where x=# of men
CALL 4093	starts game

Canyon Climber

2600:x	where x=# of men
2000G	(Sam's ver)
3300:x	where x=# of men
2000G	(87 Sctr ver)

Canyon Climber

BLOAD CANYON CLIMBER
35C2:EA EA

Ceiling Zero

356B:09	
1EC0G	(Short ver)

Choplifter

Press **ctrl L** then press # of level to go to.

Color Planetoids

BLOAD COLOR PLANETOIDS
CALL-151

9B7:x	where x=# of ships
803G	

Congo

5227:EA EA EA
BF4G

Creepy Corridors

reset	into the monitor
86A:x	where x=# of guys
800G	

Crisis Mountain

13E5:00	Bonus time does not count down
875:00	
13C2:00	Makes you immortal as long as you stay away from bats and lava pits
DCC:x	where x=# of men
C050 C057	select Hires screen
1C33G	To start game

Cyclod

8025:EA EA EA
900G

Diamond Mine

BLOAD DIAMOND MINE   *or Boot up*
CALL -151
708E:60
7FDG

Diamond Mine

The passwords to access the lower levels are:
RKS
QEZ
GEM
WTH
EME
FUN

Dig Dug

BLOAD DIG DUG   *or boot up*
CALL -151
61DB:EA EA
61DF:EA EA
1F50G

Dig Dug (other)

5BAF:EA EA EA EA EA

Dig 'Em

6EAB:FF
6D87:EA EA EA
5BD1:EA EA EA
5808G

Donkey Kong

While playing, type "1" for more men. If you are tired of being killed then type a "2" for an invincible Mario!

Drelbs

BLOAD DRELBS
CALL -151

1CB0:EA EA	unlimited men
19A2:60 60 60 60 60 60 60 60 60	indestructible Drelb
C00G	

Dungeon Master Characters

This chart lists the names, skill levels and attributes of the pregenerated characters that are available in the Hall of Champions. This should enable you to choose characters more easily.

Name	Ftr	Nin	Prst	Wiz	Hlth	Stam	Mana	Str	Dex	Wis	Vit	Mr	Fr
Leyla	Jmn	.	.	.	48	60	3	40	53	45	47	45	35
Wu Tse	Nov	App	.	45	47	20	38	35	53	45	47	40	
Mophus	.	.	Jmn	.	55	55	19	42	35	40	48	40	45
Wuuf	.	App	Nov	.	40	50	30	33	57	45	40	35	40
Boris	.	Nov	.	App	35	65	28	35	45	55	40	45	40
Alex	.	Nov	.	App	50	57	13	44	55	45	40	35	40
Tiggy	.	Nov	.	App	25	45	36	30	45	50	35	59	40
Syra	.	.	Nov	App	53	72	15	38	35	43	45	43	40
Gothmog	.	.	.	Jmn	60	55	18	40	43	48	34	50	59
Gand	.	App	.	Nov	39	63	26	39	45	47	33	48	43
Nabi	.	.	App	Nov	55	65	13	41	36	45	45	55	55
Hisssssa	App	Nov	.	.	80	65	13	58	48	35	45	43	55
Iaido	App	.	.	Nov	48	65	11	43	55	40	35	45	50
Leif	App	.	Nov	.	75	70	7	46	40	39	50	45	45
Linflas	App	.	.	Nov	65	50	12	45	45	47	35	50	35
Daroou	App	.	.	Neo	100	65	6	50	30	45	45	30	45
Halk	Jmn	.	.	.	90	75	0	55	43	30	46	38	48
Stamm	Jmn	.	.	.	75	80	0	52	43	35	50	35	55
Sonja	Jmn	.	.	.	65	70	2	54	45	39	40	40	40
Azizi	Nov	App	.	.	61	77	7	47	48	42	45	30	35
Elija	Nov	.	.	App	60	58	22	42	40	42	36	53	40
Hawk	Nov	.	.	App	70	85	10	45	35	38	55	35	35
Chani	Nov	.	.	App	47	67	20	37	47	57	37	47	37
Zed	Nov	Nov	Nov	Nov	60	60	10	40	40	40	50	40	40

Note: Jmn = Journeyman, Nov = Novice, App = Apprentice, Neo = Neophyte, Mr = Magic Resistance, Fr = Fire Resistance.

Drol
For unlimited men:

Trk	Sct	Byte	From	To
0B	0A	21	01	00
11	0A	0F	01	00
17	09	B1	01	00

Dung Beetles
BLOAD DUNG BEETLES
CALL-151
3D3D:53 CC CF
3D54:CD C2
BSAVE DUMB BEETLES, A$7FD, L$4000

Evolution
6731:x *where x=# of guys*
6000G

Falcons
reset
685B:x *where x=# of ships*

Falcons II
685B:x *where x=# of ships*
1. Run game
2. Request 1 ship
3. Hit reset
4. 6040G

Free Fall
BLOAD FREE FALL, A$800
CALL-151
614E:x *where x=# of men*
7A5<800.845BM N 7FDG

Frogger
70DB:x *where x=# of frogs*
7FDG

Galaxian
BLOAD APPLE GALAXIAN
CALL-151
A83:x *where x=# of men*
7FDG
4886:01 *to set score for bonus ship*
4800G

Gobbler
BLOAD GOBBLER
CALL-151
6046:x *where x=# of gobblers*

Gold Rush
BE3:x *where x=# of guys*
B00G

Hard Hat Mack
Press ctrl-R and then a number (1-3).

Hard Hat Mack (alternate)
503:18 60 N
50A5:EA EA EA N
82DG

Hellstorm
6F25:x *where x= level#*
6F4A:x *where x=# of ships*

Horizon V
5B0A:E6 *(Unlim)*

Jawbreaker II
84B:x *where x=# of guys*
800G

Jump Jet
131D:EA EA EA

Joust (Atarisoft)
BLOAD JOUST *61 sector file*
CALL -151
FFDG *run 2nd program*
B7C3:x *where x=number of men*
B7AA:00 *go through rocks*
3E00G *starts game*

Jouster
BLOAD JOUSTER
CALL -151
219E:09
CTRL-C
BSAVE JOUSTER.9, A$800, L$75FF

Jouster (alternate)
955:EA EA EA

Kameari
BLOAD PUCK1
BLOAD PUCK2
B82:EA EA *unlimited guys*
952:EA EA *weird effects*

Kameari
BLOAD PACK.DATA1
BLOAD PACK.DATA2
B82:EA EA
7FDG
95C:EA EA
7FDG

Labyrinth
Press (at the same time) esc K A Y and then press 1-8 to go to that level or 9 for ships.

Mars Cars
BLOAD MARS CARS
CALL-151
7024:x *where x=# of cars*
3FDG

Marauder

Trk	Sct	Byte	From	To	
01	03	46	03	00	*For less "baddies"*

Microwave
reset *after the logo comes up.*
CALL-151
8146:00 *For less monsters*
8100G
For unlimited men:

Trk	Sct	Byte	From	To
00	0D	3E	CE BD 0B	EA EA EA
19	0A	3E	CE BD 0B	EA EA EA

For unlimited power:

Trk	Sct	Byte	From	To
19	0C	75	CE 1F 0B	EA EA EA

Millipeed
602A:x *where x=#*
1F00G

Miner 2049er
reset
816:x *where x=# of guys*
980G

Miner 2049'er
812:x *where x=level#*
814:x *where x=level#-1*
816:x *where x=# of men*
981G

Money Munchers
1020:x *where x=# of men*
FE7G

Montezuma's Revenge
BLOAD MONTEZUMA'S REVENGE
CALL -151
63BC:A9 60
13F0G

Mouskattack
6A53:EA EA EA

Mr. Robot and the Robot Factory
BLOAD MR. ROBOT
80A3:59 FF
76DG
7685:x *where x=# of robots*
7600G

Neptune
BLOAD NEPTUNE
CALL-151
8290:x *where x=# of ships*

Night Crawler
BLOAD NIGHT CRAWLERS
CALL-151
340A:x *where x=# of ships*
3300G *start game*

Nightcrawler
340A:x *where x=# of ships*
3300G

Nightmare Gallery
6818:EA EA EA
8718:EA EA EA
671B:EA EA EA
861B:EA EA EA

Nomads
41E9:EA EA EA
26FAG

Outpost
2C22 & 8046:#
3798:EA EA

Phaser Fire
BLOAD PHASER FIRE
CALL-151
366A:EA EA EA
3FFDG

Phaser Fire (alternate)
452E:x *where x=# of ships*
3FFDG

Pooyan
BLOAD POOYAN *or Boot up*
CALL -151
60ED:x *where x=# of men*
7FDG

Quadrant 6112
980:x *where x=# of ships*

Quest For Tires
ctrl reset
7A11:x *where x=# of wheels*
7A03G *to restart game*

Raiders of the Lost Ring
reset
685A:x *where x=# of ships*
803G

Randamn
These are the four Magical Incantations used in Randamn to allow you to bypass certain levels.
TOMB
DROWN
OOZE
RISK

Raster Blaster
692E:EA EA EA EA EA
2700G

Rearguard
ctrl-T + LEVEL #

Repton
BLOAD REPTON
BLOAD MAIN REPTON, A$3000
21B6:EA EA
21C9:EA EA *unlimited ships*
1592:EA EA *unlimited nukes*

Repton (alternate)
19C4:4C CB 19 N
19D7:60 N D92:EA EA

Ribbit
BLOAD RIBBIT
70DB:x *where x=# of frogs*
7FDG
or
6000G

Robotron:2084
BLOAD ROBOTRON
CALL -151
53D0:EA EA 18 N 2DFDG
This makes you invincible!

Sea Dragon
8C32:00 *(air)*
8C59:00
8C72:EA EA *(damage)*
5C43G

Seafox
BLOAD SEAFOX
CALL-151
69D9:x *where x=# of subs*
7FDG

Sea Fox (alternate)
BLOAD SEA FOX, A$800
6A34:x *where x=# of ships*
7A5<800.8960M N 800G

Serpentine
BLOAD SERPENTINE
CALL-151
81A:x *where x=# of serpents*
7FDG

Sneakers
BLOAD SNEAKERS
CALL-151
6EBB:x *where x=# of ships*
C050 C055 *turn on Hires screen*
329G *start game*

Snack Attack
5B28:#
6FDG

Snake Byte
reset *or BLOAD game*
16AE:x *where x=# of snakes —OR—*
726E:x *where x=# of snakes*
7265:x *where x = starting level*
76BD:x *where x=# of apples to eat per level*
77EAG *—OR—*
250G

Snake Byte (alternate)
725E:x *where x=# of snakes*
or
16AE:x *where x=# of snakes*
7265:LEVEL
77EAG

Snapper
For more snappers:
BLOAD SNAPPER
CALL-151
851:x *where x=# of snappers*
7FDG

Snoogle
Press ctrl-shift-M when you are a pie falling apart. Scoring is as follows:

CHERRY	100	STRAWBERRY	300
ORANGE	500	APPLE	700
PLUM	1000	BELL	2000
GOLDKEY	3000	KING CROWN	5000

Space Cadets
BLOAD SPACE KADET
CALL -151
5DDE:x *where x=# of guys*
7FDG

Space Quarks
BLOAD SPACE QUARKS
CALL-151
3C54:x *where x=# of ships*
BDFG *starts game*

Spy's Demise
60AB:x *where x=# of spys*
3FF1G or
C050 C057 C054
1100G

Star Maze
50B2:EA EA

Starmaze (alternate)
459C:x *where x=# of ships*

Star Thief
1827:x *where x=# of ships*

Star Trek
BLOAD STAR TREK
CALL -151
FED:60
7FDG

Succesion
BLOAD SUCCESION
CALL -151
6B71:x *where x=# of guys*
6000G

Super Puckman
147B:04
1C40:60
800G

Swashbuckler
BLOAD SWASHBUCKLER
CALL-151
AE0:x *where x=# of pirates*
1800G *start game*

Syzygy
BLOAD SYZYGY
CALL-151
2954:x *where x=# of ships*
800G

Taxman
Note: this does not work on taxman II
BLOAD TAXMAN
POKE 21041,x *where x=# of men*
POKE 20572,234
POKE 20573,234
POKE 20574,234 *for no ghosts*
CALL 2048 *to start game*

Taxman (alternate)
BLOAD TAXMAN
CALL-151
505C:EA EA EA *For no ghosts*
89CB:x *where x=# of ghosts*
522B:x *where x= level#*
5231:x *where x=# of men*
800G *start game*

Teleport
reset
41D1:EA EA EA
5F8CG

Thief
BLOAD THIEF
4873:EA EA EA EA EA

Threshold
BLOAD THRESHOLD
Unlimited ships:
CALL -151
45B0:EA EA EA
7ECD:EA EA EA
No laser overheat:
7666:4C 7D 76
Unlimited fuel:
7623:EA EA EA
7839:EA EA EA
6B00G *start game*

Thunderbombs
2E39:EA EA EA

Tubeway
BLOAD TUBEWAY
CALL-151
22D5:x *where x=# of ships*
or
2083:EA EA
900 or 7FD or

Tubeway (other)
esc-R

Ultima III
The Magic Word is Evocare or Evocate
To gain access to Exodux castle, go into the dungeon to the south east of your home castle. On the eighth level of the dungeon you will find the Mark of the Snake. Force all of your men to touch this. Then bring your boat in front of the Silver Snake and yell "Evocare". You will then be transported to a secret castle. Letting your boat get sucked into the whirlpool can be beneficial.

Viper
CCD:C0
7FDG

Wargle
BLOAD WARGLE.OBJ
7250:x *where x=# of guys*

Wizardry
When you go to the Adventurers Inn, get your character, and before you say what room to put it in, insert a blank formatted diskette in drive 1. Each time you sleep in the inn, you gain a level!
If you have a Bishop in your party, simply type 'I' to inspect something. But type 9 instead of the usual 1-8. Try it a few times and when it says "SUCCESS!", your Bishop will have 100,000,000 experience points!

BBS RDEX

Nancy Jentzsch

Softkey for...
World Geograph v1.1
MECC

The 'crack' for World Geograph v1.0 also works for v1.1, with a slight change in the location of the protection and a change in the addresses that are called. Thanks to Brian Troha for the original. I followed his logic and found the protection on the same track and from there could use his changes to make v1.1 work!

1. Make a copy of each of the two disks with any whole disk copier.
2. Edit the program disk copy.

Blk	Byte	From	To
9	$173	20 3E 0B	AD 3E 0B
	$176	90 05	80 03
	$178	20 46 0A	AD 46 0A
	$17B	B0 23	EA 18

3. Write the block back to the copy

Alan L Krause Jr

Blocks vs Tracks

ProDOS & DOS sector correspondence

This is in response to Ken Ball's query in Computist #69 as to how blocks relate to the sectors that most programs still use, such as Copy II Plus.

First of all, let's get it straight here. There is no difference in the physical format of a DOS 3.3 disk and a ProDOS disk. Check it yourself. Get a DOS 3.3 disk and a ProDOS disk, and then get into your favorite nibble editor. The ProDOS disk still has $23 tracks, each track containing 16 sectors, and the address/data headers and epilogues are still the same (unless you are looking at a protected disk!).

Thus, a sector editor SHOULD be able to read a ProDOS disk, since it has the same marks in the address field as a normal DOS 3.3 disk.

So, you ask.. "What's the difference between ProDOS and DOS 3.3 then?".. Go ahead ask it! The difference lies in the 'RWTS' which is loaded after you boot your disk.. I put 'RWTS' in quotes, because under ProDOS, it is usually referred to as the ProDOS MLI, or machine language interface. Almost all disk access is ported through this little beauty. It make programing in assembly language soooo much easier, believe me!

Now, the ProDOS file/disk system is not built around the sector, as DOS 3.3 was, rather it is built around the block. 1 block = 2 sectors. But, not 2 consecutive sectors. This is where the difference enters. The authors of ProDOS found a way to minimize the writing time of the data to the disk, without losing data by trying to be too quick. Because ProDOS needs time in between each block it writes to do some internal 'housecleaning', it skips 1 sector each time it writes 1 sector (= 1/2 a block). This is a sufficient time for the apple to 'recover' and proceed with the write operation.

If we took one track out, and stretched it out until it was 'straight', it would look like table 1.

Thus, block $0000 is written at track $00, physical sectors $00 and $02. Notice how the blocks 'wrap around'. This is one of the ideas which make ProDOS up to 8 times faster than DOS 3.3.

But, these 'sectors' are physical sectors, and not the sectors which are read when you use a sector editor, such as Copy II plus. The sectors used there are standard DOS 3.3 sectors, and these are the sectors which most of us are familiar with.

To read block $0000, you would have to read sectors $00 and $0E with your favorite sector editor.

Table 2 shows you what track and sectors a block resides on a 5 1/4" disk.

Say, you want to look at block $00E9. So, you find it in the table, and see that it is located on track $1D, sectors D&C. So, break out Copy II Plus, and hack away. I hope that this has answered your question sufficiently. Maybe cut out this table and stick on the wall next to your computer or something. Better yet, ditto the page FIRST, and then cut it out and put it up!

Brian A. Troha

Softkey for...

Ancient Land of Ys

Broderbund

Requirements:
512K Apple IIgs
3.5" disk copier
3.5" disk editor

Ancient Land of Ys (ALY) from Broderbund is an adventure role playing game. You control a little guy and run around completing various quests in an effort to regain the six books of Ys. The game comes on two disks, the /PROGRAM disk and the /DATA disk. The file YSBOOT .SYS16 on /PROGRAM checks for enough memory then runs the program YSGS on /DATA. This information was useful when it came time to search for the copy protection.

The overall game is nice with good graphics and sound, however, ALY has two problems. The first problem is ALY is copy protected and the other is it is NOT hard disk compatible. The reason I'm writing this article is I have been successful in over coming both of these problems. First lets start by removing the copy protection. Broderbund has been known to use the standard nibble counting routine on tracks $20 & $21 on a few programs (Showoff, Geometry, Where in the World is Carmen Sandiego). So I began by searching for the key string (I have mentioned in so many articles) of A2 20 A0 01. I found the following routine on block $4A6 of the /DATA disk:

```
07:A9 00 00      LDA #$0000    Load a zero
0A:8D CA 65      STA 65CA      Zero out nibble count
                               read error flag
0D:8D C6 65      STA 65C6      Zero out nibble count
                               sum for track $20
10:8D C8 65      STA 65C8      Zero out nibble count
                               sum for track $21
13:E2 30         SEP #$30      Use 8 bit wide Accum
                               and index regs
15:A2 20         LDX #$20      Load track $20
17:A0 01         LDY #$01      Load side
19:20 4E 65      JSR 654E      Go to nibble count
1C:B0 13         BCS 31 (+13)  Carry set is read error or
                               wrong disk
1E:8E C6 65      STX 65C6      Store lo-byte sum for
                               track $20
21:8C C7 65      STY 65C7      Store lo-byte sum for
                               track $20
24:A2 21         LDX #$21      Load track $21
26:A0 01         LDY #$01      Load side
28:20 4E 65      JSR 654E      Go to nibble count
2B:8E C8 65      STX 65C8      Store lo-byte sum for
                               track $21
2E:8C C9 65      STY 65C9      Store hi-byte sum for
                               track $21
31:C2 30         REP #$30      Set 16 bit wide Accum
                               and index regs
33:90 0C         BCC 41 (+0C)  Carry clear was a good
                               read
35:AD CA 65      LDA 65CA      Read errors or wrong
                               disk come here
38:49 FF FF      EOR #$FFFF
3B:1A            INC
3C:A2 FF FF      LDX #$FFFF    Load bad values
3F:80 06         BRA 47 (+06)  Branch to the RTS
```

```
41:A9 C6 65      LDA #$65C6    lo-word pointer to sums
44:A2 00 00      LDX #$0000    hi-word pointer to sums
47:60            RTS           Return to sender
48:5A            PHY           Push side
49:DA            PHX           Push track
4A:F4 00 00      PEA 0000
4D:F4 67 65      PEA 6567      Push pointer to disk/
                               volume name
50:22 A0 66 00   JSL 0066A0    Count them up
54:8D CA 65      STA 65CA      Temp store for Accum
57:68            PLA
58:68            PLA
59:68            PLA
5A:68            PLA
5B:68            PLA
5C:68            PLA           Pull all pushed values of
                               the stack
5D:AD CA 65      LDA 65CA      Reload Accum (read/
                               wrong disk flag)
60:60            RTS           Return
61:50524F4752414D              6567 - PROGRAM; disk/
                               volume name
```

That was the routine to do the nibble counting. After tracing the program code back a couple of times I ended up with the following code on block $3BF on the /DATA disk:

```
059:0B           PHD
05A:3B           TSC
05B:38           SEC
05C:E9 FB 00     SBC #00FB
05F:5B           TCD
060:69 CE 00     ADC #00CE
063:1B           TCS
064:22 6F 65 00  JSL 00656F    Goto the nibble count
                               routine above
068:86 D2        STX D2        Store hi-word of pointer
                               to sum values
06A:85 D0        STA D0        Store lo-word of pointer
                               to sum values
06C:64 E0        STZ E0        Clear a "benchmark"
                               flag
06E:A5 E0        LDA EA        Load flag
070:F0 03        BEQ 075 (+03) If it's zero then
                               branch to benchmark
                               tests
072:82 B4 00     BRL 129 (+00B4) Branch long to
075:38           SEC           continue code
076:A5 D0        LDA D0
078:E9 00 00     SBC #0000
07B:D0 07        BNE 084 (+07)
07D:A5 D2        LDA D2
07F:E9 00 00     SBC #0000
082:80 07        BRA 08B (+07)
084:A5 D2        LDA D2
086:E9 00 00     SBC #0000
089:C2 02        REP #$02
08B:70 03        BVS 090 (+03)
08D:49 00 80     EOR #$8000
090:30 22        BMI 0B4 (+22)  Branch to compare
092:F4 01 00     PEA 0001       sums
095:F4 60 00     PEA 0060
098:F4 10 00     PEA 0010
09B:F4 00 00     PEA 0000       Push info on stack for
09E:F4 B0 02     PEA 02B0       call
0A1:22 B7 0D 00  JSL 000DB7     Insert /PROGRAM disk
                                routine
0A5:7A           PLY
0A6:7A           PLY
0A7:7A           PLY
0A8:7A           PLY            Pull all pushed info off
0A9:7A           PLY            the stack
0AA:22 6F 65 00  JSL 00656F     Goto nibble count
                                routine
0AE:86 D2        STX D2
0B0:85 D0        STA D0         Store the pointer again
0B2:80 C1        BRA 075 (-3F)  Branch back up
0B4:A6 D2        LDX D2
0B6:A5 D0        LDA D0         D0 & D2 point to track
                                $20 sum
0B8:86 DE        STX DE         Transfer sum
0BA:85 DC        STA DC         to DE & DC
0BC:A6 DE        LDX DE
0BE:A5 DC        LDA DC
0C0:DA           PHX
0C1:48           PHA            Push on stack
0C2:18           CLC
0C3:69 02 00     ADC #$0002     Add 2 to track $21 sum
0C6:85 DC        STA DC
0C8:A5 DE        LDA DE
0CA:90 01        BCC 0CD (+01)  If DC was FFFE or
                                FFFF carry set
0CC:1A           INC            Then increment the hi-
                                word
0CD:85 DE        STA DE         DE & DC now hold
                                pointer to track $21
0CF:68           PLA
0D0:FA           PLX            Pull pointer off stack
0D1:85 F6        STA F6
0D3:86 F8        STX F8         F6 & F8 now hold track
                                $20 sum
0D5:A7 F6        LDA [F6]       Load indirect long track
                                $20 sum
0D7:85 DA        STA DA         Store track $20 sum in
                                DA
0D9:A7 DC        LDA [DC]       Load indirect long track
                                $21 sum
0DB:85 D8        STA D8         Store track $21 sum in
                                D8
0DD:A5 DA        LDA DA         Load track $20 sum
0DF:38           SEC
0E0:E9 6B 20     SBC #$206B     The hard way to
                                compare the sum
0E3:F0 37        BEQ 11C (+37)  it should be higher
                                then 206B
0E5:70 03        BVS 0EA (+03)  but less then 2103
0E7:49 00 80     EOR #$8000     all branches to 11C are
                                failures
0EA:10 30        BPL 11C (+30)
0EC:A5 DA        LDA DA
0EE:38           SEC
0EF:E9 03 21     SBC #$2103
0F2:70 03        BVS 0F7 (+03)
```

```
0F4:49 00 80     EOR #$8000
0F7:30 23        BMI 11C (+23)
0F9:A5 D8        LDA D8         Load track $21 sum
0FB:38           SEC            The hard way to
0FC:E9 AF 1D     SBC #1DAF      compare the sum
0FF:F0 1B        BEQ 11C (+1B)  it should be higher
                                the 1DAF
101:70 03        BVS 106 (+03)  but less then 1E79
103:49 00 80     EOR #$8000     again, all branches to
                                11C are failures
106:10 14        BPL 11C (+14)
108:A5 D8        LDA D8
10A:38           SEC
10B:E9 79 1E     SBC #$1E79
10E:70 03        BVS 113 (+03)
110:49 00 80     EOR #$8000
113:30 07        BPL 11C (+07)
115:A9 01 00     LDA #$0001     Load a non-zero value
118:85 E0        STA E0         Store in "benchmark"
                                flag so BEQ is NOT
                                taken
11A:80 0A        BRA 126 (+0A)  Branch to branch
                                long
11C:A2 FF FF     LDX #$FFFF
11F:A9 FF FF     LDA #$FFFF     Load failing values
122:68 D2        STX D2
124:85 D0        STA D0         Store them
126:82 45 FF     BRL 06E (-00BB) Branch long to
                                the top and start over
129:F4 00 00     PEA 0000       Continue code for the
                                program
```

The above section of code is the deciding factor in the copy protection routine. The first JSL 00656F must be disabled by changing the 22 to an AF. Then we come to the STZ E0 and the LDA E0, well E0 will equal one on a passing copy so I changed the LDA E0 to INC E0. Now we zero out E0 and then increment E0 to get the value of one. The final step is to disable the BEQ +3 and that is done by over writing it with two NOPs. The resulting copy is now deprotected and will run just fine from two 3.5" disk. The step by step would be:

1. Make a copy of both disks.
2. Make the following edits to the /DATA disk:

Blk	Byte	From	To
$3BF	$64	22 6F 65 00	AF 6F 65 00
	$6E	85 E0 F0 03	E6 E0 EA EA

3. Write the block back to the copy.

Hardkey for...

