86 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 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 include 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. (You can write anytime!)

Jack Nissel (Disk Protection, 7-10PM EST) (215) 365-8160
Marc Batchelor, 6025 Coker St., Cocoa, FL 32927
Rich Etarip, 824 William Charles Ct. #2, Green Bay, WI 54304-4018

The BBS
(Bulletin Board System)

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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Our editorial policy is that we do NOT condone software piracy, but we do believe that users are entitled to backup commercial disks they have purchased. In addition to the security of a backup disk, the removal of copy-protection gives the user the option of modifying programs to meet his or her needs. Furthermore, the copyright laws guarantee your right to such a DEPROTECTED backup copy:

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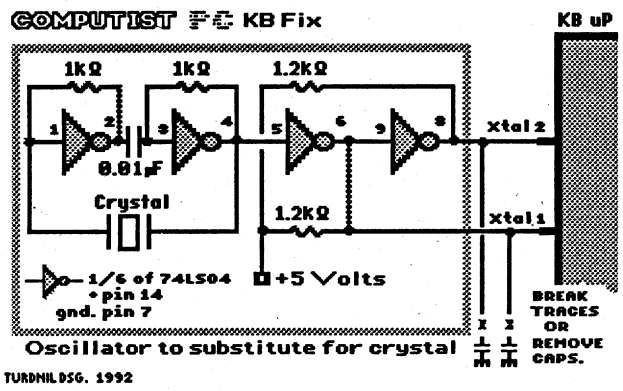

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Editorial Notes

It's a double issue, again! Some Computist readers think that I'm the "Man who wasn't there", based on how often they receive an issue and on how hard it is to get me on the phone. Sometimes I think that I took a nap and the world went on without me.

But I'm back. Really! Give me a call (206) 832-3055. Best time is between 1 and 5 PM (Pacific Standard Time) on Monday, Tuesday or Wednesday. Other times are iffy based on my workload. Also, if it's real important, the sysop (Vince Andrews) can usually find me. Though I've heard that he's also difficult to find sometimes.

Jeff Hurlburt TX

The PRODUCT MONITOR

RATINGS

Superb ★★★★★
Excellent ★★★★
Very Good ★★★
Good ★★
Fair ★
Poor ☹
Bad 💣
Defective

Stealth Computer?

Don't look now; but, while many Apple users have been scanning the horizon for a new II complete with "IIgs+" name plate, the REAL IIgs+ is approaching virtually undetected! A "standard" configuration remains to be defined; but, a system featuring 8-9 MHz cached 65816, 4 MB RAM, and 54 MB SCSI hard disk seems to be a fairly typical 'new gs' setup and is now well within the affordable range of many II users. (A 10 MHz, 8 MB RAM, 1 GB hard disk system is also available, but somewhat less affordable.) The name plate, of course, still says "Apple IIgs". The explanation is expandability. Your IIgs has lots of slots; and, as Intel likes to remind us in their "computer inside" '486 commercial, you can pack loads of power into very small spaces.

The heart of the almost-IIgs+ is Zip Technology's accelerator board. True, there's still room for competition; but, price, speed, and compatibility have made Zip IIgs a popular choice— popular enough, in fact, that developers are beginning to design software that doesn't run well on slower machines. In case you've been toying with the idea of a speed upgrade, here are some performance numbers (speed multipliers) for the 9 MHz, 32k cache Zip board recently installed in our vintage Woz IIgs:

Platinum Paint:

Fill a complex test pattern .....x 2.4

IIgs Finder:

Scroll a full screen of 'Viewed as Text' file names x3.5

Super Convert:

Remap 16-color 320 picture to 4-color 640 .....x 2.6

Convert to gif format (some disk access) .....x 2.3

Do horizontal flip of 320-mode picture .....x 2.8

Super Pac:

Pack super-res pic .....x 2.5

Appleworks 2.x:

Do search-and-replace thru 71k document .....x 2.8

The global effect is equivalent to a 7 MHz IIgs— not only faster; but, more important, 'Fast Enough' to handle many applications you've shelved due to slowness. Installation is easy. You just move your old '816 to the board, plug a connector into the '816 socket, and plug the board into slot 3 or 4. The small manual is supplemented by an on-diskette Hyperstudio stack which describes major components, DIP switches, and configuration software. The latter includes a GSOS utility plus a Control Panel CDEV and a CDA with installer. Each is a means of setting board defaults such as base speed, whether or not to slow down when outputting to the speaker, etc.. I ended up leaving the DIP switches alone, installing the CDEV, and leaving those settings alone, too. An 'acid test', running EA's "Instant Music", confirmed that, despite the speed boost, compatibility is maintained.

Meanwhile, even as RAM prices drop, attractive new resources like "Hyperstudio 3.0", Hyperbole, "Sound Smith", and Softdisk-GS's "Minstrel" NDA continue to make more RAM a worthwhile investment. By the end of '92, expect 2-3 MB to be the accepted standard. Similar forces are at work on the mass storage front. With OS 6.0, Byte Works's desktop programming environment, and all of those games and other utilities you want to have at your fingertips PLUS lower hard disk prices— well, the pressure to add or upgrade mass storage has never been greater.

So, why do I talk about an "almost-IIgs+"? Graphics! The 'bad news' is that no one has delivered a reasonably-priced IIgs display upgrade. The 'good news' is that it now seems inevitable that someone will. In fact, the movement to a bigger, faster IIgs is decidedly good news for all developers of IIgs products—hardware AND software. As users upgrade their machines they demand more powerful productivity wares, larger language systems, more awesome games, ... which, in turn, generates an interest in additional peripherals (like CD ROM, MIDI, color scanners, etc.) and still further upgrades.

Starting with the "II Revolution" column of summer '89 we've given the competition plenty of time to deliver a knockout blow. It never landed. Underpowered, under-promoted, and under-supported, the IIgs was replaceable; but, no manufacturer delivered a replacement! Legions of IIgs users, even as many also became enthusiastic PC owners, have stubbornly refused to bail out of II computing. Now, the same leading edge stuff that threatened to overwhelm the IIgs is starting to power-up thousands of machines via low cost plug-ins. We may never see a "IIgs+" name plate. Fair enough. The one on the Stealth Computer is looking better all the time!

Are We There Yet?

★★★★

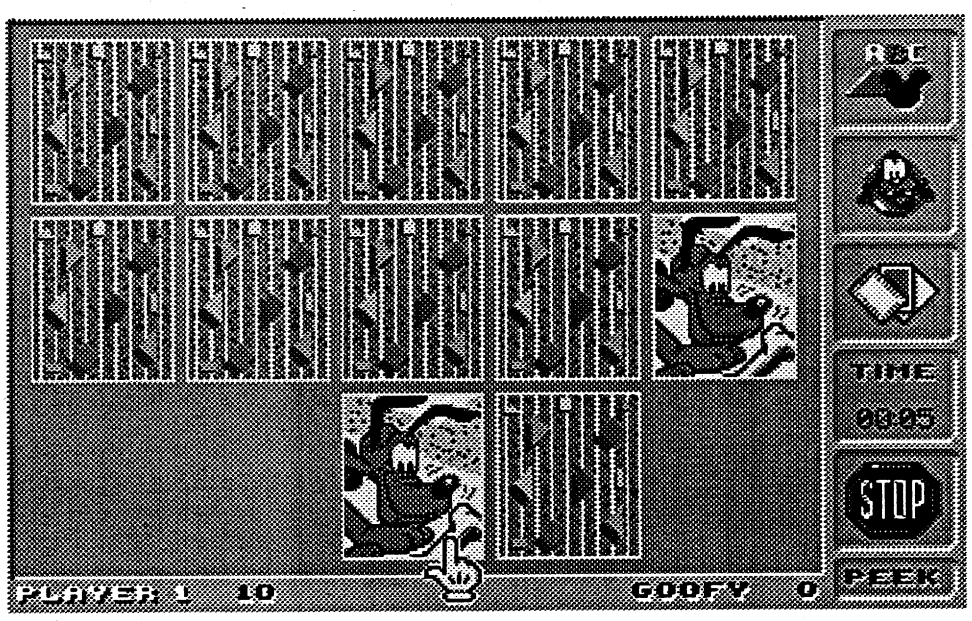
$49.95 for EGA-VGA 640K PC

Electronic Arts

AdLib, Sound Blaster, or Roland sound recommended

The Mallards, a typical Dad, Mom, Tiffany, and Blip American family, are off to see the USA by car. It's their vacation but it's up to you to make sure they see all the BIG attractions— like Old Rip, the Texas Horned Toad, the Goldfish Capital of the World in Arkansas, and Iowa's Birdland Park. Then, too, you're the one who gets them through Kentucky's Wandering Woods, the Alaska Ice Worm Festival, New York's Oztown, and the Paw Paw Tunnel in West Virginia.

The 'Where' is all 51 States—mouse-clicking a choice on the USA map produces a 'State Facts' display and takes you to the attractions. The 'How' is by cracking every conceivable kind of Maze, Word-match, Jigsaw, Crossword, Jumble, and Rebus puzzle. An on-the-box blurb claims 23 kinds. After a few hours of play and paging through the manual and the 'answers book' (included), I believe it!



The 'Why' is easy. EA's AWTY is a bonanza of 200-plus clever, attractive, challenging brain teasers backed by decent sound effects and upbeat music. Built-in Help/Directions displays smooth out the road while the multi-position Game Save keeps track of your progress. Are We There Yet? Nope; and the longer it takes the better. With luck, the Mallards' vacation could last all summer!

Mickey's Memory Challenge

★★

$29.95 for EGA-VGA 640K PC

Walt Disney

Disney's 'Memory Challenge 'mouses up' the tried and true "Concentration" game idea to deliver endless one or two-player competitions for ages 5-up. The "mouse" is the one you point-and-click to turn over cards and, naturally, Mickey. In a two-player game you play Mickey (roughest), Daisy, Goofy (easiest) OR a second human player. In the one-player version you can play against the clock or just take your time and practice finding matches.

Featuring attractive VGA-32 displays and AdLib/SB effects, 'Memory Challenge makes it easy to tailor game setup for any age user. A game can have 8, 15, or 24 cards— the fewer the larger with better detail— and the matching may involve Disney character Pictures, Pictures of objects, Character Names to Pictures, Words to Pictures of objects, and Words only. You can also set the number of "Wild" and "Bomb" cards, how long selected cards are displayed, and the game countdown timer.

With no voices and unspectacular effects, the package is a tad low on the pizazz scale— too low to hold the attention of most very young users playing alone. A second human player or any situation where someone can walk by and notice how well the player is doing (e.g. a classroom) makes all the difference. Older users find it much easier to 'get into' the challenge and may even prefer to play alone. (Well, I prefer playing alone; but, maybe, that's because my 'sharing skills' need some brushing up.) All two-player games, including those with computer opponents, are scored; but (a slip-up!), there are no High Scores rosters.

Supplied with manual on both 5.25" and 3.5" media, Mickey's Memory Challenge is good entertainment which also teaches. While Disney makes only modest 'educational value' claims, there's no question that object naming and word-to-object matching are helpful to reading development. A player also exercises 'visual memory', 'sound symbol-to-object' matching (i.e. you subvocalize "truck" to remember location of the truck picture), and gets some basic problem-solving practice. Anyone who tackles 'Memory Challenge can count upon learning something and, as usual when Mickey is around, having fun doing it!

The Godfather

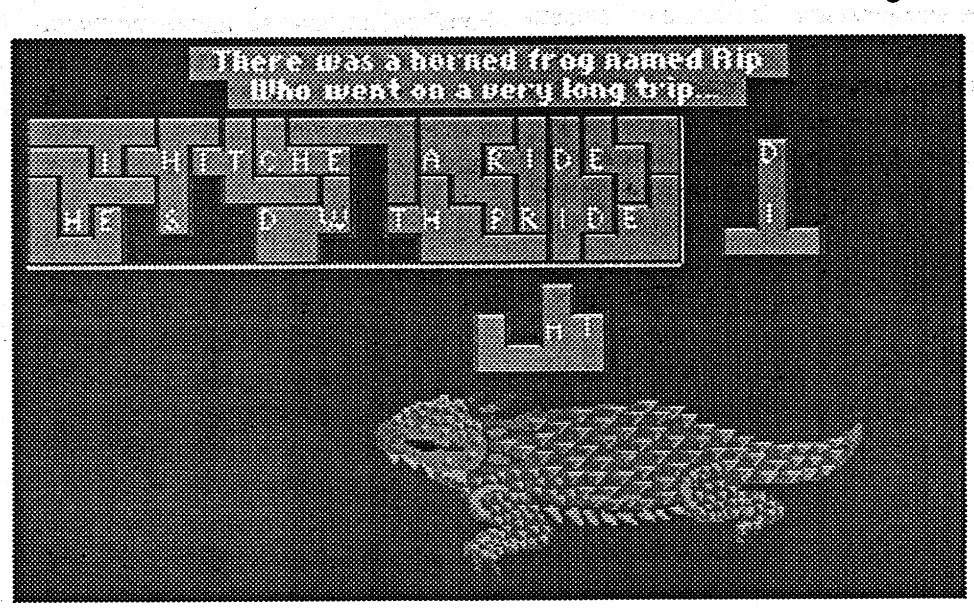
★★

$49.95 for 640K EGA-VGA PC

U.S. Gold

Joystick, Adlib/SB/Roland sound, and 10MHz minimum speed recommended

Your motto says it all: "You don't ask for power; you take it!" As the Corleone family's best hope for power, your goal in U.S. Gold's new action challenge is to



blast away any obstacle to the top job—even if it means potting every gunsel from the streets of 1940's New York to the waterfront of 1970's Miami.

As in "Robo Cop" and similar 'street battle' arcades, you guide your action figure along streets, docks, and other scrolled multi-screen Levels plugging enemies who may pop out of windows, zoom by in autos, or approach innocently among shoppers and other non-hostile bystanders. (Incidentally, blowing away a cop or a mother pushing a baby carriage is 'bad form' and costly to your status in the Family.) Sometimes, getting through a shootout yields only a minor increase in Family Standing; sometimes you'll collect a critical Vitality boost, a weapons power-up, a ticket, etc.. Clearing a large area can open the way to the next Level or to exploring a bar, casino, villa, yacht or other "Sub Level" interior. NOT clearing out the gunsels probably means you have been 'cleared'! If Vitality or 'Standing bar displays go to zero your career is over. There's no Game Save; so, you must start 'from scratch'.

In several tries I have, so far, managed to almost make it through the New York Level. True, you have natural-feeling, responsive joystick controls and can often duck or otherwise avoid bad guy shots. What makes 'Godfather so tough is attrition. There are many gunsels; some of their shots will hit; and Vitality boosters (first aid kits) are few and far between. 'Godfather NEEDS a Game Save ("Position Save", etc.) option. Exactly how one manages to deliver frame after frame of superb 32-color VGA artwork, realistic animation, and excellent sound and, then, fumble such an obvious design necessity ... ?! Anyway, the "Errata" sheet addendum included in the package has an error: the KB controls for left-right movement are I and O, not O and P.

The rating is for real (i.e. not just a 'consolation prize' for messing up and missing "Excellent"). Supplied with manual and a colorful "History" featuring movie scenes, 'Godfather IS six mega-bytes of addictive, fun-packed challenge somewhat torpedoed by the requirement that you replay the whole thing each time you are killed off. The road to power is tough and, occasionally, frustrating; but, if you're good with a 'stick, YOU could be the next godfather!

a few seconds or launch from GSOS. With it, you can edit standard II/IIgs font files up to 32K in size having up to 255 characters with a maximum point size of 127. This means that nearly all of the fonts you've garnered from Styleware, "SuperFonts", Softdisk G-S, and similar sources are 'fair game'. Since the simpler 'standard' fonts are often a good starting point, included on diskette is Chicago.12 (the startup font) along with Times, Courier, and Helvetica each in five sizes ranging from 27 through 72 points for good detail.

Whether you build from an existing font or click "New" and start with a blank slate, you always work from one of two screens. The Main Screen shows letters, numerals, and symbols in the usual ASCII order in a 16 x 16 grid. Only characters which have been defined show up here. For example, if "A" appears in the grid, then some kind of character exists for the place normally reserved for "A". For any characters to be typed using CTRL and OPTION keys (i.e. with ASCII values outside the usual displayable character range), the program uses an assortment of non-standard symbols to indicate defined characters.

To the right of the grid a Samples window shows existing characters (as many as will fit) as they actually appear in 560-dot monochrome double-hires.

than mouse-penciling 'fat dots'. Other clickable tools include Eraser, Line, Rectangle, and Oval plus Marquee (sizable "selection box") for cutting, copying, and pasting. Each 'fat dot' of height corresponds to a "point" of size; so, the work area can easily display characters from most fonts in their entirety. To deal with very large characters a Hand tool moves you through the whole 127 x 127 workspace.

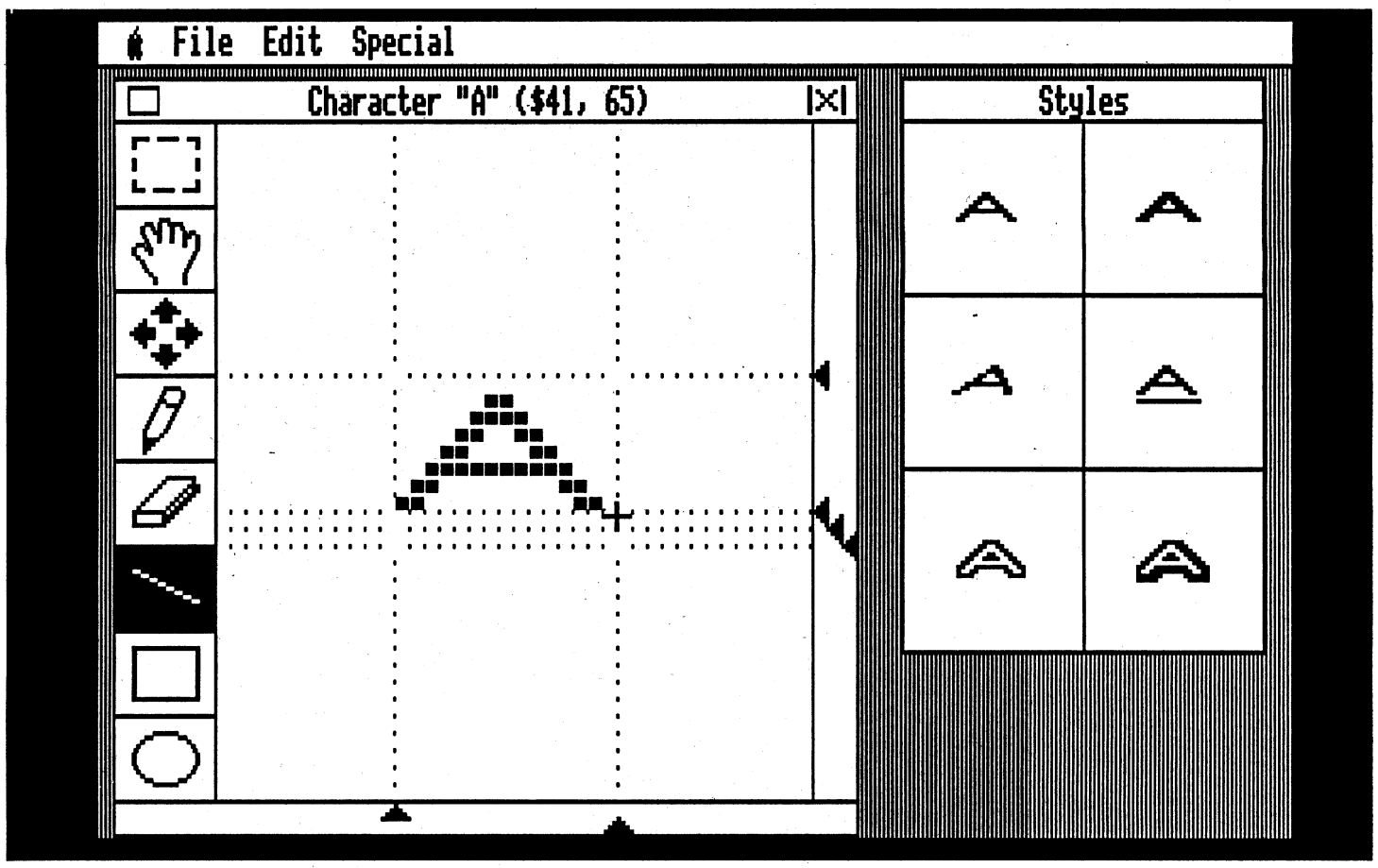
Click-and-drag tabs just below the display let you quickly set leading and trailing spaces, if any. Similar tabs along the side set vertical height of the character space, base line, descender distance, and single-space distance. Since character space height is constant throughout the font, vertical settings affect all characters; they need be set just once and will be in effect even for blank workspaces. Any drawing beyond vertical limits is ignored. Horizontal limits are individually settable and do not crop drawings. This lets selected characters join or even overlap other characters.

Font forging is fun; and, you will immediately want to try out your creation. However, before you stick the new font into a GSOS system disk's FONTS folder, you need to be sure that your application will be able to use it. "Platinum Paint", "Hyperstudio", and similar GSOS-based programs expect to find available font names in the Times font files are in the FONTS folder.)

Evidently, some early IIgs software was fairly picky about font naming, even discriminating among font names according to case. ("Narf" and "NARF" would be different.) A little experimentation indicates that GSOS and the associated tools do not care. In fact, according to the "Toolbox Reference" (vol. 1), the FONT tools use ID#, Size, and Style to zero-in on each specific font. Since many fonts have the same size and most are stored as "Plain" Style, it is important for the Times, Helvetica, Shaston, ..., AND Narf families to have different ID#'s. If your new font's ID# is the same as that for some different font already present in the same folder, it is likely that one or the other font's name will not show up in selection lists.

GS Font Editor's Style default is "Plain"— good, since your painter utility, etc. can access the tools needed to produce "Bold", "Outline", and other styles. Unfortunately, the editor's "Get Info" box limits ID# display and entries to the range 0-255 (the low byte of the ID# value). The actual range allowed is 0-65535.