Ancient Land of Ys

Broderbund

ALY is now deprotected but it's not hard disk compatible, yet. After some work I was able to come up with a scheme of edits that fixes this problem. The fix includes editing two system files and renaming two files on different disks. Also the end product will require about 935K of disk space and will no longer be RUN-able from 3.5" disks.

At this point I suggest you first make TWO sets of deprotected backups. Label one set Ancient Land of Ys. The other set we will use for the hardkey. You should now already have deprotected the program via the edits listed earlier. The following steps are done using the /PROGRAM disk, Block Warden users [F]ollow /PROGRAM/ YSBOOT.SYS16

Fixing the program

1. With a block editor make the following changes (With Block Warden's "Follow" command use rel block 1, rel byte $98):

Blk	Byte	From	To
$1C7	$98	0A 2F 44 41	09 31 2F 59
		54 41 2F 59	53 2E 47 41
		53 47 53	4D 45 00

That changes "/DATA/YSGS" to "1/ YS.GAME". Note: Make sure to change the final "S" (53) to 00 in hex.

2. Rename YSBOOT.SYS16 to LAND.OF.YS

Now it's time to work with the /DATA disk. (For Block Warden, [F]ollow /DATA/YSGS)

1. Change from /program (2F 70 72 6F 79 6C 65 6D in hex) to 1/ys.dat (31 2F 79 73 2E 64 61 79 in hex) at all the following locations:

Block	Byte	Rel Blk	Rel Byte
$57C	$D2	452	$386D2
	$E9		$386E9
	$101		$38701
	$11C		$3871C
	$138		$38738
	$157		$38757
	$173		$38773
	$190		$38790
	$1A7		$387A7
	$1C0		$387C0
	$1DB		$387DB
	$1F4		$387F4
$57D	$0E	453	$3880E
	$28		$38828
	$3F		$3883F
	$5C		$3885C
	$77		$38877
	$93		$38893
	$AF		$388AF
	$CA		$388CA
	$11A		$3891A (in upper case)
$598	$98	480	$3BE98

2. Change from /DATA/YSDATA (2F 44 41 54 41 2F 59 53 44 41 54 41 in hex) to 1/YS.DAT/ LOY (31 2F 59 53 43 2E 44 41 54 2F 4C 4F 59 in hex) at all the follow locations:

Block	Byte	Rel Blk	Rel Byte
$582	$15B	458	$3935B
	$19A		$3939A
$584	$83	460	$39683

Table 1

blocks/physical sectors/DOS 3.3 sectors

block	0	4	0	4	1	5	1	5	2	6	2	6	3	7	3	7
Physical	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
DOS3.3	0	7	E	6	D	5	C	4	B	3	A	2	9	1	8	F

Table 2

Physical Sector #'s

Trk	0 & 2	4 & 6	8 & A	C & E	1 & 3	5 & 7	9 & B	D & F
$00	$0000	$0001	$0002	$0003	$0004	$0005	$0006	$0007
$01	$0008	$0009	$000A	$000B	$000C	$000D	$000E	$000F
$02	$0010	$0011	$0012	$0013	$0014	$0015	$0016	$0017
$03	$0018	$0019	$001A	$001B	$001C	$001D	$001E	$001F
$04	$0020	$0021	$0022	$0023	$0024	$0025	$0026	$0027
$05	$0028	$0029	$002A	$002B	$002C	$002D	$002E	$002F
$06	$0030	$0031	$0032	$0033	$0034	$0035	$0036	$0037
$07	$0038	$0039	$003A	$003B	$003C	$003D	$003E	$003F
$08	$0040	$0041	$0042	$0043	$0044	$0045	$0046	$0047
$09	$0048	$0049	$004A	$004B	$004C	$004D	$004E	$004F
$0A	$0050	$0051	$0052	$0053	$0054	$0055	$0056	$0057
$0B	$0058	$0059	$005A	$005B	$005C	$005D	$005E	$005F
$0C	$0060	$0061	$0062	$0063	$0064	$0065	$0066	$0067
$0D	$0068	$0069	$006A	$006B	$006C	$006D	$006E	$006F
$0E	$0070	$0071	$0072	$0073	$0074	$0075	$0076	$0077
$0F	$0078	$0079	$007A	$007B	$007C	$007D	$007E	$007F
$10	$0080	$0081	$0082	$0083	$0084	$0085	$0086	$0087
$11	$0088	$0089	$008A	$008B	$008C	$008D	$008E	$008F
$12	$0090	$0091	$0092	$0093	$0094	$0095	$0096	$0097
$13	$0098	$0099	$009A	$009B	$009C	$009D	$009E	$009F
$14	$00A0	$00A1	$00A2	$00A3	$00A4	$00A5	$00A6	$00A7
$15	$00A8	$00A9	$00AA	$00AB	$00AC	$00AD	$00AE	$00AF
$16	$00B0	$00B1	$00B2	$00B3	$00B4	$00B5	$00B6	$00B7
$17	$00B8	$00B9	$00BA	$00BB	$00BC	$00BD	$00BE	$00BF
$18	$00C0	$00C1	$00C2	$00C3	$00C4	$00C5	$00C6	$00C7
$19	$00C8	$00C9	$00CA	$00CB	$00CC	$00CD	$00CE	$00CF
$1A	$00D0	$00D1	$00D2	$00D3	$00D4	$00D5	$00D6	$00D7
$1B	$00D8	$00D9	$00DA	$00DB	$00DC	$00DD	$00DE	$00DF
$1C	$00E0	$00E1	$00E2	$00E3	$00E4	$00E5	$00E6	$00E7
$1D	$00E8	$00E9	$00EA	$00EB	$00EC	$00ED	$00EE	$00EF
$1E	$00F0	$00F1	$00F2	$00F3	$00F4	$00F5	$00F6	$00F7
$1F	$00F8	$00F9	$00FA	$00FB	$00FC	$00FD	$00FE	$00FF
$20	$0100	$0101	$0102	$0103	$0104	$0105	$0106	$0107
$21	$0108	$0109	$010A	$010B	$010C	$010D	$010E	$010F
$22	$0110	$0111	$0112	$0113	$0114	$0115	$0116	$0117
Trk	0 & E	D & C	B & A	9 & 8	7 & 6	5 & 4	3 & 2	1 & F

DOS 3.3 Sector #'s

3. Change from /DATA/ (2F 44 41 54 41 2F in hex) to 1/ (31 2F 00 00 00 00 in hex) at Block $582, Byte $193, Rel BLK 458, Rel Byte $39393

4. Rename YSGS to YS.GAME

5. Rename YSDATA to LOY

Uploading to a Harddrive

Now it's time to upload the whole game to your hard drive. Create a new folder/subdirectory called LAND.YS or what ever you like.

1. Copy LAND.OF.YS from /PROGRAM to the LAND.YS folder

2. Create a new folder called YS.DAT in LAND.YS folder

3. Copy the TITLE & FGRAPH folders from /PROGRAM in to the YS.DAT folder

4. Copy YS.GAME from /DATA to the LAND.YS folder

5. Copy the LOY folder from /DATA into the YS.DAT folder

A tree directory of the main files would look like this:

```
File name            Type
LAND.OF.YS           S16
YS.GAME              EXE
/YS.DAT              DIR
   /TITLE            DIR
   /FGRAPH           DIR
   /LOY              DIR
      /MAPS          DIR
      /SHAPES.ART    DIR
      /GCH.ART       DIR
      /MUSIC         DIR
      TEXTDAT.HUF    $00
      PEOPDAT.HUF    BIN
```

To run Ancient Land of Ys simply run/launch the LAND.OF.YS file. I did not change the user disk name so you will still need a separate disk for your character information called /USER (read the flier on creating a game save disk). If you wanted to, you could search YSGS (YS.GAME after you have renamed it) for /USER and change it to 1/CHR. Then you would have to create a new folder in the same subdirectory as LAND.OF.YS called CHR and copy any needed files to it. All information will be stored in the folder called CHR on your hard disk instead of the separate disk.

If you didn't make any errors in the editing of the file names you should have a hard disk compatible version of ALY. At this point I would (after you have upload the files to the hard drive) get out two more disk and format them. Call the disks Ancient Land of Ys HD 1 and 2 and copy the files LAND.OF.YS and YS.GAME to disk one and the folder YS.DAT to disk two. This way should loose you hard drive (crash) and have to reformat you will not have to go through and re-edit Ancient Land of Ys.

Softkey for...

Tunnels of Armageddon

Logical Design Works/California Dreams

Requirements:
512K Apple IIgs
3.5" disk copier
3.5" disk editor

Tunnels of Armageddon (TOA) is fast paced arcade type game that has you screaming down tunnels avoiding walls and trying to shoot enemy ships. Like the other five releases from LDW TOA is using a KEYWORD (pirate) protection in the form of a color code wheel. The requestor screen comes up and tells you to line up two colors and then asks for a color at a certain number. As I hate this type of copy protection I set out to disable it.

On a tip from Jason Harper (and after digging around in the CP code) if you type kacper (lower case only) the CP is bypassed and a cheat mode enabled that will allow you to continue after running out of time. However, running out of energy or structural damage will still kill you. Anyway I have come up with a patch that will allow you use this built in cheat or click on any color and still play the game. To do this, the CP routine must still be run but I modified the return code to return with a "correct answer" value. For those of you who are willing to give up the cheat and would rather not ever see the CP screen I have added a second set of patches to get around that to!

1. Make a copy of the game disk.

2. Make the following edits to the copy only:

Blk	Byte	From	To
$3B	$96	F0 05 A9 00	EA EA EA EA
		00 80 03	EA EA EA

3. Write the block back to the copy

To totally skip the CP screen and forfeit the built in cheat ADD the following:

Blk	Byte	From	To
$39	$FC	A2 04 91	A2 04 90
	$10C	A9 01 00	82 4E 03
$3B	$1D0	B7 D4 97 D0 88	EA EA EA EA EA
		88 10 F8 A7 D4	EA EA EA EA EA
		87 D0	EA EA
$3C	$C1	B0 03 A9 00 00	EA 18 82 48 02

To upload the program to your hard drive just copy all files into any folder/subdirectory except PRODOS and SYSTEM. Enjoy the newly deprotected version of Tunnels of Armageddon.

Note #2

Date: 3 Mar 90 (07:08)
To: ALL
From: User #269
Subj: DUNGEON MASTER

⑦ In Computist #70 page 12 : Softkey for ... DM by Bob Thanski) Softkey gave a way to backup our original DM disk, I could not get it to work properly. The game did not crash, but I could not open doors. It acted like a demo disk. I may have a different version? Did anyone else have problems or did it work satisfactory?

1) Perform a sector copy of the disk
2) Perform the patches indicated in Issue #70.
3) Do a BIT COPY, SYNC, KEEP track length, (using Copy II+ param 4C set to 0) of Block 1 Side 2 (the one that shows an error during step 1 above).
This will (should) yield a playable copy however, any attempt at disk access will eject the disk & say "INSERT DUNGEON MASTER DISK" which means that you can't save the game... Well Bob, ya wanna give it another go, or do you have a different version? <sysop>

Note #3

Date: 8 Mar 90 (20:29)
To: ALL
From: User #1082
Subj: Cracks

⑦ Does anyone have a crack for Toy Shop or Bureaucracy? I have the originals that I'll lend to someone that may be able to do it.

Note #4 (Reply to #3)

Date: 11 Mar 90 (01:37)
From: Sysop
Subj: Cracks

Toy Shop: Issue #62, pg. 29
Bureaucracy: Issue #48, pg 33

If these don't work or you don't have (can't get) the issues, I do backups for the local Apple user group (NorthWest Apple Pickers) & Computist. I usually charge $2 per program (or $1 per disk whichever is greater) plus $2 shipping & handling (Add $1 per disk if I supply the blank disks for the copies.) I also include the copy protection method used with the copied disks so that if capable (or inclined) you can make added backups yourself. If I can't make a good working copy, there is no charge & the disks and money are refunded together.

If you decide to have me do them, send original disk(s) (I will not attempt to make working copies from any disk that is not an original) to:

Gopher-Tech Electronics (or Computist BBS)
c/o David Goforth
11015 Old Military Rd SW
Tacoma, WA 98498-1524

Include a short letter of what you'd like (multiple copies, allow for hard disk installation, 5.25 -> 3.5 transfer, single working copy, deprotection, etc.) and also a phone # that I can call if necessary. If you'd like to contact me in person, leave E-Mail.

Note: Ensure you state that you are a Computist subscriber. This gives you the above prices (which are a 50% discount).

Note #8 (Reply to #3)

Date: 23 Mar 90 (21:15)
From: User #1054
Subj: Cracks

I just recently purchased Bureaucracy at the AM Computer Swap at Kent commons on March 17th. Well I looked for a possible crack in all of my Computist magazines and didn't find one. One thing I must say is that I am a new programmer, etc. My copy of Bureaucracy is labeled as Apple II (16-sector disk) -side 1. Other side is side 2. Side one can be copied with any copier (I used Locksmith 5.0 Fast Copy) but side two is a different story. You can try to copy side two with Locksmith 5.0 Fast copy but when you try to play the game it doesn't work. Well what I did was use EDD III selected duplicate disk and then selected #3 (auto nibble count) it copied the disk with errors on tracks 1F thru 22. The errors according to the EDD display was R W R R.

Further investigation into those tracks really didn't show me anything at all, but as I said before I am new at this and am doing my best with what little I know. One thing I should say is that when I used the disk speed option of Locksmith 5.0 I found that the speed of the Infocom disk was approximately 195.5 to 195.6. I tried to copy the disk using EDD option #1 (normal) with my duplicate drive set at 195.5 and copying only disk tracks 00 thru 1E but when I played the game I went to the bank and the disk whirred and I received this message "Internal error 14. End of session." So it looks like the program is doing something that requires tracks 1F thru 22 to be there. Just remember side 1 you can copy with any copier but it is side 2 that is the problem. I sure hope this helps someone out there.

Note #9 (Reply to #3)

Date: 23 Mar 90 (21:20)
From: User #1054
Subj: Cracks

Hi, me again. I did forget to let you know that with EDD III using the auto nibble count option to copy Bureaucracy that the copy works fantastic, despite the errors. I have played the game and I have found no problems at this time at all. I will say that it is a crazy game too!!

Note #5

Date: 13 Mar 90 (09:37)
To: ALL
From: User #226
Subj: Toy Shop

Those two programs are 18 sector programs... I am not really sure if it was done as a protection method or simply to allow more data on the disk. Much like 3.2 was 13 sectors and 3.3 was 16 sectors these could be called 3.4 18 sectors. I know of only one person that could do them for you. The Saltine from the old COAST TO COAST group. You might try writing to him care of the COMPUTIST, they may still have his address. I have played with the 18 sector DOS, but have not had much success. I can get a conversion of the disk (2 original sides usually becomes three cracked sides). The problem comes in trying to rewrite their DOS to read 16 sectors, I know how to do it in theory (with a lookup table track 1 sector 17 would translate to track 2 sector 2). But one day... and if anybody knows of an IBM cracked.. I would be interested in talking to them.. I am about to get an IBM and am sure glad that computer is covered by the COMPUTIST.

Note #7 (Reply to #5)

Date: 23 Mar 90 (20:37)
From: User #1082
Subj: Toy Shop

I didn't know that the Saltine was a COMPUTIST subscriber.....he's also the one that did Where In the USA is Carmen SanDiego.... Federation Transformers Release. I can make a bit copy of Toy Shop that works....I can't get a copy that can be packed with Shrinkit.

Note #6

Date: 18 Mar 90 (16:43)
To: ALL
From: TOP GUN (User #452)
Subj: A) CDA Menu, B) Kings Quest IV

⑦ Some time back, a reader described the technique whereby the CDA menu could be disabled. This would eliminate using the "Visit Monitor" CDA that is part of the ROM 01 IIgs. Does anyone remember what issue that was? Or, perhaps, describe the solution?

⑦ I have Kings Quest IV from Sierra. I have it on my hard drive, but you need the manual to provide the "key word" when the program asks. Can anyone give me direction as to how to eliminate the protection? There is no readable text on the disk. Thanks.

John C. Tucker   IL

I have been a COMPUTIST reader from the start. I have every issue that has been published. I still keep the back issues for reference as they contain the best explanation of Apple techniques available. I hope you can continue to publish even though Apple is in disarray with their low end product strategy.

I need some help and I hope some COMPUTIST reader will be able to assist. I have a C. Itoh Prowriter 8510AP Printer and would like to continue using it as the Prowriter has been very reliable. I also have a Spies Niceprint interface card which gives me letter quality output. The Niceprint card emulates the old Grappler Card not the Grappler Plus. Parallel Pro drivers also seem to work.

⑦ Does anyone know how to patch the Imagewriter Printer driver in GS/OS System 5.0.2 to work with the Prowriter 8510AP? The printer codes are very similar except for bit image graphics which is 1B 47 for the Imagewriter and 1B 53 for the Prowriter. Is there a source where custom printer drivers for GS/OS may be purchased or dumped from a bulletin board? Any help you can give will be appreciated.

Brian A Troha   WI

I'd like to say some things. First in issue #70, page 5 in the editorial: I really cannot see the reason for printing the SPA's 800 number unless you are suggesting that readers call the number only to run up their (the SPA's) toll bill. You know, just call and say HI! and waste some time in talking with the people. I'm sure the information printed in COMPUTIST will in some form be used for piracy. This is by NO means the publishers (or the people who write deprotection articles) fault. Some of your better writers are pirates that share their talent and knowledge. I see no reason to try to discourage these writers by the potential threat of being turned in.

The commentary on the SPA's toll free number was meant to be a joke, laced with sarcasm. .... RDEXed

I remove copy protection and tell others how to do it, how people use my information is up to each individual. I have a choice, let people know how to deprotect software or not. Sure it has caused some piracy, but when I get letters from people telling me how nice it is to have programs hard drive based. How they save money by trashing deprotected copies and NOT the originals. How their originals have since failed and thanks to the information I have provided they can still use the program (deprotected copies that is). This makes my choice easy, let the people decide what to do themselves.

To StarBuck: I have written four little deprotection programs and put them up on "on-line" services like Comp-u-serve. I put them up as shareware to pay for my accounts on those serv- ices. I also post many kracks. I have been putting little COMPUTIST ads at the end of the text file posts. This helps spread the word about COM-PUTIST on a "national" level. There are many people that subscribe to these on-line services and they are looking for just such a magazine that explains how to remove CP. Anyway, in issue #70, you listed the krack for Arkanoid. If you (StarBuck) are going to list out my programs and convert them to block/byte patches the least you could do is give me credit for the work.

To Bob Thanski: Dungeon Master has a very complicated CP scheme. They (FTL) do check-summing all over and use several flags in their CP. The game must read block 17 correctly after changing the smartport hooks to special routines. Play the game long enough and it will start to break down. Things like Fatal error #003C, you cannot save games, certain doors will not open, things that you throw may just hang in space and you cannot pick them up again. There are all kinds of little things like this built into the game. There is CP code in the game data file and I'm not sure what else. This program will still have to be on the most wanted list.

I have seen letters by people who are having problems uploading kracked games to hard disks. Part of the reason these problems arise are disk based copy protection (bad block checks, nibble counts) check the disk name they try to read. So if you force the CP to pass at the lowest end, many times the disk name will be checked for before your patches. The way around this is to totally avoid the entire check routine.

In issue #67, I have patches for California Games and The Last Ninja that completely skip the CP routines including the check for the name of the disk. If you examine the code listed for Last Ninja you see the call to ProDOS 16 (the GET_DEVICE) checks to see if the program is run from the right disk. What the GET_DEVICE does is find the disk called "???" (the name in the parms) and tell ProDOS what device the disk is "mounted" on. After making my patch that jumps over the GET_DEVICE and READ_BLOCK code you can upload the game to any subdirectory without editing any disk names.

I hope you can see the importance of tracing the CP routines back far enough to totally avoid going into a routine that reads off the disk or checks for a certain disk name to be online.

Another possible reason for not being able to upload kracked programs to hard disk is: Many programs have disk/volume names hard coded into the file. You see things like "/VOLMUE/GAME". This means find the disk called /VOLUME and run/load the file called GAME. Programers should code it as "1/GAME" meaning use the current device and run/load the file called GAME. The "1/" trick is built into ProDOS 16 and GS/OS so you don't need any special programming skills to write device independent programs. With examples like Mean 18, Bubble Ghost, and the following on Shanghai you can get some idea of how to fix this kind of program.

The last thing I would like to talk about is the direction of copy protection as I see it going. With the "new" GS and ROM 3 (most tools in ROM) you might see more altered formats like Alien Mind as most tools no longer need to be loaded into memory. This fact along with the extra memory gained without having GS/OS present (I think about 380K) is a good reason for these formats. The only problem is for the users with Unidisks and those people with the Laser 3.5" disks and Universal disk controller who will NOT be able to use the program.

However, due to the dropping prices of SCSI Hard disks and the wave of internal hard disks, I think you will find more manual/codewheel based CP. So far, there's only two games with KEYWORD protection that have NOT been kracked by anyone. They are King's Quest 4 and Man-Hunter: New York by Sierra. With the additional knowledge I have gained since this type of CP has come out, I am able to defeat it with some ease. Then we have the KEYDISK (but hard drive-able) programs. These are the easiest to deprotect with information supplied in earlier COMPUTIST issues (like issue #65).

Rocket Ranger: There is no way to take out the code wheel in this game. The number inputted is the only way to tell the game to go from one country to another. A "work around" is to disable the changing of the CDA interrupt vector then write a CDA that allows you select the country you are in and the country you want to go to. Then the CDA would tell you the number of fuel units needed. Create the DESK.ACCS subdirectory on a backup rocket.ranger.1 disk and copy the CDA into it. Then when you play the game and need the fuel units hit ctrl-open apple-esc and select the CDA and the two countries, remember the number, quit back to the program and enter the number. That's what the pirates did.

For those of you with hard drives and GS/OS v5.0.x You might have noticed that you cannot run some ProDOS 8 based programs from your hard drive. Programs like Battle Chess, Neuromancer, ZanyGolf, MarbleMadness, Bard's Tale 1 & 2. Well on Comp-u-Serve there is a packed file that contains information on how to upload and correctly run many deprotected ProDOS 8 programs that otherwise don't seem to want to run. The idea behind the procedure (I think) revolves around purging everything possible from memory before running these programs.

Putting Shanghai on a hard disk

Alright, now that you spent $700 for that 60 meg SCSI hard drive (alter that statement to suit your own setup, EI: Internal drive, etc) you want to put your programs on it. That's easy for SOME

deprotected programs, but impossible for others... or is it? Sometimes we need help with these type of things, this is one good reason we subscribe to COMPUTIST. So here is an example of adding hard drive compatibility to a program using Shanghai (START file in /SHANGHAI/SYSTEM dated 15-Sep-87) from Activision. The reason I picked Shanghai as an example was I wanted it on my hard drive, so I set out to make it device independent.