Unless you have an unusually large collection of fonts in your SYSTEM/FONTS folder, you can feel fairly confident that picking a number between 200 and 230 will avoid conflicts. To



GS Font Editor

★★

$49.95 for 128K Apple IIe, IIgs

Beagle Bros

Looking for just the right font? Maybe you've nearly finished an "Amazon Animals" Hyperstudio stack and need some 'Amazon-type' capital letters (like with vines, tree frogs, claws, etc.). Maybe the idea is to produce a booklet 'written' using Egyptian hieroglyphics; or, maybe you want your "Appleworks GS"-printed correspondence to duplicate the 'look' of some in-use company logos. Even if your II/IIgs fonts collection runs from Antripa to ZooLoo, the 'right font' for your next production may be the one YOU create!

Featuring a responsive point-and-click interface and crisp monochrome double-hires display, GS Font Editor is a ProDOS 8 application you can boot in

Clicking the Samples window clears it for typing-in characters which may not have been visible or to check the appearance of certain combinations of characters. (Once cleared, however, there is no quick way, aside from reloading the font, to restore the original Samples display.) Another feature, the "Scale Font" option, lets you quickly produce a larger or smaller size version of all the characters in your font. It's a fairly crude operation; so, some editing to smooth-out rough edges is almost always necessary. You may also Cut, Copy, and Paste whole characters on the Main Screen; but, its chief function is selecting characters to edit or to create 'from scratch'.

Double-clicking a character's box in the Main Screen grid gets you to the Edit Screen. This shows a 40 x 40 'fat bits' view of the selected character along with actual-size views of its current appearance in Plain, Bold, Underline, Outline, and Shadow styles. Producing a character's form involves little more

FONT.LISTS file in SYSTEM/FONTS. To get your font into this list the file (e.g. "Narf.8") should be in the FONTS folder at the time GSOS is started AND the FONTS tool must be able to see that the new font is unique.

The catch is that the file name "Narf.8" means very little to the FONTS tool set. It gets the font Family Name, point Size, and Family ID Number from the first few bytes saved in the file. This is the information you enter via GS Font Editor's "Get Info" function in the "Special" menu. "Times.12", for example, has the Family Name "Times", Size is 12, and its Family ID# is 20. "Times.16", "Times.24", etc. all share the Family Name and ID#. FONTS tool set routines use this information to avoid duplication in font selection lists and to decide which point sizes are directly available for a given font. (So, "Times" appears only once in "Platinum Paint"'s font list and the numbers 12, 16, and 24 will be highlighted Sizes if the corresponding

enter a value larger than 255, you can edit the font file directly via a utility like "Copy II Plus" or "Block Warden". As a guide, the "Narf.8" font belongs to the "Narf" family with ID# 57638 ($E126), Style= "Plain", and Size= 08. The NARF.8 file begins as follows:

```
0000- 04 CE E1 F2 E6 06 00
                        (Family Name)
0007- 26 E1              (Family ID#)
0009- 00 00                 (Style)
000B- 08 00                  (Size)
```

Of course, the best way to get 'good numbers' is to register your fonts with the Fonts Clearinghouse! The creation of an Apple II devotee named Mark Collins, the Clearinghouse helps maintain order in fontsville by recording names and supplying ID numbers. You can contact the font guru at one of the numbers listed in the Vendors section or just send your font on diskette to the Fonts Clearinghouse address. (Don't worry about ID#; if the one you've picked

is already in use, Mark will assign another.) For mail-ins, it's probably a good idea to include a stamped, self-addressed envelope to help defray costs and speed up the return of font verification documents. I have sent in Narf on diskette. I'll let you know when it joins Times, Courier, Helvetica, et al in the Font Hall of Fame!

Hardly anything in computing is more fun than creating something you and other computists can actually use. It's even more fun when the medium makes it so easy to give your ideas form. Beagle's font editor scores well here, though, clearly, no great pains have been taken to harness IIgs capabilities. The 32K size limit, non-super-res display, non-scrolling Samples window, and absence of a full-screen Edit window option are areas where 128K IIe/IIc compatibility takes a notable toll. It would be especially handy to have quick access to font viewing in both 320 and 640 mode super-res. Still, there's no denying that GS Font Editor gets the job done. Supplied on 3.5" and 5.25" media, this is serious "productivity" stuff— a nifty font-forger and not a bad entertainment value.

Elvira II: The Jaws of Cerberus

★★

$59.95 for VGA 640K PC

Accolade

AdLib, Sound Blaster, or
Roland sound recommended

For someone who's constantly referring to you as "birdbrain", Elvira does seem to get herself into some ultra-dumb messes. This time, her magical meddling has attracted more spooks, ghouls, vampires, giant bugs, and demons than a ouija board factory; and, they've all set up shop in the Black Widow Productions studio complex. Worse yet, each of the three major sets has sprouted its own deadly underground labyrinth; PLUS, even worser(!), Elvira has gotten herself into the clutches of the ace demon, a gigantic three-headed dog HQed somewhere far, FAR below. "Wow! Bummer! Like a dude would have to be seriously birdbrained to get anywhere near a scene like that!" Right.

You arrive a few hours after sunset. As in the first "Elvira", Elvira II' delivers large, richly detailed, 3-D views with user-friendly 'point-and-grab' manipulation of visible objects. There's another fine music/effects soundtrack and, lest horror fans be disappointed, an ample supply of truly grisly scenes. Once again, you will search rooms, clamber up and down shafts, and tread corridors in constant dread of seeing a flesh-dripping ghoul round the corner. The killer falcon, alas, is gone; but, nicely animated giant mosquitoes and huge ground-ripping worms more than take up the slack.

More monsters, more items, more obstacles, more gamescape (Accolade claims five times more!) ... . "More" does summarize many of the changes wrought by the Horror Soft design team to produce the latest "Elvira". Dispatching baddies, cracking puzzles, etc. still boosts your Level and adventuring attributes. Now, however, you get to start off as one of four character types (e.g. Stuntman, Programmer, ...) offering different attribute mixes. New panels on either side of the main display deliver more status info, too, like Spell(s) in Effect, Health (hit points) per body part, and "Seismic Monster Detection" good for several paces in every direction.

Elvira, of course, is not available for spell-mixing. Instead, you find her spell book and produce Antidote, Ice Dart, Telekinesis, and the other 24 spells yourself. Since the mundane offices, dressing rooms, etc. of BWP is (once cleared of witches and ghoulies) your safe 'home base', it's a good thing that many of the ingredients turn out to be 'everyday items'. For instance, you get a Fireball spell for some "combustible substance" (like a postcard) and Magic Muscles for "three metal objects" (like spoons found in the BWP Canteen). Part of the challenge (and the fun) is figuring out which items match ingredient descriptions such as "any edible fungi" or "any absorbent object". Which is not to say that weird goodies (brains, jewels, witch eyes, etc.) are out. In general, the more cogent the enchantment, the rarer and/or more arcane the required ingredients and the higher the Level needed for successful casting.

As you may recall, the original "Elvira" took a pretty stiff hit, rating-wise, on the grounds that it is too easy to make a fatal error and play on and on and ... with no way to win. (You must use the "optional" clue book as a kind of second manual.) So far, in several hours of play, I have not detected a similar problem in Elvira II'. If a player ignores in-game hints, grossly wastes resources, and arrives at a position which is, for all practical purposes, dead lost, the situation will be fairly obvious. (Whereupon it's time to Restore from one of several earlier Saved games.) Players who enjoy mapping may, just possibly, be able to win without extra information. "So, should I invest $10 in the 65-page Clue Book?" (Does Superman fly? Is Elvira talented? Is the game laced with tricky puzzles, multi-level mazes, and nasty traps? Are you kidding?!)

Sometimes, as when dealing with a mad scientist type in the basement, you will depend upon guile (like conversation choices and disguises). Mostly, you either see a for-real monster coming and run, or you fight. Combat is still 'real time', featuring simple cut/slash and spell-casting options. (However, you no longer get to see the bloody slashes you inflict upon enemies! Too bad; the separate bar graph 'meters' to indicate severity of each hit landed and taken are a notably less juicy substitute.) This scheme works well enough in the first "Elvira" and the non-maze areas of Elvira II', where combat takes a clear second place to exploration and puzzle-busting. It's barely adequate for the "Dungeon Master"-style challenge of monster-drenched mazes. The game should offer better weapon choices, some kind of weapon 'hit power' number, and easier access to attack spells.

Will you still love her in Elvira II'? Probably. The old castle had more 'atmosphere'; the BWP setting, with "additions", has more stuff. Besides, Elvira is down there somewhere— beneath nearly 6 MB of vampire-polluted sets, weirdos, carnage, and triple-branching underworld— just waiting to be snatched from the very 'Jaws of Cerberus and call you "birdbrain"!

Apple IIgs GS/OS Device Driver Reference

★★★

$35.00, 336-page looseleaf

Addison-Wesley Publishing

One of the major differences between programming a GSOS application and one for, say, DOS 3.3 is the level at which connections to hardware devices are made. For DOS 3.3, it is fairly normal to program "low level" assembly or machine language routines which tap into DOS code or even to add custom patches. Additional low level routines might be needed to control your display, printer, and other non-disk hardware. In GSOS you can talk to all kinds of hardware devices; and, programs usually connect at a higher level, via well-defined software interfaces called "device drivers".

Apple's 'GS/OS Device Driver Reference is divided into two major sections. Part I explains what is meant by "Device Level" in GSOS, documents direct application-to-device calls, and supplies details on several drivers (SCSI, AppleDisk 5.25 and 3.5, UniDisk 3.5, AppleTalk, and GSOS-generated). Part II explains how to write a device driver and includes documentation of the calls to device drivers used by FST's and other GSOS components along with driver error codes. In the Appendices you find a GSOS Error Codes listing and information for users who wish to design BASIC, SmartPort, etc. peripheral cards. As usual, there's a glossary to help navigate the occasional lapses into 'system-ese' and everything is nicely indexed.

Looseleaf is, probably, my least favorite format— mainly, binders are too large for many shelves, too bulky for easy handling, and the pages tend to catch on the rings. Still, with crisp diagrams and tables, ample 'white space', and clearly-written text, there's no getting around the reference's 'useability'. Good thing! Now that the IIgs is making a comeback, many advanced users— programmers who wish to tailor Library interfaces, hardware designers, etc.— will need the this kind of device driver information.

In fact, to be reasonably sure of comprehensive DD coverage, they/you will also need the 'GS/OS Reference because the 'Device Driver Reference does not, for example, cover ProDOS 16 device calls. ... which leads me to trot out a pet peeve (pet, pet): While the quality of IIgs documentation remains very good, it's organization is approaching nightmare status. The 'Hardware Reference, 'Firmware Reference, et al work like a bureaucracy with each jealously guarding its informational turf from the other references. Indeed, one reason for being leery of bulky binders is that tracking down some bit of IIgs lore can easily require laying out four or five manuals!

APDA may, eventually, undertake a full-scale reorganization— for instance, start by combining the hardware, firmware, and "programmer's intro" books into a real User's Manual. Now that Resource Central is running the show for Apple such grandiose undertakings are, at least, 'thinkable'. In the mean time, RC might borrow an idea from game makers: publish an annotated Master Index for 'solving' the manuals. Sure, as long as the 'GS/OS Device Drivers' manual and other IIgs books 'deliver the goods' they will sell just fine; but, The IIgs References Clue Book would be APDA's best seller ever!