Hardkey for...

Shanghai
Activision

Requirements:
512K Apple IIgs
3.5" disk copier
3.5" disk editor
File copying program
Hard drive

Step one: Remove the copy protection.

The first step in making any program hard drive compatible is removing the copy protection. The first step in removing the protection is to make a copy of the game disk (ignore errors) and use only the copy from here on. Make the following patches (to the copy):

Blk	Byte	From	To
$267	$145	C9 01 00 F0	A9 01 00 80
$27D	$168	18 FB C2 30	A9 01 00 6B

Note: Using Block Warden [F]ollow / SHANGHAI/SYSTEM/START.

Rel Blk	Rel Byte	From	To
36	$4745	C9 01 00 F0	A9 01 00 80
58	$7368	18 FB C2 30	A9 01 00 6B

Step two: Change the hard coded names.

The copy protection is now disabled, but you cannot simply upload Shanghai to your hard disk. The program loads files like /SHANGHAI/SYSTEM/DRAGON1, meaning find the disk called /SHANGHAI, then look in the subdirectory SYSTEM and load the file called DRAGON1. Now we don't want change the name of our hard drive to match this name. So what we can change the /SHANGHAI to 1/"something", but I didn't want to change the length of the name. I ended up dropping the first "A" in /SHANGHAI to make room for the "1". Also I finally decided instead of a subdirectory called SYSTEM we should call it DRAGON. Now you must edit the actual names in the file START. Disk names are easy to find using Block Warden as it will find upper, lower, and mixed case letters when searching for either case. Use Copy][+ v8's (or higher) sector editor from BC3.SYSTEM or Block Warden from ProSEL (Block Warden users should still be following START).

Change all occurrences of /Shanghai/System (hex: 2F 53 68 61 6E 67 68 61 69 2F 53 79 73 74 65 6D) to 1/Shnghai/Dragon (hex: 31 2F 53 68 6E 67 68 61 69 2F 44 72 61 67 6F 6E) at all of the following locations:

Blk	Byte	Rel Blk	Rel Byte
$245	$08	2	$208
	$25		$225
	$40		$240
$26D	$0C	42	$520C
$271	$1E3	46	$5BE3
	$1FC		$5BFC (cont. next blk)
$272	$15	47	$5C15

Change /Shanghai to just 1/Shnghai at:

Blk	Byte	Rel Blk	Rel Byte
$272	$50	47	$5C50

Alright, now that we have altered all the hard coded volume names we need to set up the NEW file structure. To begin format a new 3.5" disk with a name of /TEMP.

1. Copy the file START from /SHANGHAI/SYSTEM to /TEMP.

2. Rename START to SHANGHAI.

3. Create a subdirectory called SHNGHAI on /TEMP.

4. Copy the following files from /SHANGHAI to /TEMP/SHNGHAI:
   Bamboo
   Canwin
   Didit
   Fairwinds
   Fourdots
   Mandaringarden
   Ninehigh
   Twosontop
   Winds

5. Create a subdirectory called DRAGON in /TEMP/SHNGHAI.

6. Copy the following files from /SHANGHAI/SYSTEM to /TEMP/SHNGHAI/DRAGON:
   Titlescreen
   Copyright
   Tileset
   Dragon1
   Dragon2
   Turnament

A tree directory of your new disk should look like this:

File Name	Type
SHANGHAI	S16
/SHNGHAI	DIR
BAMBOO	$F2
CANWIN	$F2
DIDIT	$F2
FAIRWINDS	$F2
FOURDOTS	$F2
MANDARINGARDEN	$F2
NINEHIGH	$F2
TWOSONTOP	$F2
WINDS	$F2
/DRAGON	DIR

TITLESCREEN	PIC
COPYRIGHT	PIC
TILESET	PIC
DRAGON1	PIC
DRAGON2	PIC
TOURNAMENT	$F1

Now to finally upload Shanghai to your hard drive pick any subdirectory and copy the files Shanghai & the subdirectory Shnghai into it. To play Shanghai simply launch/run the S16 file called SHANGHAI. That's "all" there is to it.

If you were successful in following my instructions you should have a completely device independent game. Which means you can copy the program to any 3.5" disk, Hard drive, or RAM drive and launch it without problems. I have copied the files to /RAM5 and ran it without problems and Shanghai now resides in /CMS/GAMES on my hard drive. Shanghai is now (thanks to COMPUTIST) Deprotected, the way it should have been shipped: Deprotected, Hard drive compatible and you can launch it and quit back to the finder (ProSEL 16, Hyperlaunch, etc) without any problems.

This same principle can be applied to other programs that requires a specific disk/volume name.

Softkey for...

King of Chicago
Cinemaware

Requirements:
768K Apple IIgs
3.5" Disk copier
3.5" Disk editor

In King of Chicago (KC) you try to take control of your gang and the city of Chicago. This new release from Cinemawares has very good graphics along with a few good animated scenes. The sound quality is a little lacking compared to Defender of the Crown which is also by Cinemaware. However, like DOTC, Cinemaware is using nibble counting on tracks $20 and $21. The one thing that stands out about this nibble counting is it's mutated form. This new form is useful in hiding the routine from krackers. It looks like this (on block $573):

10D:0B	PLD		
10E:3B	TSC		
10F:38	SEC		
110:E9 FB 00	SBC #00FB		
113:5B	TCD		
114:69 F2 00	ADC #00F2		
117:1B	TCS		
118:64 F4	STZ 64		
11A:C2 30	REP #30		
11C:AD 04 00	LDA 0004		
11F:48	PHA		
120:22 00 00 00	JSL 000000	Move nibble count to bank 00
124:C2 30	REP #30		
126:85 F4	STA F4		
128:68	PLA		
129:A9 20 00	LDA #0020	Load track number $20
12C:8D 2A 00	STA 002A	Store it
12F:A9 01 00	LDA #0001	Load side number one
132:8D 2C 00	STA 002C	Store it
135:F4 D6 02	PEA 02D6	
138:F4 D6 02	PEA 02D6	
13B:22 AF 0B 00	JSL 000BAF	Goto nibble count routine
13F:7A	PLY	
140:7A	PLY	
141:AD 2E 00	LDA 002E	Load sum
144:8D 30 00	STA 0030	Store sum for track $20
147:A9 21 00	LDA #0021	Load track number $21
14A:8D 2A 00	STA 002A	Store it
14D:A9 01 00	LDA #0001	Load side number one
150:8D 2C 00	STA 002C	Store it
153:F4 D9 02	PEA 02D9	
156:F4 D9 02	PEA 02D9	
159:22 AF 0B 00	JSL 000BAF	Goto nibble count routine
15D:7A	PLY	
15E:7A	PLY	
15F:AD 2E 00	LDA 002E	Load sum
162:8D 32 00	STA 0032	Store sum for track $21
165:22 A4 00 00	JSL 0000A4	
169:3B	TSC	
16A:18	CLC	
16B:69 08 00	ADC #0008	
16E:1B	TCS	
16F:2B	PLD	
170:6B	RTL	Return to sender
171:0B	PHD	Start of nibble count routine
172:3B	TSC	
173:38	SEC	
174:E9 FB 00	SBC #00FB	
177:5B	TCD	
178:69 F2 00	ADC #00F2	
17B:1B	TCS	
17C:64 F4	STZ F4	
17E:E2 30	SEP #30	8 bit wide Accum.
180:AD 2C 00	LDA 002C	Load side
183:48	PHA	Push on the stack
184:AD 2A 00	LDA 002A	Load track
187:48	PHA	Push on the stack
188:C2 30	REP #30	16 bit wide Acumm.
18A:AD 24 00	LDA 0024	
18D:48	PHA	
18E:AD 22 00	LDA 0022	
191:48	PHA	
192:E2 30	SEP #30	8 bit wide Accum.
194:22 C1 00 00	JSL 0000C1	Count them up
198:E2 30	SEP #30	8 bit wide Accum.
19A:85 F4	STA F4	
19C:8E 2E 00	STX 002E	Store half of sum
19F:8C 2F 00	STY 002F	Store second half
1A2:68	PLA	
1A3:68	PLA	
1A4:68	PLA	
1A5:68	PLA	
1A6:68	PLA	Pull extra values off
1A7:68	PLA	of the stack
1A8:C2 30	REP #30	Set 16 bit wide Accum.
1AA:A5 F4	LDA F4	Zero means no errors
1AC:F0 10	BEQ 1BE (+10)	
1AE:F4 00 00	PEA 0000	
1B1:22 9D 30 01	JSL 01309D	
1B5:7A	PLY	
1B6:F4 00 00	PEA 0000	
1B9:22 0E 32 01	JSL 01320E	
1BD:7A	PLY	
1BE:A5 F4	LDA F4	
1C0:D0 BC	BNE 17E (-44)	
1C2:A9 01 00	LDA #0001	
1C5:8D 28 00	STA 0028	
1C8:3B	TSC	
1C9:18	CLC	
1CA:69 08 00	ADC #0008	
1CD:1B	TCS	
1CE:2B	PLD	
1CF:6B	RTL	Return to caller

So now I need to find the routine that would compare the returned sums to known benchmark values. So I scanned the file for references to 0030 and 0032 and found the following code in the first block ($508) of the file.

194:0B	PHD		
195:3B	TSC		
196:38	SEC		
197:E9 FB 00	SBC #00FB		
19A:5B	TCD		
19B:69 F4 00	ADC #00F4		
19E:1B	TCS		
19F:AD 30 00	LDA 0030	Load sum for track $20
1A2:38	SEC	
1A3:E9 40 1F	SBC #1F40	Subtract lowest limit
1A6:F0 0C	BEQ 1B4 (+0C)	Equal is a bad copy
1A8:70 03	BVS 1AD (+03)	
1AA:49 00 80	EOR #8000	Now check if too low
1AD:10 05	BPL 1B4 (+05)	Sum too low, then bad copy
1AF:9C 26 00	STZ 0026	Set flag for good copy!!!
1B2:80 05	BRA 1B9 (+05)	Now check track $21
1B4:A9 00 00	LDA #0000	
1B7:80 11	BRA 1CA (+11)	Goto end of routine
1B9:AD 32 00	LDA 0032	Load sum for track $21
1BC:38	SEC	
1BD:E9 78 1E	SBC #1E78	Subtract lowest limit
1C0:70 03	BVS 1C5 (+03)	
1C2:49 00 80	EOR #8000	Now check if too low
1C5:30 03	BMI 1CA (+03)	Sum to low, then bad copy
1C7:9C 26 00	STZ 0026	Set flag for good copy!!!
1CA:A8	TAY	
1CB:3B	TSC	
1CC:18	CLC	
1CD:69 06 00	ADC #0006	
1D0:1B	TCS	
1D1:98	TYA	
1D2:2B	PLD	
1D3:6B	RTL	Return to the caller
1D4:0B	PHD	Start of routine to check flag
1D5:3B	TSC	
1D6:38	SEC	
1D7:E9 FB 00	SBC #00FB	
1DA:5B	TCD	
1DB:69 F2 00	ADC #00F2	
1DE:1B	TCS	
1DF:AD 26 00	LDA 0026	Load pass/fail flag
1E2:F0 39	BEQ 01D (+39)	Only zero passes!
1E4:F4 E8 03	PEA 03E8	Routines to set up crash
1E7:22 3B 6F 05	JSL 056F3B	later in the game
1EB:7A	PLY	
1EC:48	PHA	
1ED:F4 00 7D	PEA 7D00	
1F0:22 3B 6F 05	JSL 056F3B	
1F4:7A	PLY	
1F5:0A	ASL	
1F6:A2 00 00	LDX #0000	
1F9:DA	PHX	
1FA:48	PHA	
1FB:A9 DC 02	LDA #02DC	
1FE:A2 DC 02	LDX #02DC	
001:22 95 4D 00	JSL 004D95	
005:68	PLA	
006:FA	PLX	
007:85 F6	STA F6	
009:86 F8	STX F8	
00B:68	PLA	
00C:87 F6	STA [F6]	
00E:A5 F4	LDA F4	
010:E6 F4	INC F4	
012:38	SEC	
013:E9 D0 07	SBC #07D0	
016:70 03	BVS 01B (+03)	
018:49 00 80	EOR #8000	
01B:10 C7	BPL 1E4 (-39)	
01D:3B	TSC	Continue for the real game
01E:18	CLC	
01F:69 08 00	ADC #0008	
022:1B	TCS	
023:2B	PLD	
024:6B	RTL	Return to caller

You can see from the above listed code the only thing that really needs to be changed is the BEQ 01D (F0 39) at $1E2. However, for technical reasons I decided to make the following changes. First, the nibble count routine should never be run, so it was disable by putting a RTL (ReTurn from Long subroutine) at byte $10D of block $573; the actual start of the nibble counting routine. Second the compare code will always fail due to the copied disks, so the actual call to the routine was disabled. Third, the actual call to (0026) should equal zero, so the LDA instruction is changed to STZ (store zero) and the BEQ is changed to BRA (branch always).

Note: I back traced the flag setting routine to it's original caller (Block $5E8, byte $97 from 22 94 01 01 to AF 94 01 01) and bypassed it there.

I think either edit would work fine, but I decided that setting the flag is the best way to do it.

With these three edits a very tricky protection scheme is totally bypassed. I play tested the resulting copy for an hour (through two games as far as I could get) and didn't encounter any bombs. The step by step method:

1. Make a copy of both disks.

2. Make the following edits to a copy of the boot disk.

Blk	Byte	From	To
$508	$1DF	AD 26 00	9C 26 00
	$1E2	F0 39	80 39
$573	$10D	0B	6B
$627	$1B4	22 54 01 01	AF 54 01 01

Don't forget to write the blocks back to the copy disk. Store the originals in a safe place. Play off the deprotected copies.

A final note: I think the game should be completely hard drive compatible with the absence of the copy protection.

Softkey for...

Geometry v1.0
Broderbund

Requirements:
512K Apple IIgs
3.5" Disk copier
3.5" Disk editor

GeometryGS (GGS) from Broderbund/Sensei is a three disk package that is designed to teach you geometry at your own pace. The package uses a KEY DISK protection in the form of a nibble count on disk three. Disk one is simply a system disk to launch the geometry programs from disk two and disk three. When you run the program off disk two it asks you to insert disk three for nibble count. However, when you run the program from disk three, it proceeds to the lessons. So only disk three is being checked for.

I remembered that Broderbund used the standard 3.5" nibble counting routine on Showoff and software companies tend to use the same protection routines a couple of times. With this in mind I began by searching for the usual A2 20 A0 01 and found the routine on block $32D (and on the last half on block $32F), it looks like this:

194:08	PHP		
195:E2 30	SEP #30	Set 8 bit Acc. & registers
197:A2 20	LDX #20	Load track number
199:A0 01	LDY #01	and side
19B:8B	PHB	
19C:4B	PHK	
19D:AB	PLB	
19E:20 A6 01	JSR 01A6	Go to the next step
1A1:D0 23	BNE 1C6 (+23)	Accum = 0 means no errors
1A3:8A	TXA	
1A4:8D D7 01	STA 01D7	Store first half of sum
1A7:98	TYA	
1A8:8D D8 01	STA 01D8	Store the second half of track $20
1AB:0D D7 01	ORA 01D7	
1AE:F0 16	BEQ 1C6 (+16)	Failed if this branch is taken
1B0:A2 21	LDX #21	Now lets do track $21
1B2:A0 01	LDY #01	and the side
1B4:20 A6 01	JSR 01A6	One step closer to the nibble count
1B7:D0 0D	BNE 1C6 (+0D)	Accum = 0 means no errors
1B9:8A	TXA	
1BA:8D DA 01	STA 01DA	Store first half of sum
1BD:98	TYA	
1BE:8D DB 01	STA 01DB	Store the second half for track $21
1C1:0D DA 01	ORA 01DA	
1C4:D0 13	BNE 1D9 (+13)	
1C6:48	PHA	Push Acc for a second
1C7:A9 33	LDA #33	Load "funny" value
1C9:8D D7 01	STA 01D7	
1CC:8D D8 01	STA 01D8	
1CF:8D DA 01	STA 01DA	
1D2:8D DB 01	STA 01DB	Change sums to 3333
1D5:68	PLA	Get the old Accum back
1D6:82 02 00	BRL 1DB (+0002)	
1D9:A9 00	LDA #00	
1DB:AB	PLB	
1DC:8F 00 00 00	STA 000000	
1E0:8F 00 00 00	STA 000000	
1E4:28	PLP	
1E5:6B	RTL	Return to caller
1E6:5A	PHY	Push side (this is one step closer)
1E7:DA	PHX	Push track
1E8:F4 CF 01	PEA 01CF	
1EB:F4 CF 01	PEA 01CF	Push disk volume/name
1EE:22 00 00 00	JSL 000000	Count them up
1F2:8D D5 01	STA 01D5	Store Accum for a sec.
1F5:68	PLA	
1F6:68	PLA	
1F7:68	PLA	
1F8:68	PLA	
1F9:68	PLA	Pull all extra values
1FA:68	PLA	off the stack
1FB:AD D5 01	LDA 01D5	Get the old value back into the Accum
1FE:60	RTS	Return to sender
1FF:8B	PHB	
000:4B	PHK	
001:AB	PLB	
002:AD D7 01	LDA 01D7	Load nibble count sum for track $20
005:AB	PLB	
006:6B	RTL	Then return
007:8B	PHB	
008:4B	PHK	
009:AB	PLB	
00A:AD DA 01	LDA 01DA	Load nibble count sum for track $21
00D:AB	PLB	

```
00E:6B          RTL              Then return
00F:4449534B3300                 DISK3  name/volume in ASCII
```

That was the nibble counting routine, now I back traced the program to see where it was called from. I came across a section of code that calls the nibble count and then compares the returned values. This new routine starts at byte $1A5 on block $406 and continues through to byte $AD on block $407. The important parts look like this (on the disk):

```
1DF:22 00 00 00  JSL 000000   Goes to the nibble
                              counting section
1E3:22 00 00 00  JSL 000000   Goes to 1FF in the
                              above code section
1E7:85 EA        STA EA       Store track $20 nibble
                              count sum
1E9:22 00 00 00  JSL 000000   Goes to 007 in the
                              above code section
1ED:85 E8        STA E8       Store track $21 nibble
                              count sum
1EF:AD 00 00     LDA 0000
1F2:8D 00 00     STA 0000
1F5:AD 00 00     LDA 0000
1F8:D0 3E        BNE 038 (+3E)
1FA:A5 EA        LDA EA       Load track $20 nibble
1FC:38           SEC          count sum
1FD:E9 40 1F     SBC #1F40    Compare against low
                              end of 1F40
000:70 03        BVS 005 (+03) So far so good
002:49 00 80     EOR #8000
005:10 31        BPL 038 (+31) branch if failed
007:A5 EA        LDA EA       Reload track $20 sum
009:38           SEC
00A:E9 D0 20     SBC #20D0    Compare against high
                              end of 20D0
00D:F0 07        BEQ 016 (+07) Ok, still going
00F:70 03        BVS 014 (+03)
011:49 00 80     EOR #8000
014:30 22        BPL 038 (+22) branch if failed
016:A5 E8        LDA E8       Load track $21 nibble
018:38           SEC          count sum
019:E9 B0 1D     SBC #1DB0    Compare against low
                              end of 1DB0
01C:70 03        BVS 021 (+03) It's still good enough
01E:49 00 80     EOR #8000
021:10 15        BPL 038 (+15) branch if failed
023:A5 E8        LDA E8       Reload track $21 sum
025:38           SEC
026:E9 78 1E     SBC #1E78    Compare against high
                              end of 1E78
029:D0 03        BNE 02E (+03)
02B:82 68 00     BRL 096 (+0068) If it gets this far it's a
                              good copy
02E:70 03        BVS 033 (+03)
030:49 00 80     EOR #8000
033:30 03        BPL 038 (+03) branch if failed
036:82 55 00     BRL 096 (+0055) It must be an original
                              if it gets here
038:AD 00 00     LDA 0000
```

I then proceeded to back trace this routine to it's original caller. I was rewarded with JSL 000D8E (22 8E 0D 00) on block $408 (on disk two). So changing the JSL instruction to a LDA results in a kracked copy. I found the exact same code on disk three but in a different place.

However, you still had to insert disk three when launching the program on disk two. Or, if you launched either program from your hard drive you where prompted to insert disk three. I would normally hit the cancel button and things would go along just fine. Then, when I was typing up this article, I decided to take another look at the code. Here is what I figured out (block $408 on disk two):

```
85:F4 00 00      PEA 0000     Push memory location
                              of volume name
88:F4 00 00      PEA 0000     Push the other half
8B:22 00 00 00   JSL 000000   If not on disk 3, ask for it
8F:7A            PLY          Pull off the two bytes
90:7A            PLY          pushed on
91:D4 F0         PEI F0       Push some information
93:22 8E 0D 00   JSL 000D8E   Do the nibble count
                              routines above
97:7A            PLY          Pull the pushed
                              information off
```

So I go out my old copies and made an additional patch and upload the program files to my hard drive. Everything loaded in just fine, and I was never prompted for disk three again, whether launched from 3.5" disks or a hard drive. The complete edits are as follows:

1. Copy all three disks.
2. Make the following changes by disk:
   On disk two:

Blk	Byte	From	To
$408	$8B	22 00 00 00	AF 00 00 00
	$93	22 8E 0D 00	AF 8E 0D 00

   On disk three:

Blk	Byte	From	To
$E7	$1C6	22 00 00 00	AF 00 00 00
	$1CE	22 8E 0D 00	AF 8E 0D 00

Don't forget to write the blocks back to the copies. Store the originals in a safe place. Optional: Upload the program to your hard disk. Learn all about Geometry!

Softkey for...

Downhill Challenge
Broderbund

Requirements:
512K Apple IIgs
3.5" disk copier
3.5" disk editor

Downhill Challenge (DC) from Broderbund is like the name implies a skiing game/simulation. The graphics are good and you control the skier with your mouse so it's easy to play. Of course the reason I'm writing this article is be-

cause the program is copy protected. To start off, the program is published by Broderbund and they have release four (or so) GS programs all using the popular nibble counting scheme. So searching for the ever present A2 20 A0 01 reveals the nibble counting routine on block $5C8. The routine is very much like the one used for Showoff and goes like this (as it is on the disk):

```
075:8B           PHB
076:4B           PHK
077:AB           PLB
078:AF F6 10 00  LDA 0010F6
07C:48           PHA
07D:22 42 0D 00  JSL 000D42
081:68           PLA
082:20 51 0C     JSR 0C51     Do the KEYDISK check
085:AF B5 14 00  LDA 0014B5   Load the flag
089:F0 05        BEQ 090 (+05) Zero means pass/
                              original
08B:20 DE 0C     JSR 0CDE     Print insert master &
                              wait for keypress
08E:80 F2        BRA 082 (-0E) Back up to KEYDISK
                              check
090:22 D1 0D 00  JSL 000DD1
094:AB           PLB
095:6B           RTL          Return to call
096:A9 00 00     LDA #$0000   Load a passing value
099:8F B5 14 00  STA 0014B5   Store in flag
09D:08           PHP  <-----  Patch number 1 goes here
09E:E2 30        SEP #$30     8 bit Accum & regs
0A0:A2 20        LDX #$20     Track $20
0A2:A0 01        LDY #$01     Side
0A4:20 84 0C     JSR 0C84     Go to nibble count
0A7:B0 15        BCS 0BE (+15) Carry set means
                              read error/wrong disk
0A9:20 A3 0C     JSR 0CA3     Go compare bench
                              marks for track $20
0AC:B0 10        BCS 0BE (+10) Nibble count sum
                              didn't pass
0AE:A2 21        LDX #$21     Track $21
0B0:A0 01        LDY #$01     Side
0B2:20 84 0C     JSR 0C84     Go to nibble count
0B5:B0 07        BCS 0BE (+07) Carry set means
                              read error/wrong disk
0B7:20 BF 0C     JSR 0CBF     Go compare bench
                              marks for track $21
0BA:B0 02        BCS 0BE (+02) Nibble count sum
                              didn't pass
0BC:28           PLP
0BD:60           RTS          Return as pass/original
0BE:AF B5 14 00  LDA 0014B5   Load the flag
0C2:1A           INC          Increment the value
0C3:8F B5 14 00  STA 0014B5   Store it back in the flag
0C7:28           PLP
0C8:60           RTS          Return as fail/copy
0C9:8E 13 0D     STX 0D13     Store track number
0CC:8C 14 0D     STY 0D14     Store side
0CF:5A           PHY          Push side
0D0:DA           PHX          Push track
0D1:F4 00 00     PEA 0000
0D4:F4 34 0D     PEA 0D34     Push pointer to disk
                              name
0D7:22 E3 0D 00  JSL 000DE3   Count them up
0DB:8D 15 0D     STA 0D15     Temp storage for Accum
0DE:68           PLA
0DF:68           PLA
0E0:68           PLA
0E1:68           PLA
0E2:68           PLA          Pull all values pushed
0E3:68           PLA          on stack
0E4:AD 15 0D     LDA 0D15     Reload Accum
0E7:60           RTS          Return to sender
0E8:8E 16 0D     STX 0D16     Store first half of nibble
                              count sum
0EB:8C 17 0D     STY 0D17     Store the other half
0EE:08           PHP
0EF:C2 30        REP #$30     16 bit wide Accum &
                              regs
0F1:AD 16 0D     LDA 0D16     Load sum as one 16 bit
                              value (track $20)
0F4:C9 B0 1D     CMP #$1DB0   Compare to low end
0F7:90 08        BCC 101 (+08) Too low then goto fail
0F9:C9 79 1E     CMP #$1E79   Compare to high end
0FC:B0 03        BCS 101 (+03) Too high goto fail
0FE:28           PLP
0FF:18           CLC          Carry clr = sum passed
100:60           RTS          Return
101:28           PLP
102:38           SEC          Carry set = sum failed
103:60           RTS          Return anyway
104:8E 16 0D     STX 0D16     Store first half of nibble
                              count sum
107:8C 17 0D     STY 0D17     Store the other half
10A:08           PHP
10B:C2 30        REP #$30     set 16 bit Accum & regs
10D:AD 16 0D     LDA 0D16     Load as one 16 bit value
110:8D 65 14     STA 1465     Store in "last chance/
                              movement" flag
113:C9 B0 1D     CMP #$1DB0   Compare to low end
116:90 08        BCC 120 (+08) Too low then goto fail
118:C9 79 1E     CMP #$1E79   Compare to high end
11B:B0 03        BCS 120 (+03) Too high, goto fail
11D:28           PLP
11E:18           CLC          Carry clr = sum passed
11F:60           RTS          Return
120:28           PLP
121:38           SEC          Carry set = sum failed
122:60           RTS          Return anyway
123:20 00 0D     JSR 0D00     Decrypt "Insert
                              Master..." text
126:F4 00 00     PEA 0000
129:F4 18 0D     PEA 0D18     Push pointer to text
12C:A2 0C 1C     LDX #$1C0C   Tool = WriteString
12F:22 00 00 E1  JSL E10000   Tool call
133:F4 00 00     PEA 0000
136:F4 01 00     PEA 0001
139:A2 0C 22     LDX #$220C   Tool = ReadChar
13C:22 00 00 E1  JSL E10000   Tool call
140:68           PLA
141:20 00 0D     JSR 0D00     Encrypt "Insert
                              Master..." text
144:60           RTS          Return to caller
```

```
145:E2 20        SEP #$20     8 bit Accum, 16 bit regs
147:A2 1A        LDX #$001A   set count to 26 (dec)
14A:BD 18 0D     LDA 0D18,X   get encrypted character
14D:49 55        EOR #$55     EOR with key
14F:9D 18 0D     STA 0D18,X   Store normal character
152:CA           DEX          decrement count
153:D0 F5        BNE 14A (-0B) do again until zero
155:C2 20        REP #$20
157:60           RTS
158:20           20           0D13 - Track # storage
159:01           01           0D14 - Side # storage
15A:00           00           0D15 - Temp Accum
                              storage
15B:00 00        0000         0D16 - Nibble count
                              sum storage
15D:1B           1B           0D18 - Start of
                              WriteString text
15E:1C 3B 26 30 27            Encrypted "Inser"
163:21 75 11 3A 22            Encrypted "t Dow"
168:3B 1D 3C 39 39            Encrypted "nhill"
16D:75 18 34 26 21            Encrypted " Mast"
172:30 27 75 11 3C            Encrypted "er Di"
177:26 3E                     Encrypted "sk"
       followed by Disk name in low ASCII
179:44 4F 57 4E 48            DOWNH
17E:49 4C 4C 2E 49            ILL.I
183:49 47 53                  IGS
```

That was a nice little routine to follow and comment. Well just like Showoff we want to store the right value (zero) in the flag. So we change the PHP (08) at 09D to RTS (60), this way the first flag is set and the routine returns right away. The actual nibble count (and checking for a disk called DOWNHILL.IIgs) are never run. At this point, if you where to run the game every thing would work just fine, until you tried to move your guy down the slope! The games is no good if you cannot move your man.

If you remember at 110 the STA 14C5, what I call the last chance/movement flag. I tried every way I can think of to find how the program was accessing the flag, but no luck. So I decided to implant the values, that is, write them directly to the disk. I loaded Downhill Challenge into memory and found 14C5 and wrote down the surrounding bytes (CD 00 [00 00] 7C 00 B4 - the brackets show 14C5 in the sequence) and searched the disk for them. I found the right spot and wrote a good value of 1E40 (40 1E on the disk) in that spot. Actually any value between the above bench marks of $1DB0 and $1E79 would work. With the three byte patches installed I tested the program and found everything to work as on the original.

1. Copy the Downhill Challenge game disk.
2. Make the following edits to the copy:

Blk	Byte	From	To
$5C8	$9D	08	60
$5CC	$AA	00 00	40 1E

3. Write the block back to the copy

Downhill Challenge is now completely deprotected and can be run from a hard disk or RAM drive without the need for the original as a KEYDISK.

Softkey for...

Grand Prix Circuit
Accolade

Requirements:
512K Apple IIgs
3.5" disk copier
3.5" disk editor

Grand Prix Circuit (GPC) is racing game of... the grand prix circuit. The program is from Accolade and is somewhat similar to The Duel: Test Drive II also by Accolade. The game is protected is the same fashion as most programs from Accolade and that is nibble counting on tracks $20 & $21 of the 3.5" disk. Searching for standard string (A2 20 A0 01) will reveal the routine on block $112 of GPC. The routine is as follows (on the disk):

```
12F:C2 30        REP #$30     set 16 bit Accum & regs
131:5A           PHY
132:8B           PHB
133:4B           PHK
134:AB           PLB
135:9C 97 B2     STZ B297     Zero nibble count sum
138:E2 30        SEP #$30     set 8 bit Accum & regs
13A:A2 20        LDX #$20     Track $20
13C:A0 01        LDY #$01     Side
13E:20 46 B2     JSR B246     Go to nibble count
141:8E 97 B2     STX B297     half of nibble count sum
144:8C 98 B2     STY B298     Store the other half
147:C2 30        REP #$30     set 16 bit Accum & regs
149:AD 97 B2     LDA B297     Load 16 bit sum
14C:C9 6C 20     CMP #$206C   Compare to low end
14F:90 29        BCC 17A (+29) Too low, goto fail
151:C9 02 21     CMP #$2102   Compare to high end
154:B0 24        BCS 17A (+24) Too high, goto fail
156:E2 30        SEP #$30     8 bit wide Accum & regs
158:A2 21        LDX #$21     Track $21
15A:A0 01        LDY #$01     Side
15C:20 46 B2     JSR B246     Go to nibble count
15F:8E 97 B2     STX B297     Store half of nibble
                              count sum
162:8C 98 B2     STY B298     Store the other half
165:C2 30        REP #$30     16 bit wide Accum &
                              regs
167:AD 97 B2     LDA B297     Load the sum as one 16
                              bit
16A:C9 6C 20     CMP #$206C   Compare to low end
16D:90 0B        BCC 17A (+0B) Too low then goto fail
16F:C9 78 1E     CMP #$1E78   Compare to high end
172:B0 06        BCS 17A (+06) Too high then goto
                              fail
174:C2 30        REP #$30     Make sure we return in
                              16 bit
176:AB           PLB
177:7A           PLY
```

```
178:28           PLP
179:6B           RTL          Return to caller
17A:C2 30        REP #$30     Fail routine starts here
17C:A9 00 D0     LDA #$D000   Load a fail value
17F:8F 9F 35 03  STA 03359F   Store it in a flag
183:AB           PLB
184:7A           PLY
185:28           PLP
186:6B           RTL          Return anyway
187:E2 30 00 00  E2 30 00 00  Extra bytes??? - Not
                              used at all
18B:8E 65 B2     STX B265     Store track
18E:8C 66 B2     STY B266     Store side
191:5A           PHY          Push side on stack
192:DA           PHX          Push track on stack
193:F4 04 00     PEA 0004
196:F4 68 B2     PEA B268     Push pointer to disk
                              name
199:22 E3 E7 04  JSL 04E7E3   Count them up
19D:8D 67 B2     STA B267     Temp store Accum
1A0:68           PLA
1A1:68           PLA
1A2:68           PLA
1A3:68           PLA
1A4:68           PLA
1A5:68           PLA          Pull all pushed on data
1A6:AD 67 B2     LDA B267     Reload Accum
1A9:60           RTS          Return
1AA:20           20           B265 - Track storage
1AB:01           01           B266 - Side storage
1AC:00           00           B267 - Temp Accum
                              storage
1AD:47 50 43     GPC          B268 - Disk name in low
                              ASCII
```

Well that was pretty straight forward code and easy to follow. On a pass condition the routine does not return any special value or data so I back traced the routine to it's caller and made my edit. The call was in the form of JSL 04B1E9 (22 E9 B1 04) and is only found once on the disk. Changing the JSL to a LDA will krack Grand Prix Circuit. Step by Step:

1. Make a copy of the Grand Prix Circuit game disk.
2. Make the following edits to the copy:

Blk	Byte	From	To
$104	$23	22 E9 B1 04	AF E9 B1 04

3. Write the block back to the disk.

Softkey for...

Neuromancer
Interplay

Requirements:
512K Apple IIgs
3.5" disk copier
3.5" disk editor

Neuromancer from Interplay uses a KEYWORD (pirate) copy protection. Although the use of the codewheel is well integrated into the game, it is still a bothersome routine. Every time you try to access the PAX system you must whip out the old codewheel and spin it around. After some digging and some help from a friend we narrowed it down to a single call. Changing the call to three NOPs disables the whole codewheel routine without change to any other aspect of the game. Again, here it is okay to use NOPs as the program is ProDOS 8 based and is not relocatable. To deprotect this one:

1. Make a copy of the Neuromancer game disk.
2. Make the following edits to the copy:

Blk	Byte	From	To
$109	$FE	20 FC 74	EA EA EA

3. Write the block back to disk
   Go kick some ICE.

Softkey for...

USA Geograph v1.0
MECC

Requirements:
768K Apple IIgs
3.5" disk copier
3.5" disk editor

USA Geograph is just like World Geograph in design and copy protection. A simple check for a bad block through ProDOS 16 (22 A8 00 E1 22). For other GS type programs from MECC you might try searching for 90 05 20 and you should see some thing like the "from" column in the edits below. Make the same kind of changes and you should have a kracked copy to use.

1. Make a copy of both disks (ignore errors).
2. Make the following changes to disk one:

Blk	Byte	From	To
$445	$E2	20 52 0B	AD 52 0B
	$E5	90 05	80 03
	$E7	20 5C 0A	AD 5C 0A
	$EA	B0 23	18 EA

3. Write the block back to the copy.

Optional: Upload the program to your hard disk.

Softkey for...

Arkanoid II: Revenge of Doh
Taito

Requirements:
512K Apple IIgs
3.5" disk copier
3.5" disk editor

Arkanoid and Arkanoid II from Taito both use a special signature check for copy protection. This routine was written by NovaLogic (who seems to do program conversions for Taito) and is a GS version of the routine outlined in my Qix article (COMPUTIST #71, p9-10). The easy way

to tell if this routine is being used is to search the disk for 0C 07 03 09 (found on Arkanoid GS, Arkanoid II GS, and Renegade //e).

The CP routine searches for a copy protection header of D5 CC AA then reads the following four bytes and stores them. Then it loops through a routine to find the CP header and compares the four following bytes to the four bytes it read the first time. These special byte have many zeros (I mean MANY, using COPY][+ check the length of any track and compare it to a normal disk) bytes between them. When the hardware tries to read these bytes (with many zero bytes (not just zero bits)) 75% of the time the bytes will NOT match.

This protection cannot be copied with any copy program on the market. In fact it is easier to krack it then back it up. The CP routine has four entry points. At +73 the routines determine the presents of a GS and Smartport. At +A3 the routine calculates the slot and drive number. At +B6 is the actual routine that determines if you have an Apple or Unidisk 3.5" disk and does the actual check. At +1D1 is the routine that adds up the "read-match-flags" and compares them to $0C (12 in decimal). To remove find the first three calls to the CP and disable them, search for A2 05 00 A0 01 00 22 A3 the next byte (say it was a 08) will tell you the other values to search for. That is 22 73 08, 22 A3 08, and 22 B6 08. change each 22 to AF and then find the 0C 07 03 09 and change them to any for bytes, that when added together, are between 01 and 0C (like 04 04 04 00 or 01 01 01 01, etc).

You MUST leave the +1D1 entry point active to let the program read the implanted values (thinking the CP routine put them there). Finally there are two version of Arkanoid II; the early version had some bugs in it, but the same byte strings are there (in different places). The following edits are for the second version:

1. Make a copy of the Arkanoid II game disk.

2. Make the following edits to the copy ONLY:

Blk	Byte	From	To
$32A	$69	22 73 08 00	AF 73 08 00
	$73	22 A3 08 00	AF A3 08 00
	$A5	22 B6 08 00	AF B6 08 00
$3DC	$92	0C 07 03 09	04 04 04 00

3. Write the blocks back to disk.

Now you are asking why are the edits for Arkanoid 1 different then those above (see Issue #70 from "StarBuck", which are my edits anyway). Well if you follow the code as it runs the 22 89 0C 00 becomes 22 B6 09 00, this is done to confuse the kracker. At various points while trying to krack Arkanoid 1 (before I disassembled the whole CP routine) I made edits and tried to boot the game. The program caught on and printed the message about the "Devious and warped software pirate" and the little kicker "it's going to be a long night dude" Imagine someone thought this CP routine so hard to figure out they put in remarks that revive your energy in your quest to remove it! The actual CP routines are quite hard to follow, they use PER +2 (Push Relative) and BRL. This is a relocatable JSR, as PER pushes the relative address two bytes after itself. Then the BRL (which is a three byte instruction) branches to the routine. The routine branched to will end with a RTS and the machine pulls the address pushed on the stack by the PER and adds one to it and continues the program. Basically a manual JSR type call, but fully relocatable without the need to modify each address.

Bug in Crystal Quest Mod (issue #71)

In issue #71 in my article on modifying Crystal Quest (Casady & Greene) there seems to be some instructions missing. You MUST create a NEW subdirectory called CRYSTAL and copy SHAPES, SOUNDS, and SAVE into it. Here are the remaining steps.

Requirements:
512K Apple IIgs
File copy program
Modified Crystal Quest from COMPUTIST #71

Add the following after step 7 (before the tree directory):

8. Format a disk called /TEMP.

9. Copy CRYSTAL.SYS16 to /TEMP.

10. Create a new subdirectory called CRYSTAL on /TEMP.

11. Copy the following files from the Crystal Quest disk into /TEMP/CRYSTAL:
SHAPES
SAVE
SOUNDS

Now the rest of the article should make sense. Sorry about the missing steps, I have many versions of my articles around here and once in a while I send an early incomplete version.

Softkey for...

Three Stooges
Cinemaware

Requirements:
1.25M Apple IIgs
3.5" disk copier
3.5" disk editor

The Three Stooges (TS) from Cinemaware has finally been released for the Apple IIgs. The game has good graphics with some great digitized sounds from actual Three Stooges shows. TS is using a KEYDISK type of copy protection by checking for a bad block on disk one. The routine is simple to find by searching for 22 A8 00 E1 22 00 which is the code for jump to the

ProDOS 16 entry point (machine language interface - MLI) with the command number for a block read. The whole routine looks like this on the disk (Block $13):

```
116:48          PHA
117:F4 FF 7F     PEA 7FFF     Push some data for tool
                              call
11A:A2 08 0F     LDX #0F08
11D:22 00 00 E1  JSL E10000   Go do the tool call
121:A3 01        LDA 01,S
123:EB           XBA
124:29 FF 00     AND #00FF
127:48           PHA
128:20 B4 A2     JSR A2B4     Check to see if we're on
                              a hard disk
12B:68           PLA
12C:C9 01 00     CMP #0001    Anything but one means
                              hard drive
12F:D0 3B        BNE 16C (+3B) Branch past the
                              KEYDISK check
131:22 A8 00 E1  JSL E100A8   ProDOS 16 entry point
                              (MLI)
135:20 00        0020
                              GET_DEVICE_NUMBER
137:71 A2 00 00  0000A271     Memory location of
                              parms for ProDOS call
13B:90 05        BCC 142 (+05) Carry clear means
                              we're on the right disk
13D:20 FC A8     JSR A8FC     Set up to try a different
                              disk
140:80 EF        BRA 131 (-11)Go back and get the
                              device number
142:AD 75 A3     LDA A375     Load the device number
145:8D 77 A3     STA A377     Store in the
                              READ_BLOCK parms
148:A9 00 00     LDA #0000
14B:8D 79 A3     STA A379
14E:A5 54        LDA 54       Load block to read
150:8D 7B A3     STA A37B     Store it in the parms list
153:22 A8 00 E1  JSL E100A8   ProDOS 16 entry point
                              (MLI)
157:22 00        0022         READ_BLOCK
159:77 A3 00 00  0000A377     Memory location of
                              parms for ProDOS call
15D:90 05        BCC 164 (+05) Carry set means NO
                              error (it's copy)
15F:C9 27 00     CMP #0027    Make sure it's an I/O
                              error (bad block)
162:F0 08        BEQ 16C (+08) If it was a bad disk
                              read then continue
164:A9 ED 00     LDA #00ED    Load value for insert
                              master
167:20 03 A9     JSR A903     Ask for "Three Stooges
                              REEL #1"
16A:80 C5        BRA 131 (-3B) Start over & get the
                              device number again
16C:68           PLA          Continue with the game/
                              loading
```

The easiest way to defeat the KEYDISK check is to change byte $12F from BNE (Branch Not Equal) to a BRA (BRanch Always). This way the bad block check is always skipped and the programs continues loading. To make a deprotected backup of The Three Stooges:

1. Make copies of both game disks.

2. Make the follow edits to a COPY of disk one only.

Blk	Byte	From	To
$13	$12F	D0 3B	80 3B

3. Write the block back to the copy of disk one.

Optional: Upload the program to your hard disk as per manual. Go save the orphanage!

Quick and dirty ProDOS 16 READ_BLOCK patch

Some ProDOS 16 (and GS/OS) based programs use a bad block check for the copy protection. Programs that use a simple and direct read block call (22 A8 00 E1 22 00) can be bypassed with very little effort. While working with The Three Stooges (Cinemaware) I came up with the following little trick: A simple "universal" patch for the ProDOS 16 read block command would be to change the: 22 A8 00 E1 22 00 to A9 27 00 38 80 04

This translates into:

```
153:A9 27 00     LDA #0027    Error code value for I/O
                              (read) error
156:38           SEC          The carry must also be
                              set for an error
157:80 04        BRA 15D (+04) Branch over the
                              ProDOS 16 parm
                              pointer
```

The above code emulates the conditions returned from a failed ProDOS 16 read block call. This is done by loading the value of #0027 which is the error code for an I/O error and setting the Carry bit which is also used to determine if an error occurred. The final command (the BRA +04) simply skips over the pointer to the memory location of the data needed for ProDOS 16 call. When the following code checks the carry flag it will assume there was an error of some sort. Even if the code checks to make sure the error was an I/O (read) error, the 0027 in the accumlator will fool that routine into continuing.

The only problem you might possibly run into using this trick, would be if the command number (the 0022) is changed in memory. Then the BRA +04 will be overwritten and when the code is run you will have an unpredictable result (most likely a system crash). There are a few programs that use a single routine to make all ProDOS 16 calls, when this is done the programs modifies the command number and parm location pointer. As always there are no 100% guarantees that the "universal" patch will work, but it's worth try!

The last note: Most programs that use a simple ProDOS read block also use GET_DEVICE (22 A8 00 E1 20) or GET_LAST_DEVICE (22 A8 00 E1 21). If you let that call be completed the

program will ask for the master disk if you are running it from a hard drive. The Get Device call looks for the disk called "disk name" (what ever is in the parameters) and returns the device number (what drive the disk is mounted on) to the code. Then this value is loaded from the Get Device parm table and used in the Read Block call.

This might help when you want to quickly bypass a bad block check CP routine.

Help with Copy Deprotection

I would like to get in touch with people who have the following APPLE programs to krack them for you. I do not want to trade programs, just help you make deprotected backups of those you already own. Letters can be sent to:

Brian A. Troha
P.O. Box 196
Stoughton, WI 53589-0196

Programs I would help with are: Tunnels of Armagedon, National Inspirer, Talking Text Writer GS, Volcanoes v1.8, War in Middle Earth, Word Attack Plus GS and Mavis Beacon Teaches Typing with version numbers higher then 1.5 (versions 1.2 & 1.5 have already been softkeyed).

Anyone with the following apple format programs I would love to see (I never heard of them being released yet): Alcon, Bad Street Brawler, Gladiator, Operation Wolf, Rastan, S.D.I, or and Sky Shark.

Zorro   FL

Bitkey for...

Strike Fleet
Electronic Arts

Requirements:
EDD IV Plus

Many people have been groaning over this almost uncrackable program for some time. Fortunately, there are two ways to make a backup; if you have E.D.D. IV Plus, you can easily make a good, reliable copy using the BIT COPY option. Another way is to use Blain Johnson's Deathlord softkey in COMPUTIST #62. This excellent softkey can convert Strike Fleet's weird format into a normal DOS format; however, the sector edits for Deathlord are untraceable in Strike Fleet, and thus it cannot be completely deprotected until Blain provides some info on exactly what bytes to change. I suspect this same protection scheme is used by Chuck Yeager's AFT, Wasteland, and other newer Electronic Arts releases. Hopefully, someone will find the right bytes and send in the answer, but until then...

Also, if someone can find the time, it might be worthwhile to investigate how games and campaigns are saved by Strike Fleet. As they are in a normal format, it might be advantageous to try and make an APT program to do all sorts of things, like maybe increase the range of your Tomahawk missiles, create a scenario with your one ship against about fifty, etc... (They do get b or i n g after a while, you know). I'd suggest using a blank, formatted disk to save an experimental game on; that way the saved code can be seen without interference from other programs on disk.

To the RDEXed: I have a suggestion which I'd really like you and the readers to consider. Several past issues of COMPUTIST have contained many large, helpful articles on deprotection basics, APT's, etc. for beginners. Rather than printing separate articles, however, why not have some major contributors, like Brian A. Troha or Phil Goetz, or a group of contributors, like "The Hardcore Computists" produce a single issue dedicated exclusively to beginners? Now, I'm not talking about an issue which is sent to everybody, but rather one like the back issues, which may be ordered at will; and, perhaps you could append this beginner's issue every six months to a year or so to keep up with the times? I think this would be a good source of revenue as well, since there will always be beginners out there, as I once was and still am in some ways. In addition, I believe such an amalgamation of expertise crammed into one humongous issue would prove as invaluable to us Apple owners as Beneath Apple DOS/ProDOS, Apple Tech-manuals, and COMPUTIST itself.

To the RDEX subscribers: In COMPUTIST #68, The Executioner provided an address for some fairly cheap 3.5" disks. I've found some that are even cheaper. Write to this address for a catalog:

Computer Direct Inc.
22292 N. Pepper Road
Barrington, IL 60010

From this particular company, 3.5" micro-disks are a paltry $0.59 each in lots of 10. They guarantee a pretty high clip rate, and I've ordered 5.25" disks from them before with no hassles.

The best price on 800K 3.5" disks that I know of is $0.39 each in lots of 25 from:

MEI/Micro Center
1100 Steelwood Rd.
Columbus OH 43212
1 (800) 634-3478

....RDEXed

Also, I've got a public domain word processor which saves all files in the form of ProDOS text files. Since some people have been having trouble with getting their articles in text files, you can just save your writing to disk, and use Copy II Plus to convert it to DOS 3.3, and then send it to COMPUTIST. Incidentally, the program is called FrEdwriter (Free Educational writer). To

get a copy, send a 5.25" disk along with proper postage through the RDEX-ed, and he can relay your inquiry to me.