Lost in LA

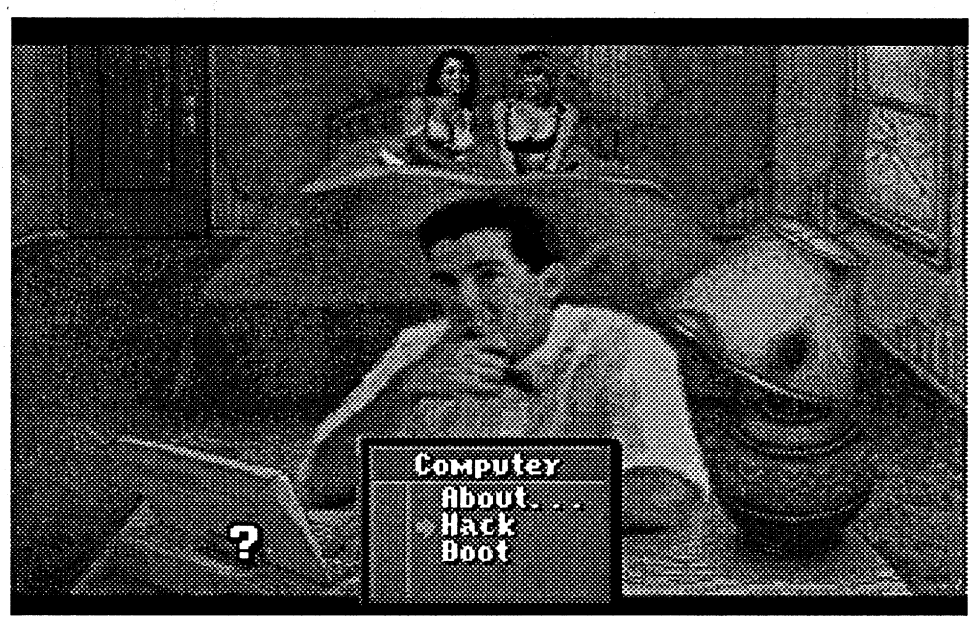
★★★ PG-13

$59.95 for VGA 640K PC

Accolade

AdLib, Sound Blaster, or
Roland sound recommended

Deja vu?! It hit early one morning when a cable TV show which likes to



feature U.S. vacation spots happened to pick the Hollywood Blvd./Venice Beach area of LA. Suddenly, the theaters, shops, beach, ... everything was so familiar: "Hey, I've been there!" Yet, in fact, I have never been anywhere close to Los Angeles. Eventually, the truth surfaced. As Les Manley, intrepid computer hacker and investigator, I have walked down those streets, been to the beach, and even stopped by "the pit" to question a pair of iron-pumping beach bunnies. Heck, for nearly three days, I was Lost in LA!

You do not come to LA to solve the mystery of celebrity disappearances; but, when a long time pal, Helmut Bean (the world's smallest strongman) turns up among the 'disappeared', Les Manley is on the case faster than a Rodeo Drive charge card. Mouse-guiding your Les figure along Venice Beach, checking out "the pit", mud-wrestling curvaceous cuties, and getting 'discovered' on the set with rock star Maladonna— well, no risk, no sacrifice is too great for your buddy Helmut!

Still, there IS a mystery to unravel; and, as the occasional animated cut scenes reveal, an evil genius (complete with secret lab) to unmask. So, besides classy Rodeo Drive boutiques and glitzy star-packed parties, you will visit your share of sleazy hotels, pawn shops, shadowy museums, and pitch-dark horror flick sets.

As in "Altered Destiny", the Lost in LA challenge is chiefly to acquire items and information which lead to other items, more juicy clues, and more ways to get past obstacles. For example, you can't obtain vital info from the LAPD data base without a modem, a computer, a hotel room, and the password. Which means you must face down a rap group street gang, deal with a fence, check out a photo parlor, and "lose" the mud-wrestling match. (Which means you had to find some film, get a ticket, etc., etc. ...) By any reasonable 'get-stuff-go-places-do-things' standard, this should be a long-playing adventure. Yet, thanks to realistic 3-D views, easy movement, 'common sense' connections, and ample in-game hints, threading your way to the Big Showdown may occupy only 10-15 cluebook-free hours.

"Whoa there, big fella! What sort of adventuring value is that?!" Okay, besides a solid scenario, clever humor, and some decent mini-puzzles, just having an excuse to roam around La La Land via colorful VGA scenery and quality AdLib/SB/Roland sound is part of the attraction. Also, many of the cut scenes and sequences feature digitized images of real models! I demoed the game for Baywoof; and, after winning, loaned it to another friend. So far, no one has complained strongly about playing time. A highlight seems to be the mud-wrestling sequence featuring a bikini-clad duo (workingitized images of real models! I demoed the game for Baywoof; and, after winning, loaned it to another friend. So far, no one has complained strongly about playing time. A highlight seems to be the mud-wrestling sequence featuring a bikini-clad duo (working their way to Cal Tech computer science degrees). As one female 'Computer Room' visitor asked: "Hey, where's the mud?!" (Good question! For some reason that detail had escaped my notice.)

Guest Reviews

688 Attack Sub

review by Douglas Hecht

Welcome aboard Captain. You are now commanding either an American Los Angeles or Soviet Alfa class nuclear submarine. You have your choice of 10 challenging missions that you can pick from. You can either battle the computer in all 10 or have a battle with a friend via modem in six of them. If you choose to you can even play the simulation from the Alfa in Russian.

Once you decide which one, where, who and what language (nobody said that being a Captain would be easy!) you go to your subs Conn to get to the radio room to receive your orders from Rear Admiral J.W. Ratcliff, (who can be a real tough guy if orders aren't followed to the letter). You must have your user manual handy when you send for your orders because, unless you have the Security Access Keycode (this changes every time you get orders from the 'Big Fish') you don't get past the conn to play the game.

After your orders are received, this Electronic Arts simulation puts all the major systems of a modern attack sub at your disposal. The navigation system will help you find your enemy. The sonar system will help you identify your enemy with its towed array (you don't want to blow up a friendly!), then escape quietly after you have blown him up with your guided weapons system (your arsenal contains the latest state of the art torpedoes, noisemakers and missiles). The other systems that you have at your finger tips are the radio room, (just in case you forget your mission orders or if you are playing by modem you can communicate with your opponent), the helm and of course a periscope.

The only downside that I can find is that, if you are running the game on a low speed machine, (I ran it on a 286-10), you cannot fire more than two weapons at a time: i.e. one torpedo and one missile or two missiles etc.. This has always proved to be enough firepower, however, having the option to fire at more than two targets at once would be nice.

688 ATTACK SUB ($49.95 for CGA-VGA 640K PC) gives its players simple to follow instructions and is supplied on two 5.25" diskettes, which will provide lots of fun and excitement. Voyage to The Bottom of The Sea Was Never This Good!

Mig-29 Fulcrum

review by Douglas Hecht

So ya saw the Soviet MiG 29 at the Paris Air Show last year and wondered if it flew as well as it looks? Let me assure you, it does! (At least this simulator does!)

DoMark's impressive little flight simulator for the MiG 29 ($49.95 for CGA-VGA 640K PC) is really a blast to get off the ground. From the time that you fire up the software, to the time that you exit the excitement is just about non-stop. (Deciding when to exit is the hardest part of the whole game; I lost five hours the day that I installed it!) . You begin your first mission as a trainee. During training you learn how to use the MiG's control panels, command systems, heads up displays, (which are more realistic looking and acting than most other simulators on the market in my opinion) and weapons systems. Then you solo and practice on the target range. However, you don't stay a trainee long. You move on to much bigger and better things!

There are six solo missions for you to complete after training. Each of the first five solo missions features a different aspect of flying the new MiG (i.e. air to air combat with Sea Harriers and Shenyang F 7M's, avoiding S.A.M.'s, blowing up ground targets such as offshore oil rigs etc.). These missions also allow you to earn points so that you can progress to the BIG mission.

The Final Mission requires proven skill in all aspects of the MiG and a minimum of 500 points. (Sorry no short cuts in this Air Force.) Don't expect to get through it in a short period of time either! The "Desert Strike" mission can take as long as all the others combined. But, the really intense graphic's, (in VGA), great AdLib/SB sound effects, excitement, and the pure concentration that it will take on your part to get through alive, will make it well worth the time spent.

The simulator comes on three 5.25" diskettes, a very simple to understand user manual that contains the MiG 29's history and; a full color poster of the with a cut away view showing the entire layout of the jet, specifications and a shot of the cockpit. (WARNING: This game can be very addictive!)

Flight of the Intruder

review by Douglas Hecht

If you enjoy reading about the history of the Air War in Vietnam, flying jet fighter bombers, (either the A6 Intruder or the F4 Phantom can be flown in this game) or just sitting down with your computer for a very challenging good time; I've got good news... This is your kind of game!

Spectrum's Flight Of The Intruder ($59.95 for CGA-VGA 640K PC) brings together a lot of the history of the Air War in Vietnam right off of the carrier flight decks, and wraps it all up in a software package that brings the user realistic graphics and AdLib/SB sound. The dogfights are tough, but, your radar, your wingman and your visuals will assist you and the targets and carriers are pretty vivid when you get close to them. The game even goes into the detail of having the F4's radar pick up ground clutter when it goes into a dive, just like the real thing.

The games "Personnel and Communications Manual" has easy to understand instructions for playing. It contains descriptions of all of the missions— ten for the Intruder and 11 for the Phantom. It even contains a question and answer section with the answers to questions commonly asked. The manual also takes you by the hand and puts you into both cockpits for your first missions. In addition it includes stories told by some of the men who flew the actual missions during the war; and, I suppose they have done 'Pre Flight Checks' of the simulator, although there is nothing to confirm that.

Once you have read all the stories in the manual and read the book— Flight Of The Intruder by Stephen Coonts is included with the software— you may be ready to become the "CAG" ("Commander Of the Air Group") and design your own missions! To help, the package comes with a copy of the original map used by the pilots during the war.

The simulation can also be played by two players via modem or comm link. The game is set up so that the player with the faster of the two machines should be the "U.S. Host", the other player's machine becomes a terminal. Flight of the Intruder IS really a very good time to be had, whether it's shared with others or played by one!