To Vasant Javasankar: If you have access to it, try using E.D.D. IV Plus. It worked for Strike Fleet, and I'll bet it works for Wasteland too. If you or any other readers don't have E.D.D. IV Plus, and are desperate for a working copy of either Wasteland, Strike Fleet, or any other programs with EA's new protection, write me through the RDEXed, and we can arrange something.

To Eric R. Mayou: You said in COMPUTIST #69 that you had some trouble getting into the monitor with your ROM card in slot 4. Did you remember to flip the switch in the rear of the card? On all Integer BASIC ROM cards, that switch activates the card, and when ctrl-Reset is pressed, control is transferred to the card's ROM.

Peter Green   England

The following softkeys are mainly the result of studying previous softkeys published in Computist — and in the case of one, as mentioned later, luck played a large part! As I am not an assembly language 'expert' I regret that I cannot give detailed information about the deprotection!

In each case, the requirements are a disk copier and a sector editor.

Softkey for...

Great Western Shootout
Brittanica Software

This disk has a bad block as indicated when copying the original with CopyII+. Previous softkeys in Computist have indicated the relevant call used by ProDOS to read a block and this information together with the monitor search routine enabled me to find the protection code.

1. Copy the original disk using a disk copier that will ignore bad blocks. (CopyII+, Diversi-Copy, etc.)

2. With a block editor, search for 20 1C 0E and change the 20 to 60. On my copy this was found at Block $596 Byte $08D.

Softkey for...

The Duel - Test Drive II
Accolade

The disk was deprotected after studying previous softkeys for Accolade software and uses a very similar routine. Trial & error found the correct alteration!

1. Copy the original disk using a disk copier that will ignore bad blocks.

2. With the block editor, change Block $16E Byte $134 from A2 20 to 80 38

Blk	Byte	From	To
16E	134	A2 20	80 38

Softkey for...

Jack Nickalaus' Greatest 18 Holes Of Major Championship Golf
Accolade

This disk is not copy protected but uses a password protection - you have to identify a particular hole from a 'course sheet' which is printed on very dark paper and is virtually un-readable! This is the disk in which luck played a great part! I managed to find part of the protection routine and intended to substitute a 60 (RTS) at a particular byte. I accidentally put it at the wrong byte and was amazed to find that it did the trick.

1. Copy the original disk

2. Using your sector editor and scan the disk for $F4 BD 8D 22 15 2A and change the 22 to 60 — on my disk at Block 8C Byte 022

Note: After using this softkey, you MAY find that, when asked to select a course, you have to enter it twice.

The Terminator   IL

Softkey for...

Test Drive II: The Duel (gs)
Accolade

This game is protected with yet another version of the famous 3.5" disk nibblecount. After working on de-protecting the IIe 128K version of this game, I was expecting a little more of a challenge than this.

This is what I found on Block $16E, at byte $128:

```
PHP                ;Save some registers
REP #30
PHY
PHB
PHK                ;make data bank/program bank
PLB                the same
STZ C597           ;zero return value
SEP #30            ;switch to 8-bit registers
LDX #20            ;track 20,side 1
LDY #01
JSR C540           ;do the check
STX C597           ;store return value
STY C598
REP #30            ;back to 16-bit mode
LDA C597           ;look at return value
CMP #206C          ;less than 206C?
BCC FAIL           ;if yes, go to "fail" exit
CMP #2102          ;greater than 2102?
BCS FAIL           ;if yes, go to "fail" exit
```

```
        SEP #30
        LDX #21        ;now check track 21, side 1
        LDY #01        (pretty much same as above)
        JSR C540
        STX C597
        STY C598
        REP #30
        LDA C597
        CMP #1DB0
        BCC FAIL
        CMP #1E78
        BCS FAIL       ;if track 21 is bad, fail
        REP #30        ;if ok, restore registers from stack
        PLB            and make a clean return
        PLY
        PLP
        RTL
FAIL    REP #30
        LDA #D000      ;it's "D" day for you!
        STA 0235AB     ;store at pass/fail flag...
        PLB            ;restore registers and return.
        PLY
        PLP
        RTL
```

It appears that the check routine will store a $D000 if the disk is a copy, but it will not store anything if the disk is an original. Solution: NOP out the offending "LDA #D000" and the "STA 0235AB".

1. Using your favorite sector editor, load in block $16E, and put $176 put 7 SEA's.

Optional: use your handy sector editor to embed snappy comments where various text messages are stored. I found them around Blocks $140-$160.

In an attempt to increase modularity of cars and scenery, Accolade has sacrificed speed by scattering a host of data files all over the disk. As with most IIgs programs of this type, the disk arm makes a regular rhythm going back and forth between almost 800K of data, often taking as long as 10 seconds just to load in a minuscule 10 or 20 block file. Also, now that I have softkeyed this game, I would like to load it onto my 1-meg RAM card. It only requires 512K, but it CRASHES with a "memory fragmented" error whenever the RAM card is activated in the control panel. The game also hard-codes addresses in banks 2 and 3, so GS/OS cannot be used. The program also shuts down access to the Control Panel/Desk Accessory menu, so you have to reboot and wait another 5 minutes or so for the game to load in if you accidentally leave the system speed on "Normal" or leave Keyboard buffering ON when you want to "drive" with the numeric keypad. (I personally prefer to use the keypad instead of the joystick, because I find that its easier to control.)

The 128K version of this game on a 5.25" disk is also protected. The disk can be read with Copy II Plus's sector editor, when it is set to DOS 3.3 PATCHED mode. Track $21 has a load of errors on it, though. The protection (probably a track synchronization, maybe even half-tracks only) only checks site 1 at bootup time. Side 2 can be COPYAed if you do a POKE 47426,24.

Using the "Visit Monitor" CDA on my IIgs, I was able to capture all of bank 0/1 memory after a successful disk check and save it to disk. Now whenever I want to play the game, I restore all of the memory, insert my bit-copy of the original and pick up from there. If you think this is a half-backwards way of getting around the protection, you are right. If I had more time on my hands I would try to do an actual softkey, but for now, this works for me.

MONRWTS A Read/Write disk routine

I have written something for all the lazier hackers out there — the sector editor for people who hate sector editors. First, type in the hexdump at the end of this article. Next, BSAVE it to your DOS 3.3 utility disk(s). When you BRUN this file, you will have a new set of disk commands at your disposal, attached to the ctrl Y vector in the Monitor.

The syntax is: CTKS.ADDR ctrl Y (return)

```
C =  Command (8=Write,0=Read)
TK= Track (two digits)
S =  Sector (one digit)
ADDR Address (256 byte block to read/write)
```

For example, 110.2000 ctrl Y will read track $11, sector $0 into memory at address $2000. 8001.B700 ctrl Y will write page $B7 to disk at track $00, sector $1. Your command will be confirmed by a quick message and RWTS return code. E.G. when you type:

004F.1300 ctrl Y

MONRWTS responds with:

```
T04 S0F A1300 R
RC=00                          (error code)
```

As you can see, this little utility can be VERY useful for quick editing of a disk, protected or otherwise. It is very convenient on a IIgs where the Monitor has a built-in Hex/text dump, search command, etc.

One day if I am sufficiently bored I will write a ProDOS version which will read/write blocks.

MONRWTS.OBJ

```
0300: A9 0D 8D F9 03 A9 03 8D   $9E35
0308: FA 03 4C BF 9D A5 3C 48   $EAF4
0310: 29 0F 8D ED B7 29 00 8D   $D532
0318: EB B7 68 4A 4A 4A 4A 8D   $9A56
0320: EC B7 A2 01 18 26 3D 90   $797F
0328: 01 E8 8E F4 B7 A5 3D 0A   $9E0B
0330: 0A 0A 29 F0 0D EC B7 8D   $1321
0338: EC B7 A5 3E 8D F0 B7 A5   $4CD2
0340: 3F 8D F1 B7 A9 D4 20 ED   $CA7C
0348: FD AD EC B7 20 DA FD 20   $EC6E
0350: 95 03 A9 D3 20 ED FD AD   $0AC3
```

```
0358: ED B7 20 DA FD 20 95 03   $8A73
0360: A9 C1 20 ED FD AD F1 B7   $3025
0368: 20 DA FD AD F0 B7 20 DA   $2A3F
0370: FD 20 95 03 AE F4 B7 CA   $3F6A
0378: BD 9A 03 20 ED FD 20 E3   $E241
0380: 03 20 B5 B7 A2 03 BD 9C   $38C2
0388: 03 20 ED FD CA 10 F7 AD   $2D55
0390: F5 B7 4C DA FD A9 A0 4C   $1D6D
0398: ED FD D2 D7 BD C3 D2 8D   $D31B
```

Here is the source code in DOS 3.3 Merlin format.

```
* MONRWTS
* Adds RWTS functions to Monitor
* Syntax:CTKS.ADDR^Y
* C = command (8=W,0=R)
* TK = track (two digits)
* S = sector (one digit)
* ADDR = address to R/W
* by The Terminator
* v1.0 - 24/Dec/89
*
                ORG $0300
RESET    =      $9DBF
USRADR   =      $03F9
TSZP     =      $3C
ADDRZP   =      $3E
COUT     =      $FDED
RWTS     =      $B7B5
PREPRWTS =      $03E3
PRBYTE   =      $FDDA
IOBSECT  =      $B7ED
IOBTRK   =      $B7EC
IOBCMD   =      $B7F4
IOBBUFF  =      $B7F0
IOBVOL   =      $B7EB
IOBRETN  =      $B7F5
                LDA #<START
                STA USRADR
                LDA #>START
                STA USRADR+1
                JMP RESET
START    LDA TSZP
                PHA
                AND #$0F
                STA IOBSECT
                AND #$00
                STA IOBVOL
                PLA
                LSR
                LSR
                LSR
                LSR
                STA IOBTRK
                LDX #$01
                CLC
                ROL TSZP+1
                BCC READ
                INX
READ     STX IOBCMD
                LDA TSZP+1
                ASL
                ASL
                ASL
                AND #$F0
                ORA IOBTRK
                STA IOBTRK
                LDA ADDRZP
                STA IOBBUFF
                LDA ADDRZP+1
                STA IOBBUFF+1
                LDA #"T"
                JSR COUT
                LDA IOBTRK
                JSR PRBYTE
                JSR PRSPC
                LDA #"S"
                JSR COUT
                LDA IOBSECT
                JSR PRBYTE
                JSR PRSPC
                LDA #"A"
                JSR COUT
                LDA IOBBUFF+1
                JSR PRBYTE
                LDA IOBBUFF
                JSR PRBYTE
                JSR PRSPC
                LDX IOBCMD
                DEX
                LDA ISRW,X
                JSR COUT
                JSR PREPRWTS
                JSR RWTS
                LDX #$03
PRRC     LDA RCMSG,X
                JSR COUT
                DEX
                BPL PRRC
                LDA IOBRETN
                JMP PRBYTE
PRSPC    LDA #$A0
                JMP COUT
ISRW     DFB "R","W"
RCMSG    ASC "=CR"
                DFB $8D
```

Playing Tip for...

Zork Zero
Infocom

(These tips supplement the on-line hints built into the game. If you do what the on-line hints suggest, you should be able to solve the game pretty easily. My tips will merely cut down on the frustration of losing progress due to simple mistakes.)

Although the on-line hints are helpful, they are vague and can sometimes mess you up. This game involves solving a "pyramid" of puzzles,

leading up to the grand finale of stopping the curse. You often need something "from another part of the game" to solve the various puzzles. There is a logical order to everything, so try not to go insane running around making sure you have done everything correctly.

Before you do anything, get your permanent light source. Then, go to the village and get your pigeon and perch. Collect all of the items from the village area and return to the castle. Drop everything. Go to Dimwitt's magic clothes closet and get the magic cloak. Use the magic cloak (as I will explain later) to store every last object you find.

Work on one area of the game at a time. Solve ALL of the puzzles. After you have raided the castle, Activate the Oracle (as explained in the on-line hints) and begin work "beyond" the oracle.

To find your way around the delta, drop the three orbs that weren't used in Zilbeetha's puzzle. You don't need the remaining three Orbs for anything.

Carry these four things around with you at all times: the pigeon, the candle, the magic cloak, and the brass lantern — once you have gotten it from the pits. A major problem with this game is figuring out where to put everything you find, since you cannot carry everything around with you all of the time. As you have probably discovered already, when you wear the cloak you go to the Plain. As you probably may have not discovered, you can drop objects in the plain, remove the cloak, and wear the cloak whenever you need to retrieve an object. (This is ideal for hiding the lantern from the giant crow in the Aerie.)

If you are like me, you may have gotten a "second-hand" copy of this game. In that case, some of the package may be missing. You may not have the valuable calendar, parchment, or map which comes with Zork Zero. If you are one of those people, you will want to know that the blue toad's name is Otto, Frank Lloyd Flathead's relocated office in on the 19th floor south, and three undertrumps after an opponent's discard of a trebled fromp is an indefensible gambit. Next, draw yourself an 8x8 matrix, resembling a chessboard. Number each square from 0 to 63, starting in the upper left corner, working across. What you have just drawn is a map of the construction site. The hardhat (which you need to enter the granola mine in antharia) is in lot 0. You will enter the site at lot 47, which is 2 lots up from the lower right corner. (be sure you are carrying the FroBozz magic passages) Starting in lot 47, Go SW,SE,W,W,N,NE,N. You now should be in lot 38. Install the NW/SE passage in the NW wall. Go NW,NE,NE. You are now in lot 15. Install the N/S passage in the N wall. Go N,W,SW,SW ,SW,W,NW. You now should be in lot 17. Follow the on-line hints from here on out.

A technical hint: replace Infocom's annoying modified ProDOS with a standard ProDOS Kernal. Since it is not copy-protected, you might want to copy all of the files to a single 3.5" disk and use Diversi-Cache if you have a IIgs.

Joe Trodello   MA

Softkey for...
The Children's Writing and Publishing Center
The Learning Company.

Requirements:
Original disk
DOS 3.3 system disk
3 blank sides
COPYA

This was a very easy program to copy, fortunately. My first attempt, which was to use Copy II Plus's autocopy, was unsuccessful. Since this failed, I decided to try COPYA ignoring epilog and checksum errors. It worked! This is necessary only on the program disk. All other disks are unprotected and can be copied with any disk copy program.

My version of the program was 1.1 on the program disk, and v.1.0 on the picture and storage disks. The manual was dated 11/88.

1. Boot your DOS 3.3 system disk.

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

POKE 47426,24
RUN COPYA

3. Copy the picture and storage disks.

Rob Fiduccia   MD

I am a proud new owner of an Apple IIgs this Christmas, and have some questions that have risen from getting it. I hope RDEXed can help or you the readers.

⑦I have a question on the IIgs's capability to change the text, background and border colors. It is very simple from the Control Panel, but how about from a Applesoft BASIC program in Pro-DOS and/or DOS 3.3? I feel being able to alter these colors would be a new flexibility when I program. I have heard it is a few pokes, but don't know off hand what these pokes are. Can someone help me?

⑦Is there a way in Visit Monitor from the Control Panel to search for a string or a hex string? For example, if I want to find the bytes $00 $67 and $B1 and don't want to look at each and every byte in memory from $0000 through $FFFF, how could I do it? If there is a search command, how do I use it, exactly?

Deathlord Scenario Problem from COMPUTIST #62

⑦I was trying to crack DEATHLORD from ECA, but had no luck on my own. I looked through my odd issues of COMPUTIST, I found one in COMPUTIST #62 by Blain Johnson on page 11 and 12. I typed in all the programs and hex dumps and made sure they were all typed in correctly. After copying the BOOT disk, I made the sector edits, which worked fine. Now comes the problem. When coping the SCENARIO disks A and B, and then booting up the game, when the game asked for the SCENARIO disk, I inserted it and it doesn't accept it. I did it two more times but it still didn't work. So I tried to deprotect my protected SCENARIOS with the controller. But when the game asked for the SCENARIO disk, the message just flashed and asked again. What is wrong? I have to know? Has this happened to anyone else? HELP!!

To Zorro: Thanks for writing regarding your questions on Ultima V.

Ultima IV HELP

To Joey Johnson: You asked (COMPUTIST #69) some questions relating to Ultima IV. From reading it, I knew the answer right away. To obtain the SKULL of Mondain, you must first have a ship. A sextant (item D at a guild) will help greatly, but it is up to you. Then sail to the volcano's lava that has surfaced from the evil from the skull. The latitude is P'F" and the longitude is M'F". The sextant isn't hard to learn, if you know what latitude and longitude are. When you are at the correct location, wait there for two new moons (you won't see anything but black where the moons are shown). Then SEARCH anytime while the moons are new to get the SKULL.

Now what you what to do with the skull is up to you, in a way. To win the game, you must destroy it. To destroy the skull, stand on top of the Staggering Abyss on USE it. I'll let you find the Abyss.

You also asked about the stones. To understand the stones, you must first understand the virtues before you can REALLY USE them. Stones have color. These colors represent a virtue of the Avatar. They rest in the dungeons in Britannia on altars. Simply have a suitable party (if you are not cheating) and a good handful of gems, 99 will do, if you have the gold. Then enter a dungeon. Go through the ENTIRE dungeon and peer with a gem to find the altar. Once you find the altar, go right on top of it and SEARCH. You will then be shown what stone color you've found, if there is a stone on it.

The stones have restricted purposes. So you can't USE them whenever you like. The stones are a huge part of the quest, and I feel if I tell you anymore it'll bore the game for you. But I will tell you this. You'll need the stones to make the 3 PART KEY to enter the Codex.

And what are the fountains in the dungeons for, you ask. Partly in the line of decoration, or maybe just spunk. To see what a fountain does, you must SEARCH on it. There are four types of fountains in the game. "Poison", "BAD taste!", "Hmmmm", and "AHH refreshing". The "poison" fountain gets you poisoned, the "BAD taste!" fountain takes some hit points away, the "Hmmmm" fountain does nothing at all and the "AHH refreshing" fountain heals all wounds. Do remember that ONLY the drinker will be affected.

Hope I've answered the questions you asked about. If you really need more help, I suggest you order COMPUTIST #58. It has a superb indepth guide on Ultima IV by Jason Cobb.

To Jonathan Trappe: In COMPUTIST #69, you gave some notes on Ultima V to Brandon LaCava; page 9. You said, "what Badge?", "I went through the whole game without finding it". I feel sorry for you. The badge isn't a necessity, but a great luxury. You use the badge in Blackthorn's castle to make the guards think you are one of them, or on their side. Exploring the dark paths of Blackthorn's palace may be quite hazardous to the health of one who is not instantly recognizable as a member of the Oppression. Elistaria of Windemere (at latitude A'I" and longitude P'I") will give you a Black Badge which, when worn, will save you from the scrutiny of Lord Blackthorn's foul guards. Be forewarned, though: she will require much of you for this favor, perhaps even thy virtue.

Marc Batchelor   FL

Softkey for...
Charlie Brown's ABC's
?

Requirements:
A method to get into the monitor
Demuffin Plus
Blank Disk
Fast DOS (I used Pronto DOS)
Sector Editor (Optional)

I was given this program to de-protect a few weeks ago by a teacher friend of mine. It really wasn't that difficult to de-protect, but I ran into problems on it's title screen. The program reads the registered owners name from Track 1. Since I was using Pronto DOS, the title screen had garbage where the name should have been. At first I thought that this might be OK. I rapidly changed my mind, and I'll explain how I took care of this after we crack the disk.

1. Format a disk using a fast DOS.
INIT HELLO

2. Boot the disk, and when you see the Applesoft prompt "]", enter the monitor.

3. Move RWTS to a safe place.

2800<B800.BFFFM

4. Boot your disk with Demuffin Plus and load it in.

BLOAD DEMUFFIN PLUS,A$803

5. Enter the monitor and disable DOS.

CALL-151
FF59G

6. Move the altered DOS back into place.

B800<2800.2FFFM

7. Start Demuffin Plus.

803G

8. Copy all files to your freshly formatted disk.

You will now have a disk that functions, but it will have garbage on the screen instead of the registered owners name. Our next task is to take care of this problem.

Sector Editor Method

1. Scan the disk (Cracked Copy) for the following HEX bytes: 20 02 09 AD 72 AA 8D 7A 10 AD 73 AA 8D 7B 10

2. At address $04, NOP to $0E.

EA EA EA EA EA EA EA EA EA EA

3. At address $3C, change to: 20 28 09

4. Write the sector back out to the disk.

5. Scan the disk (Cracked Copy) for the following HEX bytes: 4C A1 08 BD AE 09 8D 1B 09 BD B8 09

6. At address $29, type the following HEX bytes:
A2 00 BD 37 09 9D 00 02 C9 00 F0 26 E8 D0 F3

7. At address $38, type in the full registered owners name. The name must be terminated with a HEX $00. Thus, if I were to use my name, it would look like: Marc D. Batchelor00

8. If the name does not extend to address $5B, NOP up to and including $5A.

9. At $5B, type in the following HEX bytes:
A9 00 85 48 60

10. Write the sector out to the disk.

File Method

1. Boot your DOS disk, and BLOAD the file STEX on the ABC's disk.

BLOAD STEX

2. Type the following:

803:EA N 804<803.80DM
83B:20 28 09
928:A2 00 BD 37 09 9D 00 02 C9 00 F0 26 E8 D0 F3

3. Figure the HEX equivalent of the owners Name, and type in those HEX bytes, starting at address $937.

4. Type in the following:
A9 00 85 48 60

5. Find the BLOAD length.

AA A0.AA61   *returns with addr: Hi Lo*

6. BSAVE the file back onto the disk.

BSAVE STEX,A$803,L$LLHH

That should do it for this one.

Softkey for...

Operation Frog
Scholastic

Requirements:
A way into the monitor
Blank Disk
Demuffin Plus
Fast DOS (NOT Pronto DOS)

I went into fits over this program and Pronto DOS (PDOS). I assumed that PDOS looked just like DOS 3.3 to programs, but was much faster. I am certain that PDOS is not at fault in the matter. Scholastic uses non-standard routines to access the file manager, and I believe that is the root of the problem. For a fast DOS, I used the fast load enhancement by Thomas N. Burt, published in Nibble's "More Apple Secrets". This is apparently more transparent to programs than PDOS.

1. Initialize a disk with a fast DOS.

2. Boot Operation Frog, and when the prompt "]" appears, break into the monitor.

3. Move RWTS to a safe location.

2800<B800.BFFFM

4. Boot disk containing Demuffin Plus.

5. BLOAD Demuffin plus.

BLOAD DEMUFFIN PLUS,A$803

6. Disable DOS, and move Operation Frog's RWTS into place.

FF59G
B800<2800.2FFFM

7. Startup Demuffin Plus and copy all files.

803G

Softkey for...

Study Skills
Self Exploration

Requirements:
A way to get into the monitor
Demuffin Plus
Blank Disk
Fast DOS (Pronto DOS)

1. Initialize disk with a fast DOS.

2. Boot Study Skills and when the prompt "]" appears, break into the monitor.

3. Move RWTS to a safe location.

2800<B800.BFFFM

4. Boot up disk with Demuffin Plus, and load the program.

BLOAD DEMUFFIN PLUS,A$803

5. Disable DOS 3.3, and move Study Skills RWTS in place.

FF59G
B800<2800.2FFFM

6. Startup Demuffin Plus and copy all files.

803G

Softkey for...

Chem Lab
?

Requirements:
File Copier (I Used Copy][+)
Disk Copier (I Used Copy][+)
Fast DOS (Not Pronto DOS)

These disks are COPYA-able, but the resulting copies will not boot. I first formatted a disk under Pronto-DOS and copied all files from the original side A to the formatted side A. Booting this copy resulted in a crash. I tried to trace the code and spent about a day on it before deciding to try another fast DOS. I used the fast load enhancement by Thomas N. Burt, published in Nibble's "More Apple Secrets". This worked wonderfully, leaving a fully deprotected program. If you don't have the aforementioned book, I recommend it as well as the other two in the same series.

1. Format both sides of a Blank disk with the DOS of your choice (Not Pronto DOS).

2. Copy files from side A of the original to side A of your formatted disk.

3. Copy side B of the original to side B of the formatted disk using whole disk copier.

Softkey for...

The Design Your Own Home Series
Avant-Garde

Requirements:
A way into the monitor
Demuffin Plus
Blank Disks
Fast DOS (Pronto-DOS)

The three Design Your Own Home (DYOH) programs covered here are: Architectural Design, Interior Design, and Landscape Design (Arch, Int, Land respectively for short). The RWTS on all three disks is identical. But just capturing the RWTS and Demuffining the files over is not all that is required to crack these disks. On all disks, line 0 of the HELLO program sets the run flag (214) to 214 (POKE 214,214) and messes with the reset vector. Also, in each of the main program files, there are two CALLs to RWTS that must be disabled. The first CALL is to 47721 ($BA69), and the other is to 47741 ($BA7D). The CALLs are ALWAYS located on lines 21000 and 20000 respectively. Examining the code at $BA69 shows:

BA69:A9 AB	LDA	#$AB	Set up to read
BA6B:8D 4B B8	STA	$B84B	Original disk with
BA6E:A9 FF	LDA	#$FF	altered marks and
BA70:20 DF BC	JSR	$BCDF	translation tables.
BA73:20 EC BC	JSR	$BCEC	
BA76:A9 AA	LDA	#$AA	
BA78:8D 29 BA	STA	$BA29	
BA7B:60	RTS		
BA7C:60	RTS		
BA7D:A9 FF	LDA	#$FF	Set up to read
BA7F:8D 4B B8	STA	$B84B	standard format
BA82:A9 DE	LDA	#$DE	for data disks.
BA84:20 DF BC	JSR	$BCDF	
BA87:A9 AA	LDA	#$AA	
BA89:20 EC BC	JSR	$BCEC	
BA8C:A9 96	LDA	#$96	
BA8E:8D 29 BA	STA	$BA29	
BA91:60	RTS		

Since we have installed our own DOS, we can't have the program calling these locations.

1. Initialize the front and back of a blank disk (one for each module) preferably with a fast DOS.

INIT HELLO
DELETE HELLO

2. Boot one of the protected modules, and when you see the picture, drop into the monitor.

3. Move the RWTS to safety.

2800<B800.BFFFM

4. Boot your disk that contains Demuffin Plus and BLOAD it.

6 ctrl P
BLOAD DEMUFFIN PLUS

5. Enter the monitor and disable DOS.

CALL-161   *Yes, I do mean CALL-161*

6. Move RWTS into place.

B800<2800.2FFFM

7. Run Demuffin Plus and Copy all files, front and back.

803G

8. Repeat step 7 for each module that you have.

9. Boot a fresh DOS. It is time to make some necessary modifications to the programs.

10a. On all disks and all sides, LOAD HELLO and make the following change:

0 HOME:GOTO 5

10b. SAVE HELLO back to disk.

Repeat step 10a and 10b for each side of every module.

11. Make the following changes to the following files:

Disk: Architectural Design

Program name	Line#	Remove
ARCH.DESIGN.P	20000	CALL 47741
	21000	CALL 47721

Disk: Landscape Design

Program name	Line#	Remove
DEC1	20000	CALL 47741
	21000	CALL 47721
DEC2	20000	CALL 47741
	21000	CALL 47721
DEC3	20000	CALL 47741
	21000	CALL 47721
DEC4	20000	CALL 47741
	21000	CALL 47721
HPDRAW	20000	CALL 47741
	21000	CALL 47721

Disk: Interior Design

Program name	Line#	Remove
DEC1	20000	CALL 47741
	21000	CALL 47721
DEC2	20000	CALL 47741
	21000	CALL 47721
DEC3	20000	CALL 47741
	21000	CALL 47721
DEC4	20000	CALL 47741
	21000	CALL 47721

Remember, these modifications are to be made to both sides of the disk.
That's all folks.

Ed Croft   IL

Notes on Disk Muncher

I read in issue #70 about the questions concerning the Disk Muncher copier. I went through my doc disks and found this info. I don't know if the BBS number at the end of the file is good or not since my modem is down, but dialing for the number I've gotten a busy signal (which is usually a good sign).

```
Disk Muncher 1.1
The ultimate in fast copiers
Written by
The Stack
Documentation by:
The Inspector
Another Great program brought to you by
Corrupt Computing
If you have any questions, comments, or
concerns, please direct them to either The In-
spector or The Stack on "The Corrupt Com-
munications Bulletin Board". 313-453-9183
- 24hrs.
```

Mike Paterno   CT

I wish to voice my no copy protection speech again. I didn't go out and spend $1000.00+ for a hard drive so I would have a thousand "KEY" disks cluttering up the desk. "Hmmmmm where did I put that d*@#$m key disk last"

The two programs "MECC World Geograph" and "MECC U.S.A Geograph" are "excellent GS programs", and I wouldn't hesitate to give them a grade of "A+".

I give most of the credit for the following softkeys to Don McClelland; because without his help neither of the softkeys would be possible.

Softkey for...

World Geograph v1.1
MECC

Using Copy II Plus v9 make a copy of World Geograph using the 3.5" parameters included on the disk (World Geograph HD); it copies fine, but doesn't remove the key disk call. Using the sector editor make the following edits. Block 0067 search for 18 60 38 60; change 38 to 18. Block 0068 search for 18 60 38 60; change 38 to 18. I don't believe you need to change both sets of bytes, but not being sure which, I changed both. Write the changes back to the disk.

Run the program before you attempt to make a copy, so it will write the correct data back to Blk 008; then enjoy. On a Hard Drive and system 5.02 this program flies.

Softkey for...

U.S.A. Geograph v1.0
MECC

Using Finder from system 5.02, copy the program file "USA.Geograph" to a freshly formatted 3.5" disk. Using the Copy II sector editor make the following edit; Block 0083, search for 18 60 38 60; change 38 to 18 and write the change back to disk (don't forget to hit return). Copy the rest of the files to a new disk, and it is done.

Run the program before you attempt to make a copy, again so it will write the correct data back to BLK 0008. Voila, it is fini.

Neither information disk is copy protected. I haven't checked all the features, but I suspect the softkey's will work.

The Mailman   OH

This is my first contribution to Computist. I've found Computist to be informative in many ways — a big help to a person in computing for less than 2 years.

Softkey for...

Jack Nickolas Greatest 18 Holes of Golf
Accolade

Requirements:
Whole disk copier
block editor (I used Copy II Plus)

Make a backup of JNG. Scan the backup for the code F0 04 22 BA 03 00 AD B2. I found mine on Block ($0092), byte 07F. Change the F0 to 80 and 22 to AF. Write it back to the disk. Now you

---

can "throw away" (store it with your original) and play the game without having to type in a course number from the deep maroon sheet and ruining your eyesight in the process.

Softkey for...

Battle Chess
Interplay

Requirements:
Whole disk copier
block editor

Same type of protection as Jack Nickolas Golf in that you need to type in a chess move from the manual. (A particular move from a certain game and notation.)

Scan the disk for 80 0C C2 30 C6 0C F0 03 4C 24 AB 4C 76 3D. Mine was on Block $0419 byte 16A. Change all of the code to EA's except the C2 30 C6 0C. Write it back to the disk. Now when the program asks for the input of chess move, just press return and enjoy an unusual game of chess.

Softkey for...

Stickybear Shapes GS
Optimum Resources

Requirements:
Sector copy
block editor

Sector copy the original disk, recopying any tracks with errors. Scan the disk for 22 A8 00 E1 20 00 0A 2F. Change 22 to 38, A8 to 60, and E1 to 00. Mine was at Block $0100. byte 1E1. Write it back to the disk.

Softkey for...

Stickybear Opposites GS
Optimum Resources

Requirements:
Sector copier
block editor

Sector copy the original disk, recopying any tracks with errors. Scan the disk for 22 A8 00 E1 20 00 57 3A. Change 22 to 38, A8 to 60, and E1 to 00. Mine was at Block $0106, byte 16E. Write it back to the disk.

⑦ I'm looking for an APT for Silpheed. I've only been to the end of level 10 and there's 10 more after that. Any suggestions?

Comments: Copy II Plus 9.0

This update to my workhorse program has some new and interesting features. One of my favorites is the ability to compare files between identical (or deprotected disks) to see if there are any differences. Also in the update is the ability to launch another program, run it, and return to Copy II Plus. I don't know if it works with DOS 3.3 disks (probably not), but the program MUST be able to quit to ProDOS (Binary files don't work - at least none of mine have). Selection can now be with a mouse, or a press of a designated key, or for you die-hards, the arrow keys still work. Parameter lists for 5.25" disks are split into 2 separate files which require some juggling of filenames in order to read all of them (a program selector can solve that real quick, i.e. Bird's Better Bye). Few new parameters have been added for 3.5" disks. If you don't have this program, get it. If you do, call for the upgrade. It's well worth the money. You do need 128K minimum and 80-column ability (also a mouse if you want mouse control) for the program to run. A round of applause for the gang at Central Point. Note: It will not work with a Uni-Disk drive. Central Point maintains a bulletin board for parameters. New files and requests are accepted and current parameters (new) can be downloaded. Call (503) 690-6650.

Dr Crack   France

Softkey for...

Think Quick v1.2
The Learning Company

When I got my first issue of Computist (#67, thanks to your ad in Nibble), I read it and saw that some people cracked some games for the first time so I said to myself why not me?

So I tried to crack Think Quick, I first did a sector copy: it didn't boot. I then tried a bitcopy with Copy II+ 8.4: it didn't work either. I then nibble edited the original and I noticed that some bytes were always the same, they where just before D5 AA 96 so I guess they weren't copied by the copy program. I then searched through the disk, knowing that no prologs, epilogs or checksums had been changed, for 8C C0. I found them in a lot of places but two only were interesting: track $03 sector $00 and track $0B sector $05. I noticed that the program was searching on the disk, in those two places, for some of the bytes I had seen previously. I guess that's what you call a signature check. So I put an RTS at the beginning of the routines and booted. It would boot fine until the title screen then it would clear the screen, write "OOPS! Problem ..." and continue the boot process until it did it again and the menu would by displayed. I thought that those little annoying problems could be bypassed. So I searched for the message, found it and disassembled near it and there it was: the code would put zero in location $2000-$5FFF(Hires 1 and 2) and jump to a subroutine, so I just put NOPs in the clear screen routine and the JSR, making an educated guess that that routine was the one that would print the message. A few lines later the program would wait for a keypress a do an indirect jump through $FFFC, to reboot, so I just

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put an RTS after the JSR I had noped. I then continued the search for the message. I found a similar routine and did about the same thing as in the other one. I booted the game and... It worked.

The castle creator is on the other side of the disk so since this side boots too I said to myself maybe the protection scheme is there so I went on the same tracks & sectors and I found the same code so I just did the same sector edits as before and it worked!

This disk is ProDOS based and is RDOS (funny I thought RDOS was more or less DOS 3.3 and from S.S.I!)

Trk	Sct	Byte	From	To
2	F	DB-F3	????	EA
3	0	1C	20 ??	EA EA EA
		2D	??	60
		96	??	60
B	5	04	A9 56 85 08	BD 88 C0 60
B	6	4F-64	????	EA
		6A	20 ?? ??	EA EA EA
		A1	??	60

Playing Tip for...

ULTIMA V
Origin Systems

Passwords
Oppression: IMPERA
Resistance: DAWN

Keeps
Stonegate: Shadowlords' fortress, south of Lost Hope Bay.

Ararot: It's a keep in the underworld where a captain lives. He will tell you how the Shadowlords were created.

Bordermarch: In the mountain on the island north of Jelhom. They're allies

Stone keep: East of Jelhom.

Empath Abbey: Keep of Love. That is where the eternal flame of Love is

The Lyceaum: Keep of Truth. Eternal flame of Truth

Serpent's Hold: Keep of Courage. Eternal flame of Courage

Name of Shadowlords
Falsehood: FAULINEI
Cowardice: NOSFENTOR
Hatred: ASTAROTH

Mantras
Shrine of	Mantra	Town
Compassion	MU	Britain
Justice	BEH	Yew
Spirituality	OM	Skara Brae
Honor	SUMM	Trinsic
Sacrifice	CAH	Minoc
Valor	RA	Jelhom
Humility	LUM	New Magincia
Honesty	AHM	Moonglow

Entries to the underworld
•Fall in one of the whirlpools and you will be in a cave near Destard, I think.
•Go down one dungeon.
•Go down the falls east of Spiritwoods.

Crown Jewels
Crown: It's at the top of Blackthorn's castle
Amulet: Retrace the itinerary made by British's expedition
Scepter: It's in the Shadowlords' keep

Potions
Yellow: heal
Green: Poison. DO NOT DRINK IT
red: poison cure
black: invisibility
blue: sleep. DO NOT DRINK IT
white: X-rays
purple: I think it changes you into a giant rat

Words of power
Deceit: FALLAX
Despise: NILIS
Destard: INOPAI
Wrong: MALUM
Shame: INFAMA
Hythloth: IGNAVUS
Doom: VERAMOCOR
Covetus: I never found it. To get the shard I went down by Wrong.

Note on Doom: This dungeon is in the underworld, in the ethereal plane, you will need the amulet to find it, it's in the middle of the black plane. If you find a room with a mirror you've finished the game because if you go near the mirror you will be absorbed and ... Well, you'll see.

Magic
While playing the game I discovered 3 other spells.

AN YLEM (Garlic and Blood Moss), 1st circle: Makes things disappear

IN XEN MANI (Ginseng, Garlic, Mandrake): 2nd circle: Gives you food

REL XEN BET (Sulfur Ash, Nightshade, Mandrake): 6th circle: Changes foes into giant rats

Shards
Cowardice: At the bottom of Hytholth, on the isle of the avatar.

Falsehood: To find it go down the dungeon Deceit then go southwest through mountains then southwest in grass. At a major intersection go Northwest then Northeast then west then southwest on rocky hills then Northwest. Go then over a lake and there upon an isle is the shard of Cowardice.

Hatred: Go down Covetus

Miscellaneous
To play the harpsichord, sit on the chair in front of it and push the numbered keys on your keyboard.

An armorer makes "Skull keys" that make it possible to open magically locked doors. He will hide 3 each day, at noon, in the tree in the North-West corner of the town where he lives (I think it's Minoc).

You can find the glass sword in the east end of serpent's spine, BE CAREFUL FOR YOU CAN ONLY USE IT ONCE.

If you put a coin in the well of Paws and wish for a FERRARI you will get a horse for free.

If you search during daylight at the place where a moongate is at night you will find stone. It's called a moonstone, if you put it somewhere a moongate will appear there at night.

Smith the talking horse is in the bushes near Iolo's hut (to find him first enter the hut picture).

There's a magic carpet at the entrance to Lord British's room. You can board it and go over water.

The mystic arms and at the bottom of Hyth-loth.

"Legend tells of a spot in the Bloody Plains forever damp from the blood of many battles. Mandrake can be found there or in the fens-of-the-dead. Deadly nightshade can only be found in the most thickly forested spot of Spiritwood. Both may only be collected in the darkness of mid-night."

Bitkey for...

Where in the USA is Carmen Sandiego
Broderbund

I did not developed this bitcopy; it comes from Central Point Software and is to be used with Copy II+. I'm sending it because in issue #67 someone presented a bitcopy for this game using quarter-tracks, but this one doesn't.

Front
T0, B3=01, 45=01, 46=5F
T1-T22, 0E=9A, 0F=D5, 10=9D, 0A=03, B4=D4, BD=01, 45=00, 46=03

Back
T0-T22, B3=01, 0E=9A, 0F=D5, 10=9D, 0A=03, B4=D4, BD=01, 45=00, 46=03

Explanation
T0: copy track 0
B3=01: I don't know
45=01 and 46=5F: cut.high and cut.low: number of bytes to cut from track start
T1-T22: copy tracks 1 through $22
0E, 0F and 10 : address prologs
0A=03: number of bytes to match with ad-dress start table when finding track start by header
B4 and BD : I don't know
45=00: cut.high

Jim Ross _____ NH

Bitkey for...

Dungeon Master
FTL

Requirements:
Apple IIgs
Copy II+ V9.0

This disk only has one error in it on block 17. CopyII+ sector editor would read the block when patched to ignore data checksum. This also re-vealed that the 12 Macintosh Tag Bytes (nor-mally all zeros for IIGS) had values. Block DC on the disk does a GS/OS Dread on block 17 and looks for a 27 error code in the accumulator or it gives a Dungeon Master error. This can be by-passed by changing byte 83 from 00 to 27 (LDA 00 00 to LDA 00 27) but the resulting disk crashed with fatal errors.

It turns out that block 17 contains valid data that the program reads like a Macintosh block by using smartport calls. These calls are 20 0D C5 (JSR C50D). A call is first made to reset the read hook and substitute the programs own read rou-tine, then a smartport call to read Block 17 is made and the resulting data loaded into memory at 16/BFAA. This is done in repeating loops by the code in Block 106 which loads in memory at 01/1F6B. This code is called twice by memory locations 04/D380 and 01/1063 during the load program process. This whole process is very complex and many reads from the 16/BFAA area are made into the program. To fix all these reads and make a true softkey is beyond my ability.

Copy II+ V9.0 will make a working backup of the program by sector copying the disk then bit copying track O answering no to both sync and nibble count. Be sure to verify the disk after copying to make sure the only error is on Block 17. This copy will run but will ask you to insert the original disk when you try to save a game.

Block 104 contains the code which checks for an original disk when you try to save. This code loads in memory from 01/1B85 to 01/1C94. After looking at this code it became apparent it also uses smartport calls to read Block 17 in a special way. Looking at Block 17 using copy II+ nibble editor, a large number of bytes in the data were in inverse, indicating bytes with more than 8 bits. This code first reads Block 17 and verifies that the Tag bytes are not zero, then it reads Block 17 twice using different read routines and it expects to find some bytes different. If the two reads are identical (as our copy will be), it fails by setting the carry and the program asks for the original disk. The pertinent code is in memory from 01/1C4F to 01/1C94. The code is as fol-lows:

```
1C4F:20 95 1C    JSR   1C95
1C52:E2 20       SEP   #$20
1C54:A9 02       LDA   #$02
1C56:8D 02 1D    STA   1D02
1C59:C2 20       REP   #$20
1C5B:18          CLC
1C5C:7B          TDC
1C5D:69 0B 00    ADC   #$000B
1C60:20 95 1C    JSR   1C95
1C63:A7 21       LDA   [21]
1C65:F0 2A       BEQ   1C91 (+2A)
1C67:A7 27       LDA   [27]
1C69:F0 26       BEQ   1C91 (+26)
1C6B:A0 B0 02    LDY   #$02B0
1C6E:A2 00 00    LDX   #$0000
1C71:B7 21       LDA   [21],Y
1C73:57 27       EOR   [27],Y
1C75:85 25       STA   25
1C77:29 E4 E4    AND   #$E4E4
1C7A:D0 15       BNE   1C91 (+15)
1C7C:A5 25       LDA   25
1C7E:29 1B 1B    AND   #$1B1B
1C81:F0 01       BEQ   1C84 (+01)
1C83:E8          INX
1C84:88          DEY
1C85:88          DEY
1C86:10 E9       BPL   1C71 (-17)
1C88:E0 00 00    CPX   #$0000
1C8B:F0 04       BEQ   1C91 (+04)
1C8D:18          CLC
1C8E:AB          PLB
1C8F:2B          PLD
1C90:6B          RTL
1C91:38          SEC
1C92:AB          PLB
1C93:2B          PLD
1C94:6B          RTL
```

I tried changing the set carry at 01/1C91 from 38 to 18 (clear carry) and the program bombed. I found that changing any byte in this code caused the program to bomb. There must be a checksum somewhere for this code. Rather than find it, I swapped the 38 (set carry) at 01/1C91 with the 18 (clear carry) at 01/1C8D and the program ran. This is done on disk by changing Block 104 Byte 111 from 18 to 38 and Byte 114 from 38 to 18.

Step by Step
1. Manual sector copy the disk
2. Manual bit copy Track 0 with sides :02 sync:N Keep:N (note I used copy II+ V9.0, my V8.4 would not work)
3. Verify the copy to insure only one error on the disk (block 17). Bit copy Track 0 until you get only one error.
4. Sector edit block 104

Blk	Byte	From	To
104	111	18	38
104	114	38	18

Note: Copy II+ V9.0 has parameters for Dungeon Master that bit copies Tracks 0, 21 and 22. There is no reason to bit copy Tracks 21 and 22. This will make a working back up. My Block 104 sector edits allow you to save games.

Randy Flood _____ OR

Softkey for...

Bad Dudes
Platoon
Data East

1. Copy the disk with a standard disk copy program. (I used Copy II+.)
2. Sector Edit the copy.

Trk	Sct	Byte	From	To
05	0E	48-4C	66 EA 9D AB FF	EA EA EA EA EA

I figured this out by examining the parameter file for Platoon on Copy II+v9.0. I can't figure out what needs to be changed in order to gain unlimited lives though.

⑦I ask that someone who is adept at remov-ing copy protection, or programming in assem-bly language write to me. I am interested in buying a modem, and an NMI card, so anyone who could suggest good brands should also write to me at:

1730 Ash Street
North Bend, OR 97459

SkyPhantom _____ CT

After reading Computist #68, I felt I should write to Computist to respond to a few fellow Computists and to deliver some more softkeys. First of all, I would like to thank Dan Halfwit for his "King of Chicago" softkey. I had been work-ing on kracking that program for quite some time with little success.

To Dr. Hackenbush: In Wizardry V, the Laughing Kettle is, indeed, in the northeast cor-ner of the first level. Have you made a map of the level yet? If not, it will be quite difficult to explain where it is exactly (it is in the middle of nowhere). I will try anyway. Let's start in the room where the Orb of Llylgamyn was found. Follow these directions: Exit the room, then travel 1E 1N 1E 1N 1E 2N 1E 2N 2W 3S 1W 5N 2E 2N 3W 2N 1E. Here, (I)nspect for a secret door. You should find one. Go through the door and travel straight. You should find the kettle there! By the way, the kettle is not really essential to the game. He just offers various advice (for a fee, of course).

Adventure Maps
I thought this would be a good time to bring something up. Being an avid adventurer, I have mapped many games, including the dungeons of

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the Bard's Tale series and Wizardry V. After mapping them on graph paper, I used SuperPaint on my MAC SE to produce top-quality maps. Anyone interested in maps for Bard's Tale III or Wizardry V (up to level 3) just send me a self-addressed stamped envelope and the game and level you desire. On these maps I have also recorded any special words or items that come up on the particular level. I have also come up with the sector-editing scheme for "enhancing" your characters' abilities in Wizardry V. Addition-ally, I have been able to determine the password that is required to enter the maze simply by jumping into the monitor at the prompt and displaying memory locations $6E00-6E50 via a "6E00.6E50". The first four capital letters in a row should be the password. Hopefully, I will soon come up with a softkey to eliminate the entire routine.

How about sending us copies of your maps on a MAC disk so we can print them? Unless you think that may be too much of a giveaway. ....RDEXed

Softkey for...

Pool of Radiance (IIe)
Strategic Simulations

Requirements:
64K Apple IIe/IIc/IIgs
5 1/4" disk copier (I used Copy II Plus)
5 1/4" sector editor (I used Copy II Plus)
8 blank disk sides

Pool of Radiance is a fairly new game created by a joint effort of SSI and TSI, the people of Dungeons and Dragons fame. The game itself is good, but the boot up process is a pain. The user must insert various disks as the boot progresses. After all this, he must use an indecipherable code wheel to determine a password. In Computist #68, Ashish Morzaria (to whom I must give some credit) gave a method to "trick" the password protection by substituting a personalized pass-word for each of the normal ones. I decided to eliminate the entire routine outright. I found the area in memory where the passwords were lo-cated and traced the code backwards. Eventually, I found the following code in memory and searched for it on the disk. I found this on side 1, starting with track $11, sector $05:

```
0F0:20 FA 7D    JSR   7DFA
0F3:A9 03       LDA   #$03
0F5:8D 12 67    STA   6712
0F8:A9 02       LDA   #$02
0FA:8D FC 40    STA   40FC   set up password routine
0FD:20 1B 96    JSR   961B   the password routine
100:A9 82       LDA   #$82   continue loading
```

I simply eliminated the jump to the password routine by replacing the $20 1B 96 at $FD with $EA EA EA.

1. Copy the disks with any 5 1/4" disk copier, ignoring any errors.
2. Make the following sector edits to side 1:

Trk	Sct	Byte	From	To
11	05	FD-FF	20 1B 96	EA EA EA

3. Be sure to write the edits back to the disk!

Softkey for...

Curse of the Azure Bonds (IIe)
Strategic Simulations

Requirements:
64K Apple IIe/IIc/IIgs
5 1/4" disk copier (I used Copy II Plus)
5 1/4" sector editor (I used Copy II Plus)
7 blank disk sides

Curse of the Azure Bonds is the second in-stallment of the Dungeons and Dragons series. The boot up process has been improved some-what over that of Pool of Radiance. No longer is the user required to insert various disk sides. There still remains, however, a password check. I checked memory for a routine that resembled that of Pool of Radiance. I found that the new routine was not in the same location. A few memory locations had been altered and the start-ing address had been changed, but most of the routine remained the same. I simply replaced the jump to the password routine with three more $EA's.