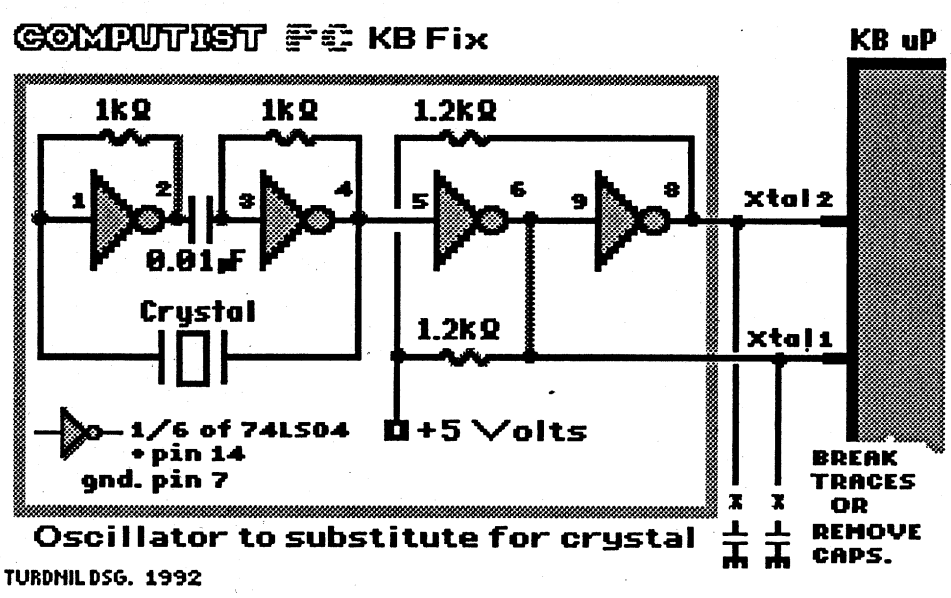
Fast Frames, Updates, etc.

PG's and R's

A game rating addendum like "PG-13" or "R" has roughly the same meaning as when applied to motion pictures. Most often it means that the game presents "compromising", "risky", etc. situations or behaviors which some players, especially younger ones, might mistake as "usual" or "okay".

PC Keyboard Fix

Today's keyboards are so rugged that, when one malfunctions, it is often the last component tested: "It can't be the keyboard!" Alas, it can. One especially insidious gremlin likes to make sporadic surprise appearances. Keys, inexplicably, fail to function, then, with luck, work again. If luck is running a tad low, you may find yourself RESET-ing your way out of a bombed game or trashed programming session. The phenomenon is surprisingly pervasive. More surprising still, it stems from a circuit design flaw which seems to have infected keyboard makers like some kind of virus.



Most PC keyboards are built around one of the "single component microcomputer" chips. Regrettably, too many designers take this designation seriously; they believe in the IC's built-in clock circuitry, even pushing it to near or beyond the rated frequency limit. They should know better. In-uP clocks are

notoriously unreliable. Especially near max speed, they tend to stop!

When the gremlin appeared on our PC, I, naturally, suspected the interface, the firmware, the power supply, the KB plug, the KB cable, ... and, finally, the KB circuit. Sure enough, the KB's clock— a crystal plus a couple capacitors connected to the microprocessor's "Xtal" pins— was subject to fits of non-oscillation. Adding a separate oscillator circuit fixed the problem.

If a glitchy clock plagues your keyboard, the Computist PC KB Fix should set things right. Check to be sure that your KB employs the usual internal clock approach; then, track down the uP's "Xtal" leads and follow the schematic. (Note: If you do any soldering to crystal leads be sure to use a heatsink.) The components are inexpensive and values are not especially critical. In just two or three hours you or a hardware-wise friend can have the job done and send that pesky clock gremlin packing!

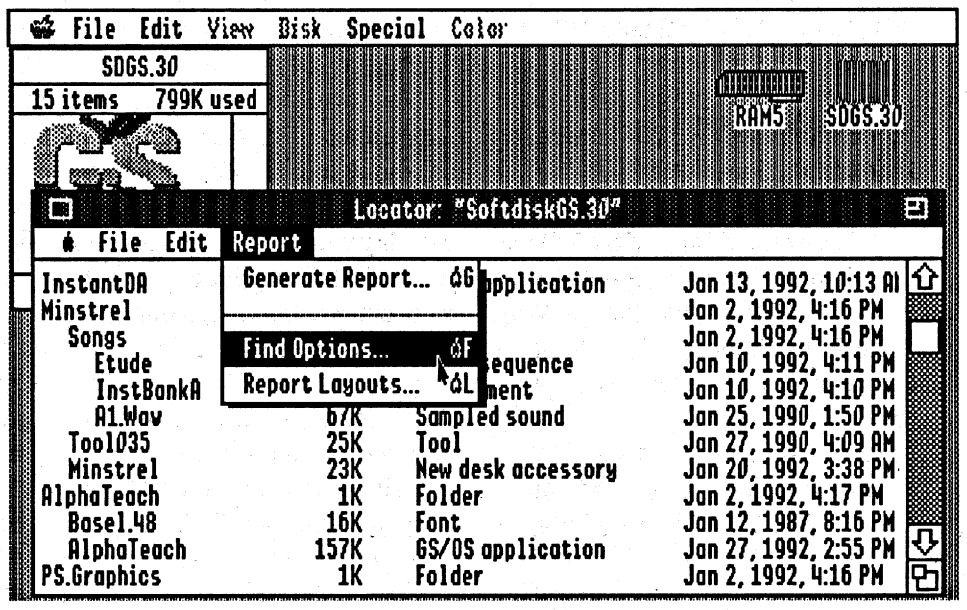
Murder! ☹

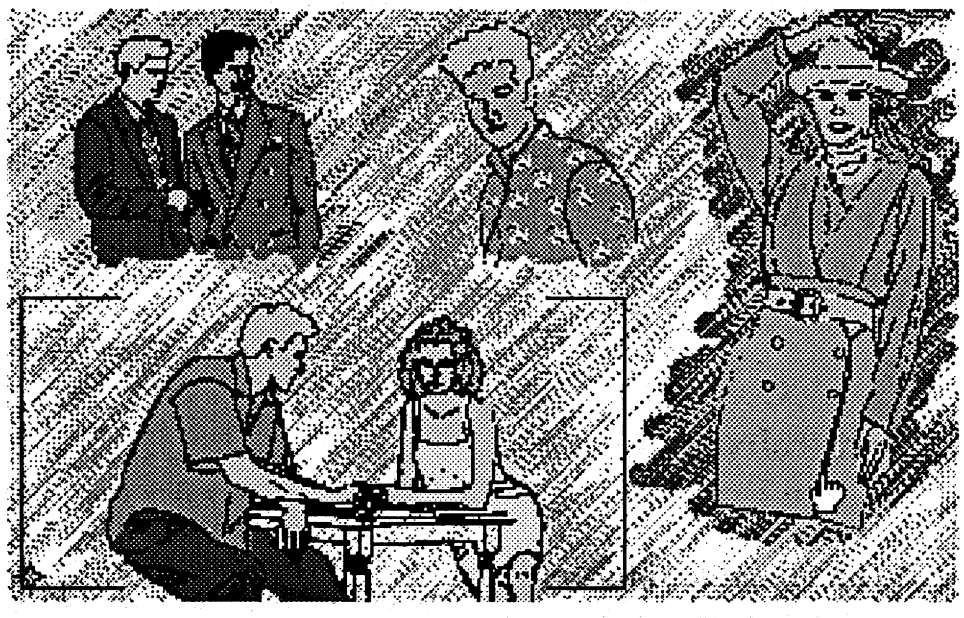
As devotees of dastardly deed detection know all too well, it has been a long time since a first rate piece of crime-cracker software hit the scene. After trying (and trying, and ...) U.S. Gold's Murder! ($44.95 for 640K EGA-VGA PC), I am forced to conclude that mavens of mayhem will have to wait a while longer. Murder! starts with a clever idea: let the player-detective move around in a large mansion, find objects, take fingerprints, and question suspects to solve a murder. Juggling several different floor plans, fifteen or so personalities, and nearly forty items, you have a practically endless supply of 'Who? How? Why?' cases to crack!

The problem is execution. For the record: relying upon just "PC sound" and the absence of a Save Game option are weaknesses not likely to put off enthusiastic veterans of low-frill classics like "Murder by the Dozen". Frill-wise, mystery game designers can 'get away with murder'! However, if the graphics are so crude that you cannot visually distinguish one suspect from another; and, suspect questioning is grossly cumbersome; and, 80-90% of what you get is 'Who saw whom where at what time' ... if, in fact, the chase proves to be dreadfully boring, THEN, it's best to pack in the old magnifying glass and wait.

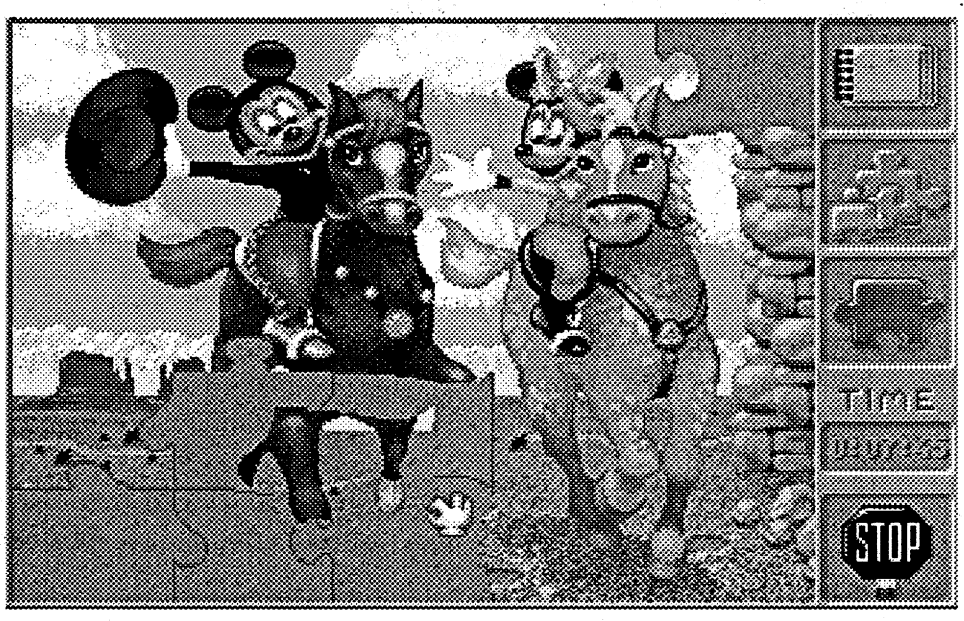
Mickey's Jigsaw Puzzles
★★★★

Yet another "ages 5 & up" wonder from Disney, 'Jigsaw Puzzles is a nice developer for 'visual discrimination'; but, mainly, it's for fun. Your puzzle box includes fifteen full-color VGA pictures featuring Mickey, Minnie, and other Disney characters doing all sorts of fun things. Like, how about playing in a tree house, doing a magic show, exploring a haunted castle, skin diving, or lunching on the moon?! Any of the pictures can be dumped to a parallel printer in B&W outline form for coloring. Best of all, when you finish a puzzle, it 'comes alive' in a smoothly animated sequence backed by rich sound effects and voices via Sound Blaster or Sound Source!!





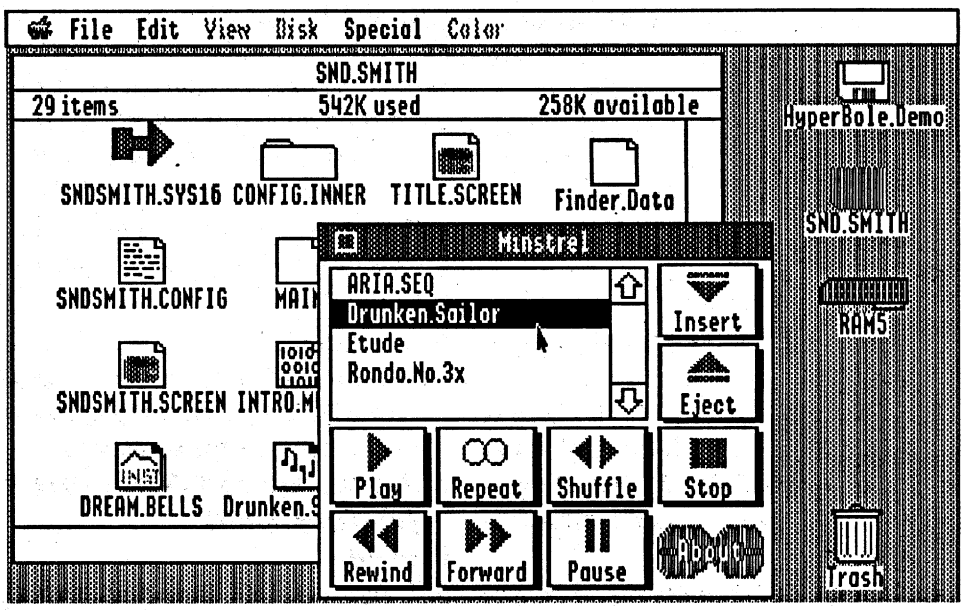
It's up to an adult to get through the rather cumbersome graphics/sound/printer setup process. Happily, from then on, the game starts up with clickable big-icon buttons ready to pick a picture and set number of pieces— you have seven choices ranging from 4 through 64. Other major options let you choose jigsaw or square pieces and toggle on-screen piece outlines On or Off. Thanks to natural-feeling click-and-drag controls and computer-aided fitting of 'close enough' placements, putting the puzzle together could hardly be more like 'the real thing'. Older users, especially, will appreciate the challenge of 'no lines' play and such conveniences as being able to move pieces as a group. Supplied with colorful manual plus a cute jigsaw puzzle, Mickey's Jigsaw Puzzles is durable entertainment and a nice showpiece for your system. ($49.95, $69.95 with Sound Source hardware, for CGA-VGA 640K PC on 5.25" and 3.5" media)



IIgs Resources

Stacks of Art

One of the ways you can tell when a medium has really 'taken off' is its utilization in avant-garde publications. If the on-disk arts magazine, Hyperbole, is any indication, HyperStudio stacks are IN, along with MIDI-synth music as produced via utilities like Huibert Aalbers's "Sound Smith". (Note: Hyperbole supplies the current runtime version of "HyperStudio 3.0" and the MIDI-synth Tool on their diskettes. Extra MIDI hardware is not required to play the songs.)



Each bi-monthly two-diskette (1.6M) issue includes reviews, a Hyper-ed version of some literary classic, "New Boundaries" commentary from the editor, and "Four Corners", a Who-What-Where-When 'seed' scenario which readers are encouraged to expand into a story for publication. Plus, you will find 'stacks' of poetry, graphics collages, short stories, assorted vignettes, ... almost always supported by melodies, voices, and/or sound effects. (All of which, to be sure, positively gobbles memory. Figure on at least 2 MB to be fairly safe from lo-RAM bomb-outs.) Expect a few rough edges: Hyperbole is just getting into its second year. Mainly, expect to be pleased, annoyed, provoked, outraged, and enchanted. (Hyperbole: $42/yr. for IIgs; subscribe at Resource Central address. For "Sound Smith" docs and shareware use rights send $20 bill to H. Aalbers.)

Neato NDA's

Besides games, educational programs, new fonts, and "Print Shop" clip art, an ongoing project at Softdisk-GS is the unlimited expansion of your NDA collection. (A New Desk Accessory is an in-RAM program similar to the Control Panel which you can start from the GSOS Apple-symbol menu.) Issue #30 adds two NDA's which seem certain to become favorites.

Minstrel is a pop-up player for MIDI-synth music featuring clickable CD-style controls. With it you can not only play "Sound Smith" creations, pieces from Hyperbole, and the Chopin etude included on the SDGS diskette; you can play them in the background while executing some other program! Options include single-play, continuous play, and random play of all the pieces "inserted" into the 'machine'.

With Locator you need never again 'lose' a file amongst a maze of folders. It will search an entire disk or folder using inclusive or exclusive name matching, file type, and size criteria. Locator can also supply a 'tree' or non-tree listing which you can display, print, and/or save to disk. For compactness, you can exclude file type and date info; and, the listing can be tailored to include or exclude files according to name, type, and size.

Each of the new NDA's is fairly hefty. The Softdisk' people know some users will not want to install them every time they start GSOS; so, SDGS #30 includes an updated version of its famous "InstantDA" utility. With "InstantDA" in your SYSTEM folder, you can install Minstrel or Locator after startup by clicking the desired NDA's custom icon. (The icons are included.) Even better, "InstantDA" can work for other NDA's. Using an icon creator/editor, such as Paul Elseth's "IconEd" ($15, shareware), you just create an icon for the NDA and make sure that it specifies *:SYSTEM:INSTANTDA as the Application Path. Clicking the icon passes the NDA's name to "InstantDA" which then pastes the NDA into RAM for 'the duration'. Pretty neat! (Softdisk-GS: $89.95/yr for current GSOS system disk plus 12 monthly 800K issues)

Font Fever

When sending off Narf.8 to the Fonts Clearinghouse, my cover letter included a question about some kind of master II/IIgs Font Collection. I have not heard from the 'Clearinghouse yet; but, the newly arrived flyer from Nite Owl Productions just happens to supply the answer. Nite Owl is offering eight 3.5" diskettes crammed with "hundreds of IIgs fonts" compiled by the Resource Central staff. 'Actual size' is 8 MB since the IIgs Font Collection employs file packing. For $39 (plus $2 S/H from Nite Owl) you get the fonts, the unpacker program, an Appleworks data file listing the fonts included, picture files for viewing the fonts, and yet another good excuse for investing in a hard disk.

Next

Look for Nite Owl's Wraith, AE's GS RAM III, and a build-it-yourself Turdnil Labs IIgs Stereo Board design. Maybe, too, there will be ... more!

Vendors

Huibert Aalbers: Travesia Andres Mellado 3, 28015 Madrid, Spain ref. Sound Smith

ACCOLADE: 550 S. Winchester Blvd., Suite 200, San Jose, CA 95128 atten: Melinda Mongelluzzo (408-985-1700; orders: 800-245-7744)

ADDISON-WESLEY PUBLISHING: Route 128, Reading, MA 01867 atten: Abigail Genuth (617-944-3700)

AD LIB: 220 Grand-Allee East, Suite 960, Quebec, QC, Canada G1R 2J1 atten: Jill Carette (800-463-2686)

APPLE COMPUTER: 20525 Mariani Avenue, Cupertino, CA 95014 atten: Keri Walker, mailstop 48-I/408-974-2042

APPLE II FONT CLEARINGHOUSE: 4020 South Alabama, St. Francis, WI 53235 atten: Mark Collins (414-481-2766; Applnk: AFC Mark; CIS: 76324,564)

BEAGLE BROS.: 6215 Ferris Square, Suite 100, San Diego, CA 92121 atten: Bevey Minarovich (800-345-1750)

BROWN & WAGH: 130D Knowles Drive, Los Gatos, CA 95030 atten: LouAnn Meir (800-451-0900) ref. Creative Labs/Sound Blaster

BYTE WORKS: 4700 Irving Blvd. NW, Suite 207, Albuquerque, NM 87114 atten. Patty Westerfield (505-898-8183)

DOMARK: 550 S. Winchester Blvd., San Jose, CA 95128 atten: Caryn Mical (408-246-6607; orders: 800-245-7744) dist: Accolade

ELECTRONIC ARTS: 1450 Fashion Island Blvd., San Mateo, CA 94404 atten: Marci Galea & Lisa Higgins (415-571-7171/ orders: 800-245-4525)

Paul Elseth: 2739 Fairview Ct. SE, Rochester, MN 55901 (CIS: 76067,1155; BIX: pelseth) ref. IconEd 1988

Douglas Hecht: 14724D Perthshire Road, Houston, TX 77079

HYPERBOLE: 2402 Yoakum #2, Houston, TX 77006 atten: Greg Roach, Ed. (for editorial submissions; subscribe at RC)

JANKLOW BENDER: 257 Park Avenue South, New York, NY 10010 atten: Kim Adamo & Susan Kornick (212-475-8030) ref. Disney

NITE OWL PRODUCTIONS: 5734 Lamar Avenue, Mission, KS 66202-2646 atten: Bob Shofstall (913-362-9898)

PRODUCT MONITOR: 7814 Santa Elena, Houston, TX 77061 atten: Jeff Hurlburt (713-645-8680)

RESOURCE CENTRAL: P.O. Box 11250, Overland Park, KS 66207 atten: Tom Weishaar (913-469-6502)

ROGER WAGNER: 1050 Pioneer Way, Suite P, El Cajon, CA 92020 atten: Garland Buckingham (619-442-0522)

SOFTDISK-GS: P.O. Box 30008, Shreveport, LA 71130-0008 atten: Lee Golden, Ed. (800-831-2694)

SPECTRUM-HOLOBYTE: 2061 Challenger Dr., Alameda, CA 94501 atten: Liz Rich (415-522-0107)

STRATEGIC SIMULATIONS INC.: 675 Almandor Ave, Sunnyvale, CA 94086 atten: Kathleen Watson (408-737-6800) dist: Electronic Arts

U.S. GOLD: 550 S. Winchester Blvd., San Jose, CA 95128 atten: Caryn Mical (408-246-6607) dist: Accolade

WALT DISNEY COMPUTER SOFTWARE: 500 South Buena Vista, Burbank, CA 91521 atten: Kirk Green (800-688-1520 orders, 818-567-5360) ref: Janklow-Bender

ZIP TECHNOLOGY: 5601 Slauson Ave. #264, Culver City, CA 90230 atten: PR/Mktg. (800-937-9737)

Tim Phelps CA

Convert DOS Infocom Games to ProDOS

The Portable Infocom

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InfocomPro is freeware, not shareware or public domain. InfocomPro—consisting of the files "README", "INFOSNARF", and "INFOLOAD"—may be freely distributed, but only as an unmodified group of three, and only as long as no more than $5 is charged to obtain a copy, inclusive of media, postage, and handling. In particular, the Public Domain Exchange (aka PDE) may not charge its outrageous $9 for any disk containing InfocomPro. Seeing as how InfocomPro is free, the author makes no promises at trying to help you with your problems. If you have a suggestion or find a bug, you are welcome to report it.

Requirements:

Apple II with 65C02 or better to capture games. Any Apple II will play games, but 80 columns recommended

An Infocom game with Version B interpreter (see below)

Optional:

3.5" disk drive or hard disk strongly recommended

Perhaps you've seen The Portable Kafka or The Portable Beat Reader—now you can have portable interactive fiction for your Apple II. All of the early Infocom text games were written in a high-level adventure description language and compiled into a low-level machine-independent code. To run any game on a particular machine, all Infocom had to do was write an interpreter on that machine for the code produced by their compiler; that's why their games ran on so many platforms: they wrote the interpreter once per machine, and it worked for all their games.

Now with the two programs included with InfocomPro, you can convert most of your Apple II Infocom text games to run under ProDOS. Alternatively, you can play your Apple II games on another (e.g., UNIX) machine if you have an Infocom interpreter for that computer.