1. Copy the disks with any 5 1/4" disk copier, ignoring any errors.
2. Make the following sector edits to side 1:

Trk	Sct	Byte	From	To
13	0F	$01-03	20 BA 96	EA EA EA

3. Be sure to write the edits back to the disk!

IIgs Softkey for...

Bubble Ghost
Accolade

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

This is a neat little program where a ghost must "blow" a bubble across various levels of play. The only problem is that before you can play, a certain level is displayed on the screen and you must look up which level it is on a piece of black-on-red paper. This is a pain in the ____ (fill in the blank).

Rather than go blind from the absurd color combination of the cheat sheet, I set out to elimi-nate the routine. What I did was assume there was simply a jump to this check subroutine from the main program. I followed the main program,

inserting a break point (00) at every jump. Eventually, I found the jump for which I was looking.

The code on the disk contained zeros for the values to which the program jumps, but in memory the zeros were filled with legal values. Here is the code on the disk:

```
193:8D 00 00        STA  0000
196:22 00 00 00     JSL  000000
19A:22 00 00 00     JSL  000000
19E:AD 00 00        LDA  0000
1A1:48              PHA
1A2:22 00 00 00     JSL  000000
1A6:7A              PLY
1A7:9C 00 00        STZ  0000
1AA:7B              TDC
1AB:18              CLC
```

In the above code, the JSL at $1A2 is the "Jump to Subroutine Long" that must be nullified. To do so, just simply replace the $22 with an $AF. This causes the program to do a harmless accumulator load. In a nutshell:

1. Copy the disk with any 3 1/2" disk copier, ignoring any errors.

2. Make the following sector edits to the disk:

Blk	Byte	From	To
$17C	$1A2	22 00 00 00	AF 00 00 00

3. Be sure to write the edits back to the disk!

IIgs Softkey for...
Battle Chess
Interplay

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

Battle Chess is a new game released by Interplay (a subsidiary of Electronic Arts). Battle Chess adds an entirely new dimension to the game of chess. When one piece captures another, they go through a "fight" and the winner survives. The graphics are good, and the sound effects are nice. The only major problem with the game is that before the start of the game, the user must find a certain famous chess match in the manual and find a specific move that either white or black made. This move must be entered correctly for the game to continue.

To remove this protection scheme, I followed the main program, inserting break points at every Jump to SubRoutine. I eventually found the code I was looking for on block $3D8:

```
0F9:20 90 35        JSR  3590
0FC:20 E0 32        JSR  32E0
0FF:20 DE AA        JSR  AADE
102:60              RTS
```

The Jump to Subroutine at $FF turned out to be the culprit. I simply replaced the JSR with a harmless LDA and the game loaded and ran without having to look in the manual for the correct move. In a nutshell:

1. Copy the disk with any 3 1/2" disk copier, ignoring any errors.

2. Make the following sector edits to the disk:

Blk	Byte	From	To
$3D8	$FF-101	20 DE AA	AD DE AA

3. Be sure to write the edits back to the disk!

IIgs Softkey for...
The Duel: Test Drive II
Accolade

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

1. Copy the disk with any 3 1/2" disk copier, ignoring any errors.

2. Make the following sector edits to the copy:

Blk	Byte	From	To
$169	$19B-19E	22 E3 C4 03	AF E3 C4 03
	$1F3-1F6	22 E3 C4 03	AF E3 C4 03
$191	$1D8-1DB	22 E3 C4 03	AF E3 C4 03
$199	$125-126	F0 16	80 16

3. Be sure to write the edits back to the disk!

On a final note, I would like to direct a comment to Charles Haight, the person who seems to be trying his hardest to keep Computist going. Feel free to send me some flyers. I feel I can pass some out and get some feedback. Also, I am fairly well-known on America Online (the new name for AppleLink now that Apple had abandoned it) and I can talk to the people who own the system and see what they think about Computist moving in. I believe we can open a "room" a couple of times a week, and Computists (or anyone else) can drop in and chat. Let me know what you think (readers?).

Bob Igo _____ PA

More APT's:

Advanced Playing Technique for...
Captain Power
?

Ships

Trk	Sct	Byte	From	To
$0D	$07	$99	05	any
$0E	$0D	$44	05	any

Bombs

Trk	Sct	Byte	From	To
$0D	$06	$32	04	any
$0D	$07	$29	04	any

Eliminate Power countdown

Trk	Sct	Byte	From	To
$0D	$00	$34-36	8D E0 82	EA EA EA

Instant destruction of enemy ships

Trk	Sct	Byte	From	To
$0D	$09	$44	F0	D0

Unlimited power/instant refueling

Trk	Sct	Byte	From	To
$0D	$06	$28-29	D0 2D	EA EA

Bomb power (for 1 hit to destroy)

Trk	Sct	Byte	From	To
$0D	$02	$BA	05	9A

Advanced Playing Technique for...
Mapple:
?

Advanced Playing Technique for...
Unlimited lives

Trk	Sct	Byte	From	To
$0C	$03	$79-7B	CE E9 4C	EA EA EA

Advanced Playing Technique for...
Situation Critical:
?

Starting level

Trk	Sct	Byte	From	To
$17	$0C	$18	00	level

Number of levels advanced

Trk	Sct	Byte	From	To
$17		$A2	01	??

Try changing the starting level to 10 and see that you were never meant to get that far on phase II. I don't know how high the other phases go. Also, the game will end after you go through phase II if you start on any level other than 0. The above edit changes the number being stored in location $6C. However, $7BAD also holds the current level. I have tried changing both of them, but the storage to $6C seems to be the only thing which changes your starting level, and nothing I did stopped the GAME OVER message at the end of phase II. Perhaps I'll try searching for any reference which affects the number stored in $6C or $7BAD. If this works, it should be in the next issue of Computist. Try it yourself and see what happens: Using a sector editor, such as Copy II+, search for $6C. Any time that number is found, disassemble, or (L)ist, the code before it to see if any modification to the number stored there is being made. If no modification is being made, keep trying the whole disk. I'd try references to $7BAD next, searching for the numbers, AD 7B. I'd be really suspicious if modifications were made to one of the two locations with a check to the other one, such as:

```
INC  $6C
CMP  $7BAD
BNE  ????
```

Of course, there are a number of possibilities at this point. I won't know exactly how it's being done until I look closer. As I said before, try this yourself, and if I can't do it, please explain to me how you did.

To anyone who can/wants to edit games, write to me, and we'll talk APT's. I have an editor disk which contains over 70 specific game-editing programs for both old and new games. The ones which I have personally created over the years are: Saracen, Buck Rogers, I/O Silver, Conan (changes speed), Gemstone Warrior, Mine Sweep, Arkanoid, Xevious, Trolls and Tribulations, Microwave, Oil's Well, Pharoah's Revenge, Chrono Warrior, Anti Gravity, Demonic Decks, Pool of Radiance, Times of Lore, Captain Power, Mapple, Situation Critical, and, of course, the one that got lost in the shuffle of other people's submissions, Bard's Tale III. It's constantly being updated and improved, so if you send me a blank disk, I'll fill it full of editing programs at no cost. However, in return, I'd appreciate the exchange of any game editing theory and techniques, because I am constantly learning new things, but there is still much more that is to be learned from others. Maybe there is another person out there who knows much more than I do about editing games. I am hoping he/she will be gracious enough to teach me all he/she knows about the subject.

⑦ Does anyone have a block read/write (stand-alone) program for ProDOS? If so, I'd appreciate the name and publisher of it because I'd like to be able to make //gs editors for 3.5" disks.

Jason Schaad _____ Canada

To Henry Kornhauser: (Computist #70, page 18) I have the reason for your Laser drives not working. First of all the Laser drives are not compatible with the Apple IIgs operating system, GS/OS. The reason for this is because there are no drivers for the Laser drives when you are booting the program. I phoned a Tech Support line in the States and they said and I quote, "The Laser drives are dumb, they don't recognize GS/OS and some of ProDOS 16".

Notes on War in Middle Earth

I see that the game War in Middle Earth is on the most wanted list. I have an original and you can copy it with just about any copy program (I used Diversi Key) but Copy II+ 8.4 disk copy also works too. I don't think the game is even protected, and if it is it sure doesn't have a very good protection scheme. So if you're like me and hate to play on your originals you can now play on a fully functional back-up of War in Middle Earth.

Notes on LaserForce

Another game I found easy to copy is, LaserForce by Britannica FanFare. All you have to do for this one is use Copy II+ 8.4 and use the bit copy, copy the whole disk, and you now have a fully functional back-up.

I know that this is not how most of the games are copied but it 'works'.

⑦ What issue did Apple IIgs Softkey's first appear in.

⑦ I have tried to find some good books about programming in 65C816 but have been unsuccessful. I was wondering if anyone could tell me of any good book and where to get it from.

⑦ Also could someone explain to me how you can make your own Super Hi-Res graphics, and how to use the Ensoniq speaker and the 15 voices that the Apple IIgs has.

Dave Pritchard _____ AZ

⑦ I've heard about Track Star, & Wildcards. I would like some more information on these. Can someone give me a simple explanation?

⑦ I have tried the fix for Superprint! as described in #70, page #13. My version came on 5.25" disk. The program will copy as described, using Copy II+. However when I try to access the program with a block editor as described. I get a system lockup. Heeeellllllppp. I would like to be able to put this all on a 3.5" instead of the stack of 5.25"s required.

James E. Bulman _____ GA

Some notes on RISK (Leisure Games)

RISK by Liesure Games is an excellent re-creation of the famous board game. I was very pleased to receive it as a Christmas gift and quickly proceeded to my issues of COMPUTIST to find a softkey. I was disheartened to find it on the "Most Wanted" list. After several feeble attempts I thought I had cracked it. Unfortunately the crack is more elusive than I had hoped. So here is the Partial Softkey, maybe it will help someone else crack it!

1. Boot your DOS 3.3 System Disk
POKE 47426,24
RUN COPYA

2. Boot Copy II+ (Version 8.3)

3. Select Copy Files

4. Copy the ProDOS file from Copy II+ on to the COPY of RISK.

The game will run if, after copying, you immediately boot the disk with open-apple ctrl reset. If a "cold boot" is performed, the game begins to boot, a title screen appears, and the error message "Check Disk Drive" appears. After that, the game will not boot by any means.

Some notes on Copy II Plus v9

I also have a helpful tip for anyone who has purchased Copy II+ Version 9. This updated version contains information on both sides of the disk. Utilities on side one; Parms on side two. In an addendum, Central Point Software recommends copying sides one and two onto separate disks. Sounds like a good idea, but don't get too excited yet. Each time you need to access the Parms you must remove Disk 1 from Drive 1 and insert Disk 2. It will not access the Parms if they are in Drive 2! This isn't the worst of it. It seems that there are two sets of Parms on side two. You have to go through a ten-step routine to rename ALL the files on side 2 EVERYTIME you want to gain access to the second set of Parms. You must then go through this ten-step routine BACKWARDS to gain access to the first set of Parms again. It doesn't take a nuclear scientist to realize that this is a royal pain.

Well, I quickly figured out a better method.

1. Copy Side 1 of COPY II+ onto one disk. Set this copy aside.

2. Copy Side 2 of COPY II+ onto Side 1 of a second disk.

3. Copy Side 2 of COPY II+ onto Side 2 of the second disk. Set your original COPY II+ aside.

4. Delete the files PARM.DATA2 and PARM.KEY2 from Side 1 of the second disk.

5. Delete the files PARM.DATA and PARM.KEY from Side 2 of the second disk.

6. Rename PARM.DATA2 to PARM.DATA and PARM.KEY2 to PARM.KEY on Side 2 of the second disk.

Now if the Parms you need are not on Side 1 of the second disk, all you need to do is flip the disk and try again. Unfortunately you still can only use Drive 1. I suspect we'll have to wait for Version 10 for that fix.

Groucho Tarz _____ PA

Softkey for...
Impossible Mission II
Epyx

I would like to begin this softkey by thanking all of those who contribute to Computist. This particular softkey owes a tremendous debt of gratitude to Jim S. Hart, whose work on other Epyx games led to this softkey for Impossible Mission II.

Impossible Mission II uses Epyx's standard protection scheme, a signature check. This signature is decoded by the software and is used as actual program code to load the rest of the game. What this softkey does is place the bytes that the

---

protection scheme expects to find in the memory locations where they are expected to be found. The end result is that the disk thinks it has found the electronic signature, when in fact it hasn't even gone to the disk to get it.

As far as I know, this softkey works perfectly. I am still trying to solve the game, but as yet have not managed to do it. This, I think, is due to a lack of time to practice playing rather than any error in the softkey.

1. Use COPY II Plus, Disk Muncher, or some other copy program that can ignore errors (Or use COPYA after telling DOS to ignore checksum and epilog errors: POKE 47426,24 : RUN COPYA) to make a copy of Impossible Mission II.

2. Sector edit the copy.

Trk	Sct	Byte		To	
00	05	0E-30	A6 2B BD 89	A9 FC 85 F0
			C0 BD 8E C0	A9 EE 85 F1
			A9 80 85 FD	A9 FC 85 F2
			C6 FD F0 7A	A9 FC 85 F3
			20 A5 BB B0	A9 E7 85 F4
			75 A5 F9 C9	A9 EE 85 F5
			0A D0 F1 A0	A9 FC 85 F6
			00 BD 8C C0	A9 E7 85 F7
			10 FB 88	4C 7A BB

Again, thanks to Jim S. Hart for his articles in Computist #57, #61, and #66. The "to" code above was written by Mr. Hart, and I was pleased to see it required only one byte of modification by me.

⑦ How about adding a new name to the list of wanted softkeys. I just purchased Tangled Tales, and have had no luck with it using previous softkeys by the same manufacturer. Even backup copies made with Essential Data Duplicator 4 Plus, version 4.8, do not work! One tough disk! Anyone else have a softkey.

Senior PROM — NOT Available

I am sorry to inform new readers, but I recently tried to purchase the Senior PROM from Cutting Edge Enterprises, as listed in the front of each Computist issue. They wrote back to inform me that they no longer sell the product, but continue to support it to registered owners. This means that it is getting harder for us non-GS owners to visit the Monitor at will.

⑦ This is an urgent request to anyone out there who have made any modifications to the Apple IIe (enhanced) ROMS. Please send me any information on the modifications you made, what they are for, why, etc. I plan to replace one of my ROMs with a modified ROM, using the new EPROM burner I bought, to enable me to reset into the monitor. So far I have only the vaguest notion what I want to do. While I'm at it, I'd like to fix any known bugs, etc., so your letters would be a huge help! Also, if anyone knows if there is a "patch area" in the apple ROMS which could be used to store all or part of DOS 3.3, please describe how I could do this. Ideally, I would like to be able to reset into the monitor, as described above, then be able (for example) to issue a CALL xxxx command to have DOS "magically appear", so that I could write a captured RWTS to disk without booting a disk! Any info anyone has would be appreciated, and I will write an article on exactly what and how I did it once it works!

Cheap NMI?

I managed to build a cheap NMI. Maybe you'll find it useful. I've found that it works in most cases, though some programs can defeat it.

Go to your local electronics supply house, such as Radio Shack. Buy a push-button (normally open) momentary switch (this means that the switch only makes contact when the button is pressed). Also buy "Telephone spade lugs (Radio Shack catalog number 64-3070) and a 100 Ohm Resistor (5% Tol., 1/2 watt works fine, Radio Shack catalog number 271-012). Solder the parts in this order:

Lug-Wire-Switch-Wire-Resistor-Wire-Lug

Now, run the switch out the back of your Apple. Plug one of the lugs into pin 26 (the upper left pin as you face the keyboard) and the other into pin 29 (just a couple of pins down from pin 26, also on the left) of ANY unused slot. If you've done this right, booting a reset-protected program should work as normally (i.e., it should boot and reset should still not work). However, pressing your new "cheap NMI" button will probably stop the program. I have found that it stops older Strategic Simulations RDOS disks, but does not stop Ultima V. In any event, for a total cost of under $3.75 (estimated), it's not a bad little device. Of course, I assume no responsibility for fried motherboards, blown peripheral cards, etc.! Use the information at your own risk!

I would like to make this urgent plea to all Computist readers. SUPPORT COMPUTIST NOW!!! I have purchased many back issues in the last couple of months, written to all the Apple owners I can find, and joined the club Computist has formed. I strongly urge you to support them in every way, especially financially. It only costs a few cents to write to someone else and tell them about Computist and how it can help them. Back issues only cost a few dollars, and every one you order means that many dollars longer we will still be able to receive new issues of Computist. I propose that all readers buy at least one back issue for each softkey they have ever used from Computist. If you have all the back issues, fine. Just get one new subscriber for each softkey you've ever used. If we even get close to meeting this goal, Computist will be with us forever. And I don't know about the rest of you, but I don't know what I'd do without it!

Les B Minaker   Canada

IBM Playing Tip for...
MechWarrior
Activision

These steps are needed to meet the game's objective. This solution does not, however, help you in the final battle. That solution is left up to the player — fighting and defeating The Dark Wing. This may or may not be the only solution to the game. It certainly worked every time I tested it.

Read reminder of mission after opening sequence.

Go into bar and order a drink.

Barkeep says he doesn't know of any winged skull emblems.

Order another drink.

Barkeep suggests contacting Grig Griez about winged skull emblem.

Enter 'Mech Complex

Old timer talks about Helmar Valasek.

Travel to any Kurita planet.

Read news in Blazing Ace's.

Report offers reward for Grig Griez - further details on Galedon V.

Travel to Galedon V.

Enter government buildings - officer says Griez found near Land's End.

Travel to Land's End.

Go into bar and order a drink.

Barkeep says to come back tomorrow.

Enter 'Mech Complex and sell your Jenner - why pay to carry it?

Go into bar and order another drink - agent gives a location for Griez.

Travel to Kurita planet that Griez's agent named.

Accept Griez's mission - take package to Stiener planet of Dustball.

Travel to Dustball.

When agent attacks fight once then run.

Agent talks of a dropship named Stone Arrow.

Go into bar and order a drink.

Barkeep says to come back tomorrow - he'll know more about dropship then.

Waste some time by going to Blazing Ace's and reading the news.

Go into bar and order a drink.

Barkeep talks about the jumpship's captain - he has a brother, Wendall.

Barkeep names a Marik planet where Wendall is on garrison duty.

Travel to the Marik planet named by barkeep.

Enter 'Mech Complex.

Wendall will name a Davion planet where brother has a woman friend.

After leaving 'Mech Complex you will be attacked - don't fight, run.

Travel to the Davion planet that Wendall named.

Go into bar and order a drink - meet Kearney; he blames Black Widows.

Leave bar and follow address Kearney gave. When you see assassin fight him.

Read news in Blazing Ace's; - Jordan Rowe gives Black Widow Planet.

Travel to planet named by Jordan Rowe.

Go into the bar; challenge Natasha Kerensky's story and meet Tasha.

Read news in Blazing Ace's; Jordan Rowe says meet Kearney on Albiero.

Travel to Albiero.

Follow woman that you see.

Trust Tasha - Kearney is not who he says he is.

Read next messages carefully - location of Dark Wing and Chalice is given.

Advanced Tips

Excess baggage

Sell your Jenner at the beginning of the game. It costs plenty to cart it around with you. When you finally obtain the location of the Dark Wing, you'll receive about 5,000,000 C-bills. This is more than enough to buy a much better 'Mech, like a Rifleman or a Marauder.

Was that three or four characters?

I wrote to Activision when I was unable to recruit a fourth member for my 'Mech lance. According to Activision the game requires 640K of memory but, if there are any TSR programs using memory only three characters are allowed. Things to watch for are mouse drivers or disk caches. Nowhere is this mentioned in the documentation - consider yourself warned! To circumvent this problem, create a boot diskette that simply loads DOS. If you really want to be fancy, include a small batch file to load MechWarrior for you.

To earn additional C-bills

If you travel to planet where you found Griez an old man will ask you to kill Griez; you should accept his offer. When you first see Griez wait. You will then be given another chance to kill him - attack then. You will receive a 200,000 C-bills reward for killing Griez.

The famous travelling salesman maneuver

Travel to the central planet in any sphere. Buy as many 'Mechs as you can afford. Then travel to a planet on the outer rim (away from coreward) and sell all the 'Mechs you have. You should realize a 10% to 15% profit from this activity, including transportation costs. If the planet you travel to does not want to buy 'Mechs simply travel to the next closest and try to sell the 'Mechs again. Repeat as necessary.

They're not all the same

Not all the Houses offer would-be mercenaries the same compensation when negotiating contracts. The Federated Suns are fairly free with C-bills and quite generous with salvage. The Lyran Commonwealth is very generous with cash but they will give little salvage to mercenaries. The Draconis Combine drives a hard bargain; don't expect to get rich from them. The Free Worlds League offers average C-bills and salvage. The Capellan Confederation isn't a good place for mercenaries to hire on - they are reported to sometimes not pay! When bargaining for missions, try to get as much salvage and as many C-bills as possible. Set your target payment high - only the Kurita get really upset when you ask for 2,000,000 C-bills to defend a factory against a couple of Shadow Hawks. The prepayment percentage is not important unless you have 'Mechs that need to be repaired right away.

MechWarrior Authorization Codes:

The below listed codes are needed to defeat the copy protection. The program will show a picture of a 'Mech and ask for a response to a coded phrase. All of the phrases are unique and there is no need to know the actual name of the 'Mech shown. I have summarized them here because I don't like flipping through manuals just to defeat copy protection!

LCT-1V Locust

Whiskey Delta Tango	Night Stalker
Xray Zulu Charlie	Future Guard
Foxtrot Echo Delta	Red Dawn

JR7-D Jenner

Foxtrot Oscar Xray	Duck Soup
Sierra Echo Xray	Dragon Tail
Juliet Alpha Sierra	Yellow Bird

PXH-1 Phoenix Hawk

Papa Foxtrot	Tin Man
Echo Golf Alpha	Black Witch
Victor Victor	Red Arrow

SHD-2H Shadow Hawk

Lima Golf	Slasher
Romeo Alpha Zulu	Glory Boy
Foxtrot Alpha Delta	Bad Dream

RFL-3N Rifleman

Charlie Charlie	Black Jack
Hotel Oscar Tango	Red Lance
Foxtrot Alpha Romeo	Sakhara

WHM-6R Warhammer

Tango India November	Grave Walker
Papa Bravo	Mad Dog
Whiskey Alpha Romeo	Silver Hawk

MAD-3R Marauder

Bravo Alpha Delta	Renegade
Mike Alpha Sierra	Small Room
Zulu Alpha Romeo	Black Baron

BLR-1G BattleMaster

Charlie Alpha Tango	Snow Fire
Hotel Oscar Tango	Screaming Eagle
Bravo Alpha Bravo	Grim Jim

Playing Tip for...
Mean Streets
Access

Mean Streets Code Words

The below listed codes are needed to defeat the copy protection. I have summarized them to save honest users the hassle of searching through the manual to locate a word. Of course, no dishonest users would make use of this information.

Pg	Paragraph	Word #	Word
05	Loading Instructions	3rd	going
05	Loading Instructions	7th	mean
06	Realsound	2nd	is
06	Realsound	1st	realsound
07	Playing the Game	2nd	the
07	Playing the Game	6th	before
08	The Story	3rd	layer
08	The Story	6th	fog
14	Overview	4th	an
14	Overview	2nd	streets
15	Where to Go	3rd	fly
15	Where to Go	7th	data
16	Getting Started	1st	here
16	Getting Started	6th	have
19	Searching a Room	2nd	of
19	Searching a Room	6th	visit
20	Write Down Clues	2nd	down
20	Write Down Clues	4th	that
21	Defend Yourself	3rd	find
21	Defend Yourself	7th	gun
22	The Inventory System	4th	all
22	The Inventory System	6th	you
23	Bounty Hunting	4th	extra
23	Bounty Hunting	6th	and
26	Playing Tips	1st	keep
26	Playing Tips	4th	log

Mean Streets Destination Codes:

The following codes can be entered into the navigational computer.

Delores Lightbody	4920
Peter Dull	4674
Sandra Larsen	4599
Warehouse	4675
Carl Linsky's house	4660

Arturo V. Magidin   Mexico

IBM Playing Tip for...
Pool of Radiance
SSI

This is a great game, although a complex one. Here is some help for the adventurer.

Characters: Although any party should be able to succeed in the game, a balanced party will help you a lot. In a party you should have good fighters, a couple of magic-users, at least two characters able to throw clerical spells, and a character with thieving abilities. As this is more than six characters, the allowed maximum, you'll need some multiple-class characters. These characters, although having the advantage of multiple-class, have two serious drawbacks:

1) Their experience points are divided between all classes equally. For example: if you have a Fighter/Magic-user, in order to achieve the second level as a Fighter (which requires 2001 experience points), you'll have to earn 4002 EP, since half of them go to the magic-user points.

2) Since they have to be demi-humans in order to be multiple-class characters, an upper limit (except for thieves) is given to their advancement.

Now, my personal favorites for a party are: a Human Fighter, a Human Cleric, a Human Magic-user, a Half-elven Magic-user/Cleric, a Dwarven Fighter/Thief, and an Elven Fighter/Magic-user. You could also experiment with a single class thief.

Sex and Alignment - If you are a AD&D veteran, you know alignment has to play a part in how you react to a given situation. This, however, does not hold for Pool of Radiance. Both a completely Lawful Good party and a Chaotic Evil one will encounter the same monsters, go on the same missions, and may complete them the same way. If you want to play a proper alignment game, you could easily loose. For example, a Chaotic Evil fighter might be tempted to join the forces bent on Phlan's destruction. But if he does when offered, you will simply loose that character. Even clerical turning is not affected. An evil cleric, instead of destroying or turning undead, should control them. This is not the case, however. So alignment should play no part on your actions. As for the sex of your character, I'm afraid male characters are the best choice. A female character gains no advantage, and her Strength score is limited. So male's the choice.

Magic - There are few things in the game as annoying as when you cast a spell only to be forced to abort it because the range was too limited. The game manuals don't include a range or a duration table for spells. Fortunately, this seem to be the same as for normal AD&D rules. See table #1 for range, and duration of spells:

All spells which have a radius of effect, except Stinking Cloud, will affect an area surrounding the targeted square. The Stinking Cloud will form itself on the squares to the right, down and down to the right of the targeted square.

Remember: A Lightning Bolt will rebound off walls to achieve it's length, but it will rebound towards the caster, and not at the natural angle.

Backstabbing - One of the most powerful thieving skills is backstabbing. If a thief, wearing armor no heavier than leather, and attacks an enemy from behind, he'll have a bonus in the to-hit roll and do four times the damage. To ensure the thief will backstab in the game is, however, difficult, because of the automatic facing the monsters have. Therefore, you should have your thief Delay until the monster has attacked, then attack him with another character, and then, approaching from directly opposite from the direction the previous attack was made, attack with the thief.

Monsters - Ever tried to cast a "Charm Monster" on a Skeleton, or a Sleep spell on a Troll, only to see it fail?

Remember: Undead (Skeletons, zombies, vampires, etc.) are proof against charm spells, sleep spells, hold spells, and stinking cloud. Trolls are immune to charm, hold and sleep spells. Wyverns are not affected by Charm Monster.

Trolls will raise from the dead if you wait too long after killing them. To prevent this, have a character standing in one of the squares where the troll was just before being killed.

A wild boar will stand up after being killed for the first time, unless the damaged drops him to below -10 HP.

Now, some help with the game proper.

Slums

1) There is a secret Treasure Room in the NW corner of the block.

2) The Goblin Armaster, and the orcs to the north of the Gypsy woman have magical treasure.

3) Search the room after killing the Hobgoblins in the north.

4) Search the Stable.

5) Don't fight or ask more money for Ohlo's potion. Just give it to him and he will give you a good reward.

6) You need to clear 15 random encounters before clearing the block, beside all fixed encounters. Fixed encounters happen always in the same place.

7) You can rest in any room where you've defeated a fixed encounter, and anywhere once you've cleared the block.

Table #1 - Magic Spells

Spell Name	Range	Duration
First Level		
Bless	6	6 rounds
Burning Hands	Touch	Instant
Cause Light Wounds	Touch	Instant
Charm Person	12	Combat
Cure Light Wounds	Touch	Instant
Detect Magic (MU & Clerical)	0	1 Turn (Cl) 2 rounds/level
Enlarge	.5/level	1 turn/level
Friend	0	1 to 4 plus 1 round/level
Magic Missile	6+1/level	Instant
Protection from evil (MU & Cl)	Touch	3 rounds/level (Cl) 2 rounds/level (MU)
Protection from Good (MU & Cl)	Touch	3 rounds/level (Cl) 2 rounds/level (MU)
Read Magic	0	2 rounds/level
Reduce	.5/level	Instant
Shield	0	5 rounds/level
Shocking Grasp	Touch	Instant
Sleep	3 *	5 rounds/level
Second Level		
Detect Invisibility	1/level	5 rounds/level
Find Traps	3	3 turns
Hold Person (Cl)	12 *	2/level
Invisibility	Touch	Until Attack
Knock	6	Instant
Mirror Image	0	3 rounds/level
Ray of Enfeeblement	1 + .5/level	1 round/level
Resist Fire	Touch	1 turn/level
Silence 15' Rad	12	2 rounds/level
Slow Poison	Touch	6 turns/level
Snake Charm	3	5-8 rounds
Spiritual Hammer	1/level	3 + 1/level
Stinking Cloud	3	1 round/level
Strength	Touch	6 turns/level
Third Level		
Animate Dead	1	Permanent
Blink	0	1 round/level
Cure Blindness	Touch	Permanent
Cause Blindness	Touch	Until Cured
Cure Disease	Touch	Permanent
Cause Disease	Touch	Until Cured
Dispel Magic (Cl & MU)	12 (MU) 6 (Cl)	Instant
Fireball	1+1/level *	Instant
Haste	6	3 + 1 round/level
Hold Person (MU)	12	2 rounds/level
Invisibility 10' radius	Touch	Until Attack
Lightning Bolt	4 + 1/level	Instant
Prayer	6 radius	1 round/level
Protection from Evil (Good)	Touch/10' radius	2 rounds/level
Protection from Normal Missiles	Touch	1 turn/level
Remove (bestow) curse	Touch	Permanent or until cured.
Slow	9 + 1/level	3 + 1 round/level

* Hold Person (Cl) has a range of only 6 sq. in the game.
* Sleep, apparently, is more like 3 + 1/level in range in the game.
* The range for the FIREBALL spell appears to be 10 + 1/level in the game.

Sokal Keep

1) There's a secret door in the NE corner, which gives way to the Secret Treasure Room. There, you'll find magic weapons and an armor.

2) In order not to fight with the undead patrols, Parlay with them Nicely and tell them SHESTNI, before speaking with Ferran Martinez, and SAMOSUD after that.

3) Whenever you encounter specters here, (At the south of the keep in the middle, and to the west of the Hobgoblin and Orc assault) Parlay Nicely and say LUX. This will save you a fight.

4) Tell the truth to Ferran Martinez, and you'll have cleared the Keep.

5) You can rest anywhere after defeating four undead patrols (If you leave the keep and then return you'll have to defeat another four patrols), or in the entrance, where you find the dead elf.

Kuto's Well

1) There's an Old Hag in the south building guarded by lizard men and giant lizards. Search her room and you'll find magic items there.

2) Climb down the well. In the top NE room is Norris the Gray's treasure.

3) Although there is no special mission to kill Norris, the Council will give you a reward both for clearing the block and killing Norris.

4) You can rest in the catacombs beneath the well after defeating Norris.

Mantor's Library

1) Don't enter the garden. There's nothing there except trouble.

2) In the History Section, search until you find the "Lex Geographica", "History of the North", and "Grand Historian's Records of the Arts of War". There's nothing else worth it here.

3) In the Rhetoric Section lives a basilisk, but there are no interesting books here.

4) In the Philosophy Section search until you find "Fyedeth's Discourses on Power" and "Urgund's Descriptions of Darkness".

5) There are no books worth it in the Mathematics Section.

6) When you leave the library with books, you'll be confronted by a spectre of the librarian. You'll have to kill him. The council will keep asking for books in the proclamations, but you can simply ignore them.

Podol Plaza

1) When you are in the mission, approach the structure in the center and listen. Enter disguised, and keep a low profile. After the auction finishes, return to the council for your reward.

2) When you come back after reporting the auction, you'll need ten random encounters to clear the block. Then you can rest anywhere.

Wealthy Area

1) Don't search the beds. There's nothing there and the orcs will come back.

2) Take the six leather holy symbols if you find them there. You'll need them to enter the Temple of Bane.

Temple of Bane

1) Mace will wait until you defile the altar and/or find all three treasures before he attacks. The treasures are, 2 north and 2 east, 9 east and 2 south, and 6 east and 5 south of the northern door. Search there.

2) Bring Dirtan with you. He'll work for free. Just go to Bishop Braccio when you are asked for, and he'll give him to you.

Cadorna Textile House

1) There's a well in the northwestern part of the block. Have a thief, wearing armor no heavier than leather, climb down. Agree with the guild master and he'll get you south without having to encounter any wandering monsters.

2) If you leave the block after defeating Grishnak, he'll attack you again. This is great, since he

has powerful magic-user scrolls with spells you can scribe. So just leave and come back until you have enough copies of the scrolls for every one of your spellcasters. Also take the brass key, as you'll need it to free Skullcrusher.

3) Skullcrusher works for free 'til you return to Phlan. He'll point the way to the ogre leader.

4) After defeating the ogre, you'll find the treasure. Don't open it, as it will be detected, unless the thief's guild counterfeits the seals. If you defeat 10 random encounters, the block will be cleared.

Kovel Mansion

1) Keep in search mode. The Mansion is full of traps and treasures.

2) When following the two thieves, follow the one going south after they split up. He'll guide you to most of the guild.

3) After defeating all of the thieves, the block will be cleared and you can rest anywhere.

Valhingen Graveyard

1) Don't go on the mission until the council gives you a magic Sword +1/+3 vs. Undead, and scrolls with restoration spells. The restoration spell will restore a level to a character which has been drained by a vampire, specter or wight.

2) There are three types of random monsters in the Graveyard: Skeletons, Zombies and Wights. Each is created by a specter working on the graveyard. After defeating one specter, you'll have to face no more of his type of monster. The three specters are in the southwestern building, the one directly to the northeast, and the one to the southwest of the building in form of a cross. Each is guarded by a squadron of his monsters, and the one in the southwestern building has the anteroom full of poisonous gas. Cast a bless and/or prayer spell before to lower the chance of your characters being affected.

3) In the building in the form of a cross is a vampire's coffin. Sanctify it.

4) In the building to the northwest of the coffin, guarded by specters, there is a buried knight who will give you magic items.

5) After defeating all three main specters, and the ones outside the Knight's tomb, go the northeastern structure, and enter through a secret door in the eastern part. Then descend. You'll face a vampire and a few were-dogs. Be careful of the charm-gaze of the vampire. After you defeat him here, go to where his coffin was. You'll face him again, although alone. After defeating him both times, the graveyard will be cleared.

6) You simply cannot rest in the graveyard until the vampire is vanquished.

Nomad Camp

Don't kill the nomads. It simply is not worth it. Accept to help them, kill three waves of kobolds (There will be no time to rest between waves), and accept the reward they'll give you.

Sorcerer's Island

1) When you enter, go directly to the right as soon as you can. You'll be teleported and you will have avoided the maze.

2) Keep in search mode. When you find teleporters, you'll also find a pile of rocks. Throw one in and then go through, except in the first one.

3) After the first one, go north and then east to the next teleporter. Then follow the long corridor until you find the next one. Then go north, and finally through the door, saying the password.

4) The password is NOKNOK.

5) Hit the machinery, and then run for your life. Don't stay to inflict more damage to it.

6) In the southern room you'll find lizard men. Free them and don't fight them.

7) After you kill Yarash, you'll find a dial on the north wall. Gold, Silver and Copper will send you to treasure rooms, while Blue will get you to the main corridor in the entrance.

Kobold Caves

1) Enter through the large cave. After defeating the wyvern you can rest a while. Go north and find its treasure.

2) Keep in search mode.

3) Wake the guard. He'll take you to the king. Everywhere he taps there's a trap.

4) In the northwestern part there is a prison with a princess. Free her, and she'll fight fanatically against kobolds and will not charge for her services.

5) You'll face three waves in the throne room, with no chance to rest between them. If you need to heal someone, choose Continue Fight after killing all of them, and heal them. The first wave will consist of kobolds, kobold archers, and 4 trolls. Between the first and second wave you'll be hit by volleys, so don't have characters with too low HP. The second wave consists of Wild Boars, kobolds, and kobold archers. The third consists of two human magic-users, some trolls and some Wild Boars.

6) After the Kobold King is dead, you'll have dealt with the kobolds. In the northeastern part is a treasure room, and in it a bottle, which contains an Efreet who'll help you battle the vampire in the Graveyard if you haven't defeated him yet.

Zhentil Keep

1) The papers you bring have orders to kill you. However, it will take a while to the Keeper to finish reading it. At dinner, talk about as much as you can, and sleep with a guard.

2) After the guards try to kill you, you have two choices. You can run like hell to the exit, or you can approach the keep in the center. If you do the latter, you'll start facing waves of guards until you face the Commandant. That will be the last encounter and the Keep will have been cleared. Both, however, will yield the same reward. You simply get more experience by killing everyone off, but you are more likely to die yourself.

Buccaneer's Base

You can only enter the Base if you are on a Mission to rescue the child. There are two ways of rescuing him:

1) Go to the Animal Pen, release the animals, who will start a stampede. This will distract the guards, and you can free the child, and run for the exit. A few guards will spot you, but you can deal with them.

2) You can try to enter the Captain's quarters in the south, or the Slave Pen, by force. After a few waves of guards, you'll face the captain. After killing him, the camp will be cleared.

Both ways yield the same amount of reward. Once again, you'll get more experience by doing the latter, but you are more likely to be killed too. Those encounters get harder and harder.

You can rest where they take you when you enter the camp.

Lizard Men Keep

If you freed the lizardmen in the Sorcerer's Island, tell the chief the word SAVIOR when you find him. Then champion him. If you defeat the challenger, the Leader will pledge not to attack Phlan, and you can collect your reward. Otherwise, you have to kill all lizardmen on the surface, and all giant lizards beneath to clear the block. There is a anti-magic shell in the whole keep, so no spells will work. Keep this in mind.

Stojanow Gate

1) If you disguise yourself with a wagon, you can get past the bugbears in the entrance. Then attack each tower separately. When the alarm sounds, you can rest it off. It only lasts an hour. Then go back and kill the bugbears, and the gate will be taken.

2) If you don't want to get disguised, you'll have to face the bugbears and the ettins and magic-users all together. Good Luck!

3) The man with the wagon is only there during daylight hours (0.00 - 12.00)

Valjevo Castle

1) There are two entrances to the Maze. The one on the southeast is the better one. Just say the word RHODIA to enter.

2) The alarm only lasts one hour. If the alarm is off, you can rest anywhere. When the alarm is on, the maze and castle proper are full of poisonous snakes.

3) There are two entrances to the castle. The one on the southeast gets you to a false Tyranthraxus, so take the one on the northwest.

4) When you have an encounter outside the maze, parlay with them. Choose Meek and say HARASH, or Abusive or Haughty and say Tyranthraxus, and they'll leave you alone.

5) On the top floor, don't go east. The room there drops you into a Medusa's lap.

6) If you go to Genheeris Office in the northwest, parlay choose Meek or Nice. They'll offer you to join and kill Tyranthraxus. But if you don't go to the south to kill him immediately, he'll slip away. He carries a Lightning wand.

7) Tyranthraxus Lair is a hard encounter. First you have to defeat many guards, who are six level and therefore immune to sleep spells. (After the 5th level, sleep spells don't affect you). And they have many HP. So use Hold spells and Stinking clouds to kill them off. Then don't accept Tyranthraxus offer. Save a few Stinking Clouds for him. Spread, since his breath is very dangerous, and you'll be better off if he only kills one of your characters. He is not affected by Fireballs, Lightning bolts, sleep, charm, or hold spells, and he is very hard to hit. If you manage to dispell his magic with a Dispel Magic, then Magic Missiles will hurt him and he'll be easier to hit. Or you can cast a stinking cloud on him, and keep hitting him with magic missiles and arrows. DON'T APPROACH HIM TO MELEE DISTANCE! He'll kill you for sure. Then try casting, while he is on the stinking cloud, some dispel magic, and also try to Paralyze him with a wand (I don't recall where you can find one, but you can). After he is paralyzed, get him. Then, go to the Council and collect your reward. You've Won!

Miscellaneous

1) There is a silver dragon near the Barren River's source. Follow it, and then go one square north and one west. Ask humbly for his help, and for God's sake don't fight him. He'll give you a few pointers.

2) You can try to rest anywhere in the wilderness, but you can always be interrupted. This, however, seldom happens.

Adventurers Journal

A) *Proclamations of The City Council of New Phlan.* The true proclamations are: LIX, CI, CX, CXIV, CXXVI, CXXIX, CXXXIV, CLIV, CCI, CCIV and CCXIV.

B) *Journal Entries.* The true entries are: 3, 7, 8, 10 (Map of the southern part of Cadorna's Textile House), 11, 14, 15 (Map of the southeastern part of Valjevo Castle's Maze), 16, 17, 18, 19, 20, 21, 23, 25, 26 (Map of the maze on the bottom part of the Sorcerer's Island. If you followed my instructions, you bypassed it), 28 (the location of the Nomad Camp relative to the Kobold Cave), 29 (NE of Valjevo Castle's Maze), 30, 31, 33, 35, 37 (Specially useful maps of the city and the area), 41 (NW of Valjevo Castle's Maze), 42 (Sketch of the Kobold Caves), 43, 46, 47, 48, 49, 50, 51, 55, 56, and 57.

C) *Tavern Tales.* Most tavern tales are simply scenes from the tavern. However, Tales 1, 3, 16, 21 and 23 are worth noticing.

This is all, for now. Keep up good work.

unClassifieds

RDEX Contributors:

Most Wanted

72 50 Mission Crush, SSI
65 Airheart, Broderbund
63 Alcon, Taito
63 Alien Mind, PBI Software
73 American History Explorer Series, Mindscape
72 Ankh, Datamost
73 Ant Farm, Sunburst
67 Apple Panic, Broderbund
67 Aquatron, Sierra
69 Axis Assassin, ?
63 Bad Street Brawler, Mindscape
68 Bank Street Writer Plus, Broderbund
73 Bank Street Beginner's Filer, Sunburst
73 Bank Street School Filer, Sunburst
63 Beyond Zork, Infocom
65 Bilestoad, Datamost
69 Blue Powder - Grey Smoke, Grade
63 Border Zone, Infocom
65 Borg, Sirius
67 Bouncing Kamungas, Penguin
66 Boxing, ?
63 Bubble Bobble, Taito
65 Bureaucracy, Infocom
69 Caverns of Callisto, Origin
68 Centauri Alliance, Broderbund
69 Checker, Odesta
69 Chess 7.0, Odesta
69 Chuck Yeager's Advanced Flight Trainer, Electronic Arts
67 C'est La Vie, Adventure International
68 Comics, Accolade
63 Cosmic Relief, Datasoft
65 Crime & Punishment, Imagic
69 Crossword Magic v4.0, ?
69 Cybernation, Nexa Corp.
72 Cytron Masters, SSI
66 Deathlord, Electronic Arts
69 Delta Squadron, Nexa Corp.
67 Desecration, Mind Games
73 Designer Prints, MECC
66 Disk Optimizer System, Nibble Notch
65 Dondra, Spectrum Holobyte
69 Dragon Eye, Epyx
69 Dueling Digits, Broderbund
68 Dungeons and Dragons, Master Assistant vol2, SSI
66 Dungeon Master (IIgs), FTL
62 DROL, Broderbund
72 Epidemic, SSI
67 Epoch, Sirius
63 Explore-Australia, Dataflow Computer Service
67 Evolution, Sydney
67 Falcons, Piccadilly
68 Factastics Trivia, Daystar
69 Flt Wars, Sirius
67 Force 7, Datasoft
72 Gamma Force, Infocom
69 Gemstone Healer, SSI
73 Geometric Supposer (the), Sunburst
66 GEOS, Berkley Softworks
71 Gertrudes Puzzles, ?
72 Galactic Gladiators, SSI
63 Gladiator, Taito
66 Goldrush, Sierra On Line
67 Gorgon, Sirius
66 GradeBuster 1 2 3, Grade Buster
61 Gutenberg Sr., Micromation LTD.
65 Halls of Montezuma, Electronic Arts
69 Hard Hat Mack, ?
67 High Orbit, Softsmith
67 Horizon V, Softsmith
69 Impossible Mission, Epyx
62 Indoor Sports, Mindscape
68 Infocomics, Infocom
66 Jane, ?
63 Joker Poker, Mindscape
72 Kabul Spy, Sirius
71 Keyboarding Klass, Mastery Developement
68 Kingdom of Facts, Santa Barbara/Thunder Mountain
72 Lane Mastodon, Infocom
67 Lancaster, SVS
72 Laser Force (IIgs), Britannica
66 Legacy of the Ancients,
65 Lost Tomb, Datasoft
65 Manhunter New York IIgs, Sierra On Line
65 Mavis Beacon Teaches Typing (gs), Software Toolworks
73 McGraw-Hill Problem-Solving Level 5 and 6, Tom Snyder
67 Microwave, Cavalier
66 Might and Magic II, Activision
73 Mind Castle I, MCE Inc.
69 Minotaur, Sirius
63 Modem MGR, MGR Software
68 Mr. Pixel's Cartoon Kit, Mindscape/Thunder Mountain
63 National Inspirer, Tom Snyder Productions
66 Observatory (The), Mindscape/Lightspeed Software
66 Odin, Odessta
63 Operation Wolf, Taito
67 Pensate, Datasoft/Softdisk
69 Phantasie II, SSI
67 Phantoms 5, Sirius
67 Pig Pen, Datamost
67 Project: Space Station, Avantage
67 Pulsar II, Sirius
68 Pure Stat Basketball, ?
72 Qix, Taito
62 Quadratic Equations II, Olympus Educational Software
63 Questron II, Electronic Arts
68 Rails West, SSI
63 Rastan, Taito
67 Rear Guard, Adventure International
63 Renegade, Taito
67 Rescue Raiders, Sir Tech
67 Rings of Saturn, Level 10, ?
66 Risk, Leisure Games
63 Rocket Ranger (IIgs), Cinemaware
69 Roundabout, Datamost
63 S.D.I. (IIgs), Cinemaware
72 S.E.U.I.S., SSI
62 Sea Stalker, Broderbund
67 Serpentine, Broderbund
72 Silpheed (IIgs), Sierra
68 Skeletal System, Brainbank
63 Sky Shark, Taito
63 Sound Song & Vision, Advanced Software
67 Space Ark, Datamost
62 Spare Change, Broderbund
67 Spectre, Datamost
62 Speedy Spides, Readers Digest
67 Star Cruiser, Sirius
67 Star Maze, Sir Tech
63 StickyBear Math: Add & Subtract, Optimum Resources
68 Stickybear GS Versions 3.5, Xerox
63 Strike Fleet, Electronic Arts
67 Succession, Piccadilly
65 Superstar Ice Hockey, Mindscape
61 Superstar Indoor Sports, Mindscape
68 Talking Text Writer GS, Scholastic
68 Tangled Tales, Origin Systems
69 Tetris (IIe), Spectrum Holobyte
72 Theatre Europe, PBI
65 Thunder Chopper, ?
63 Ticket to Washington D.C., Blue Lion Software
63 Tomahawk, Electronic Arts
68 Tomahawk (IIgs), Datasoft
69 Track Attack, Broderbund
68 Triad, Adventure International/Thunder Mountain
72 Triango (IIgs), California Dreams
68 Trinity, Infocom
68 Ultima Trilogy, Origin Systems
73 Unicorn 5.25" software
68 Volcanoes v1.8, Earthware Comp. Services
66 War in the Middle Earth, Melbourne
61 Wasteland, Electronic Arts
67 Wayout, Sirius
73 Where in Europe is Carmen Sandiego (3.5"), Broderbund
73 Where in Time is Carmen Sandiego (3.5"), Broderbund
63 Wings of Fury, Broderbund
63 Wizardry:Return of Werda, Sir-Tech.
68 Word Attack Plus (IIgs), Davidson
65 Works (the), First Star Software
67 Zenith, Softsmith
63 ZorkQuest, Infocom

IBM Most Wanted

72 GBA Championship Football, Electronic Arts
68 Graphitti, George Best Phillips Acadmey
61 Gunship, Microprose
63 Heros of the Lance, SSI
72 Kings Quest III, Sierra
72 Operation Wolf, Taito
72 Radio Baseball, Electronic Arts
72 Ultima V, Origin

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