Games in progress are saved as a normal ProDOS file, so you can keep them (conveniently date and time stamped) on the same disk as the program itself and move them about conveniently—no more dedicating an entire 5.25" disk to Infocom saved games! Further, you can put several (usually about six) games on a 3.5" disk or your entire collection on hard disk. Most importantly, you can play (most of) the games recently re-released as the Lost Treasures of Infocom, a set of 20 early adventures for $60. Unfortunately, it is now available only for IBM and Macintosh computers; fortunately—assuming you can transfer the data files over to Apple II (and don't ask me how to do this!)—you can play these games on your Apple II, as the game files themselves are machine-independent.

Here's how.

First you need to get an interpreter. An interpreter from most games will run the game code of most other disks. Unfortunately, the many versions of the interpreter make it difficult to write one set of code that works with all. Therefore, I require you to use Interpreter version B, which works on all Apples and gives you the ability to view all compatible games in 80 column upper and lower case—even ones which originally played only in 40 column all uppercase! To determine which Infocom game of yours has this interpreter, boot the disk and type:

$verify *as a command*

If the interpreter is version B, it will say "INTERPRETER : B".

Once you've located a game disk with Interpreter B, boot it, and when the game asks "80 COLUMNS (Y/N)?", press reset. Move 800.8FF temporarily with *4000<800.8FFM (the asterisk indicates that this command should be typed from the monitor), boot a DOS 3.3 disk without a hello program, restore 800.8FF with *800<4000.40FFM, and save the interpreter to disk with "BSAVE INTERPRETER,A$800,L$1BE6". Then use Copy][Plus to copy it over to a ProDOS disk.

Now to copy the code for each game into a ProDOS file follow these steps.

1. Unprotect the game, if it's not already so. If your game is copy protected, refer to the addendum for hints on deprotecting it.

2. Now to capture the game code into a ProDOS file, run InfoSnarf and follow its instructions (for a little entertainment during the transfer, press lowercase "g"). Note that the game name it requests is the ProDOS pathname under which the data is saved, so the filename portion is limited to a maximum of 15 letters. InfoSnarf checks to make sure the game code was compiled with the compiler supported by Interpreter B. Thus very early games (like my copies of Zork I and II) and later games (like graphic adventures) will not be converted.

3. To run a captured game from within ProDOS, use your program selector to run InfoLoad with the game name (as given in step 2) as the startup file. If no startup file is provided, InfoLoad will ask for one. InfoLoad will load the interpreter, patch it to work with ProDOS, and run the game code.

A complete, bootable ProDOS game disk includes the following files: ProDOS, INTERPRETER, InfoLoad, and one or more game files. With these three files, some (most?) games are now to big to fit on a 5.25" disk! In this case you need to boot ProDOS from another disk, then type in the pathname of the game file on the other disk to run it. ProDOS, INTERPRETER and InfoLoad need be included only once for all games on the disks.

Note: I plan to buy the Macintosh version of Lost Treasures and wrote InfocomPro so that I could run the games on my Apple IIgs. This had several implications in development, specifically: I don't care that my Zork I and II aren't compatible as I'll use the LT versions; InfoSnarf needs a 65C02 or higher (though InfoLoad works on all IIs); and a version B interpreter is required.

Thanks to: Andy McFadden, Joe Kohn.

Addendum

This addendum is included as a last-hope set of hints for deprotecting your Infocom text games.

Zork (issue #1)

Witness (issue #4)

```
RUN COPYA
ctrl-C
70                          deletes line #70
CALL -151
B925:18 60
B988:18 60
BE48:18
B8FB:29 00
3D0G
RUN
```

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

Starcross (issue #5)

The data prolog bytes were changed from D5 AA AD to D5 AA BC.

Trk	Sct	Byte	From	To
$00	$02	$FC	BC	AD
		$5D	BC	AD

Issue #24 - Updated Infocom disks

```
RUN COPYA
70                          deletes line #70
365 POKE 49384,0            make the drive stop
   turning
CALL-151
B925:18 60
B988:18 60
BE48:18 60          <— this line changed
B8FB:29 00
3D0G
RUN
```

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

Issue #51 did the same for Sorcerer and Zork III.

Issue #63 did it again for Deadline, Enchanter, Sorcerer, Starcross, Zork II.

One issue reported that "Nord & Bert Couldn't Make Heads or Tails of it" was stored in 18-sector format. Bummer.

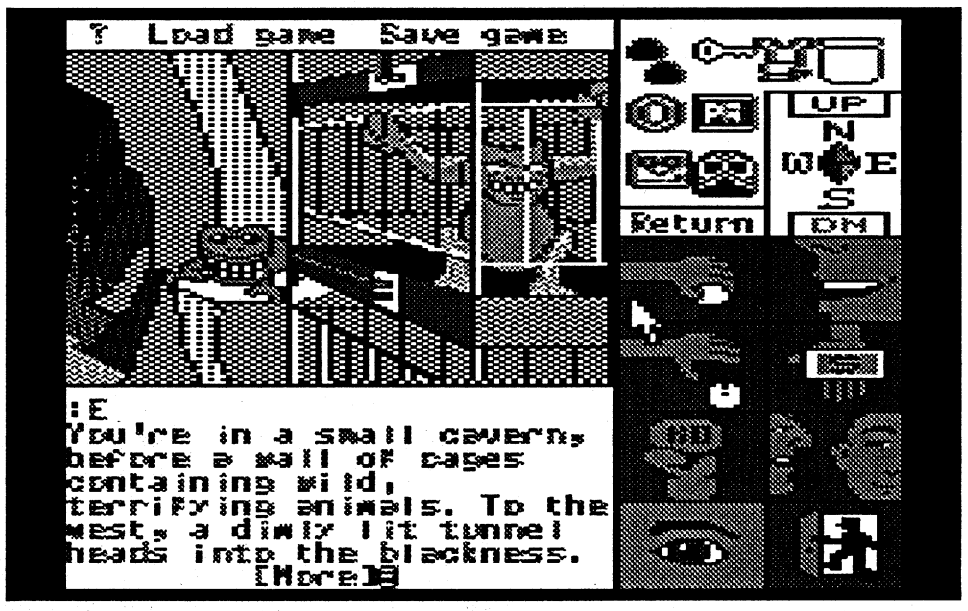
Save INFOSNARF as a binary (BIN) file and INFOLOAD as a system (SYS) file.....RDEXed

INFOSNARF (L$1029)

```
0800:20 2F FB 20 58 FC 20 95 $479E
0808:0B C9 EE E6 EF D3 EE E1 $A6C4
0810:F2 E6 A0 F6 B1 AE B0 8D $1438
0818:E2 F9 A0 D4 AE C1 AE A0 $35C0
0820:D0 E8 E5 EC F0 F3 8D 8D $159F
0828:8D 00 A9 04 85 22 20 4A $212C
0830:0B 20 00 BF C7 EE 0B AD $7E9D
0838:F5 0B D0 22 AD 30 BF 8D $75CA
0840:F2 0B 20 00 BF C5 F1 0B $521C
0848:AD F6 0B 29 0F F0 6E 1A $9CF3
0850:8D F5 0B A9 2F 8D F6 0B $3BCB
0858:20 00 BF C6 EE 0B 20 B4 $227E
0860:0A B0 5A 20 EA 08 B0 50 $B3C8
0868:20 00 BF C1 CF 0B A9 C3 $A08D
0870:85 FE 20 00 BF C0 D2 0B $CFE9
0878:B0 4A A9 CF 85 FE 20 00 $E084
0880:BF C8 DE 0B B0 3E AD E3 $4039
0888:0B 8D E5 0B 8D ED 0B 8D $5690
0890:51 C0 AD 00 C0 C9 E7 D0 $A2A1
0898:03 8D 50 C0 20 33 0A 20 $C6F1
08A0:63 0A 90 EB 20 00 BF CC $ED55
08A8:EC 0B 8D 51 C0 20 BA 09 $3B45
08B0:90 06 20 00 BF C1 CF 0B $BFD3
08B8:20 F8 09 90 A1 A9 00 85 $D1AB
08C0:22 4C D0 03 4C C7 08 48 $0021
08C8:20 95 0B 8D D0 F2 EF C4 $42E0
08D0:CF D3 A0 E5 F2 F2 EF F2 $1B5B
08D8:A0 A3 00 68 20 DA FD A5 $9BDA
08E0:FE 20 ED FD 68 68 4C 59 $DA99
08E8:FF 60 A9 00 8D CB 0B A9 $220C
08F0:24 8D CC 0B A9 18 8D CD $E57F
08F8:0B A9 00 8D CE 0B 20 00 $1E15
0900:BF 80 C9 0B B0 5E AD 00 $647E
0908:24 C9 03 D0 7D AD 1C 24 $ED90
0910:85 FD AD 1D 24 85 FC A2 $58AF
0918:3F 18 A5 FC 7D 00 24 85 $EA86
0920:FC 90 02 E6 FD CA 10 F1 $9C6F
0928:AD 1A 24 85 FA AD 1B 24 $FA78
0930:85 F9 A9 00 85 FB 06 F9 $A6EE
0938:26 FA 26 FB 20 95 0B CC $5379
0940:E5 EE E7 F4 E8 BA A0 00 $F837
0948:A5 FB 20 DA FD A5 FA 20 $6337
0950:DA FD A5 F9 20 DA FD 20 $9EBA
0958:95 0B A0 E2 F9 F4 E5 F3 $8812
0960:8D 00 18 60 20 95 0B C4 $5002
0968:E9 F3 EB A0 ED F5 F3 F4 $AA9B
0970:A0 E2 E5 A0 F5 EE F0 F2 $629C
0978:EF F4 E5 E3 F4 E5 E4 A0 $1F17
0980:E6 E9 F2 F3 F4 A1 8D 00 $F829
0988:38 60 48 20 95 0B C2 E1 $83A5
0990:E4 A0 F6 E5 F2 F3 E9 EF $12A8
0998:EE A0 EE F5 ED E2 E5 F2 $1750
09A0:BA A0 00 68 20 DA FD 20 $1E10
09A8:95 0B A8 ED F5 F3 F4 A0 $AD76
09B0:E2 E5 A0 B0 B3 A9 8D 00 $F138
09B8:38 60 20 95 0B C3 E8 E5 $A9B2
09C0:E3 EB F3 F5 ED A0 00 A5 $C00E
09C8:FC 05 FD D0 0C 20 95 0B $F67F
09D0:F6 E1 EC E9 E4 8D 00 18 $909D
09D8:60 20 95 0B E9 EE F6 E1 $F51D
09E0:EC E9 E4 AD AD E7 E1 ED $AD46
09E8:E5 A0 E3 EF F2 F2 F5 F0 $D2FB
09F0:F4 E5 E4 A1 8D 00 38 60 $A4FA
09F8:20 95 0B 8D 8D C1 E7 E1 $A45B
0A00:E9 EE BF A0 A8 F9 AF EE $FB10
0A08:A9 A0 F9 88 00 8D 10 C0 $54C4
0A10:20 0C FD C9 8D F0 0D 29 $A643
0A18:DF C9 D9 F0 07 C9 CE D0 $0F7C
0A20:EF 38 80 02 18 60 08 A9 $DB68
0A28:00 85 24 8D 7B 05 20 9C $D971
0A30:FC 28 60 A9 D2 85 FE A9 $F873
0A38:00 8D CB 0B A9 24 8D CC $0D25
0A40:0B A9 08 85 FF 20 00 BF $084A
0A48:80 C9 0B B0 13 EE CC 0B $E644
0A50:EE CC 0B EE CD 0B D0 03 $8891
0A58:EE CE 0B C6 FF D0 E6 60 $BA15
0A60:4C C7 08 A9 D7 85 FE A9 $34CF
0A68:00 8D E8 0B A9 01 8D E9 $D204
0A70:0B A0 00 18 B9 B9 0B 69 $04CD
0A78:24 8D E7 0B A2 00 A5 FB $DF53
0A80:05 FA D0 0B 8D E9 0B A5 $BFCC
0A88:F9 F0 24 8D E8 0B AA 20 $B07E
0A90:31 0B 20 00 BF CB E4 0B $2EB7
0A98:B0 17 A5 FB 05 FA F0 0F $0595
0AA0:A5 FA D0 02 C6 FB C6 FA $8A54
0AA8:C8 C0 10 90 C6 18 60 38 $E1D4
0AB0:60 4C C7 08 20 95 0B C9 $67BA
0AB8:EE F3 E5 F2 F4 A0 F5 EE $2FEF
0AC0:F0 F2 EF F4 E5 E3 F4 E5 $DE7B
0AC8:E4 A0 C9 EE E6 EF E3 EF $8E78
0AD0:ED A0 E7 E1 ED E5 A0 E4 $0B0D
0AD8:E9 F3 EB 8D 00 20 95 0B $6B6E
0AE0:E9 EE A0 F3 EC EF F4 A0 $F900
0AE8:B6 AC A0 E4 F2 E9 F6 E5 $2C66
0AF0:A0 B1 AE 8D 8D 00 20 95 $A05B
0AF8:0B D0 E1 F4 E8 EE E1 ED $5049
0B00:E5 A0 EF E6 A0 F3 E1 F6 $7889
0B08:E5 A0 E6 E9 EC E5 BF 8D $23C3
0B10:BE 00 A9 3E 85 33 20 6F $44E0
0B18:FD E0 00 F0 12 DA BD FF $648A
0B20:01 29 7F 9D 00 02 CA D0 $B83F
0B28:F5 FA 8E 00 02 18 60 38 $A895
0B30:60 AD E7 0B 8D 3D 0B CA $CDF4
0B38:38 A5 FC FD 00 24 85 FC $C317
0B40:B0 02 C6 FD CA E0 FF D0 $21B1
0B48:EF 60 8D 51 C0 8D 52 C0 $EFB7
0B50:8D 57 C0 A9 20 8D 5E 0B $08A4
0B58:A0 20 A2 00 9E 00 20 CA $C04B
0B60:D0 FA EE 5E 0B 88 D0 F4 $0468
0B68:A0 06 B9 80 0B 99 F1 37 $2BCF
0B70:B9 87 0B 99 F1 3B B9 8E $71E4
0B78:0B 99 F1 3F 88 10 EB 60 $63F6
0B80:18 33 60 73 61 71 79 78 $7242
0B88:33 60 4C 19 33 66 18 33 $A248
0B90:60 40 71 30 60 68 85 40 $C0B4
0B98:68 85 41 E6 40 D0 02 E6 $6257
0BA0:41 B2 40 F0 0D C9 28 B0 $15D4
0BA8:04 85 24 80 EE 20 ED FD $CE8B
0BB0:80 E9 A5 41 48 A5 40 48 $33E8
0BB8:60 00 02 04 06 08 0A 0C $E4E0
0BC0:0E 01 03 05 07 09 0B 0D $6C51
0BC8:0F 03 60 00 24 00 00 01 $8153
0BD0:00 02 07 00 02 C3 06 00 $17E8
0BD8:00 01 00 00 00 00 03 00 $F1C9
0BE0:02 00 20 00 04 00 00 24 $6E3B
0BE8:00 01 00 00 01 00 01 F5 $2017
0BF0:0B 02 00 F6 0B 00 00 00 $6A2D
0BF8:00 00 00 00 00 00 00 00 $CABD
0C00:00 00 00 00 00 $4D2A
```

INFOLOAD (L$714)

```
0800:4C 47 20 EE EE 40 00 C3 $11FB
0808:EF F0 F9 F2 E9 E7 E8 F4 $EBC8
0810:A0 A8 E3 A9 A0 B1 B9 B9 $B718
0818:B2 A0 A0 D4 AE C1 AE A0 $9FAE
0820:D0 E8 E5 EC F0 F3 8D C1 $D3B7
0828:EC EC A0 F2 E9 E7 E8 F4 $9636
0830:F3 A0 F2 E5 F3 E5 F2 F6 $BCEB
0838:E5 E4 AE 8D 8D 00 00 00 $2655
0840:00 00 00 00 00 00 00 A2 $E414
0848:03 A0 00 B9 C7 20 99 00 $71E5
0850:24 C8 D0 F7 EE 4D 20 EE $28FD
0858:50 20 CA D0 EE 20 00 BF $C1E8
0860:C7 EB 25 AD F2 25 D0 22 $C838
0868:AD 30 BF 8D EF 25 20 00 $7CC9
0870:BF C5 EE 25 AD F3 25 29 $EE4F
0878:0F 18 69 01 8D F2 25 A9 $754E
0880:2F 8D F3 25 20 00 BF C6 $5E12
0888:EB 25 20 2F FB 20 58 FC $F07B
0890:20 50 25 C9 EE E6 EF CC $8BE0
0898:EF E1 E4 A0 F6 B1 AE B0 $C643
08A0:8D 8D 00 AD 06 20 D0 1C $C396
08A8:20 50 25 C7 E1 ED E5 BA $0F69
08B0:A0 00 20 6F FD 8A 48 BD $2B38
08B8:FF 01 9D 06 20 CA D0 F7 $E867
08C0:68 8D 06 20 4C 00 24 20 $BA61
08C8:00 BF C8 A4 25 AD A9 25 $EF2C
08D0:8D B3 25 8D AB 25 8D B8 $C9F5
08D8:25 20 00 BF C8 D4 25 AD $F16E
08E0:D9 25 8D DB 25 8D EA 25 $F426
08E8:20 00 BF CA DA 25 20 00 $4F3C
08F0:BF CC E9 25 A9 03 8D D5 $3F61
08F8:25 A9 26 8D D6 25 A9 00 $B20F
0900:8D DE 25 A9 01 8D DF 25 $5098
0908:AD AC 0C C9 42 F0 02 D0 $7D75
0910:2A A2 00 F0 00 BD 78 25 $0432
0918:85 FE E8 BD 78 25 85 FF $D568
0920:F0 16 E8 BD 78 25 85 FD $CCF6
0928:E8 A0 00 BD 78 25 91 FE $5CDE
0930:E8 C8 C6 FD D0 F5 F0 DD $CA1C
0938:4C 00 08 20 50 25 C9 EE $CDA2
0940:F4 E5 F2 F0 F2 E5 F4 E5 $E04E
0948:F2 A0 EE EF F4 A0 F3 F5 $4D6A
0950:F0 F0 EF F2 F4 E5 E4 A0 $AFF8
0958:00 8D 10 C0 20 0C FD 20 $42FF
0960:00 BF 65 E2 25 4C 59 FF $E21B
0968:A5 E4 8D B5 25 A5 E5 8D $0705
0970:B6 25 20 00 BF CE B2 25 $A603
0978:B0 13 20 00 BF CA AA 25 $089C
0980:B0 0B A0 00 B9 00 27 91 $F941
0988:E6 C8 D0 F8 60 85 00 4C $1347
0990:59 FF 20 00 BF CC B7 25 $35CD
0998:B0 F3 20 00 BF 65 E2 25 $6283
09A0:B0 EB 20 50 25 D3 E1 F6 $70DC
09A8:E5 A0 E6 E9 EC E5 BA A0 $0E95
09B0:00 20 6F FD 8E 03 26 CA $D11C
09B8:BD 00 02 29 7F 9D 04 26 $B1BD
09C0:CA 10 F5 A9 00 8D 02 26 $4705
09C8:18 60 AD 02 26 D0 0E 20 $1987
09D0:00 BF C1 C5 25 20 00 BF $0677
09D8:C0 C8 25 B0 32 A9 CB D0 $4D47
09E0:02 A9 CA 8D 45 25 AD 02 $687C
09E8:26 D0 14 20 00 BF C8 D4 $DC53
09F0:25 B0 1C AD D9 25 8D DB $BF4D
09F8:25 8D EA 25 EE 02 26 A5 $5179
0A00:E6 8D DC 25 A5 E7 8D DD $0288
0A08:25 20 00 BF CA DA 25 60 $2A76
0A10:20 00 BF CC E9 25 60 68 $BAEA
0A18:85 40 68 85 41 A0 00 E6 $9357
0A20:40 D0 02 E6 41 B1 40 F0 $2925
0A28:0F C9 28 B0 05 85 24 4C $DA2D
0A30:58 25 20 ED FD 4C 58 25 $09CA
0A38:A5 41 48 A5 40 48 60 F1 $EE6F
0A40:1E 03 4C A1 24 E3 23 03 $303D
0A48:4C CB 24 FA 08 03 A9 BA $AA14
0A50:EA 9B 20 03 4C DB 24 47 $B7FA
0A58:1F 03 4C 03 25 2B 1F 03 $75A1
0A60:4C 1A 25 DE 21 03 4C 49 $AF54
0A68:25 00 00 03 06 20 00 28 $0D84
0A70:00 04 00 00 27 00 01 00 $F87A
0A78:00 02 00 00 00 00 01 00 $FA0A
0A80:0B 49 4E 54 45 52 50 52 $8DD0
0A88:45 54 45 52 01 03 26 07 $9020
0A90:03 26 C3 06 00 00 01 00 $B6DB
0A98:00 00 00 03 B9 25 00 BB $2B56
0AA0:00 04 00 00 08 FF FF 00 $73CA
0AA8:00 04 00 00 00 00 00 00 $83C8
0AB0:01 00 01 F2 25 02 00 F3 $8A68
0AB8:25 00 00 00 00 00 00 00 $98B9
0AC0:00 00 00 00 00 00 00 00 $9869
0AC8:00 00 $AAD9
```



Rich Etarip WI

Bug in Airheart softkey

Some readers may experience a "VOLUME MISMATCH" error with the Airheart softkey (issue #85) depending on the DOS that was in memory when initializing the backup disk.

On page 20, column 3, after the second paragraph, it says "insert copy disk side 1". At this point insert:

B7EB:00

This will cause the RWTS to match any volume and prevent the error.

Bug in Minotaur softkey

In issue 84, page 20, column 2, about halfway down the page, step 7 says to "repeat steps 1-6". It should say to "repeat steps 2-6".

Softkey for...

Test Drive

Accolade

Requirements:
128K Apple IIe or IIc
COPYA from the master disk
2-sided blank disk
Sector editor

Test drive is a 1988 release from Accolade Software and has been on the Most Wanted List for quite sometime. Even though there have been several Accolade Softkeys published in Computist, none of them will work for this game. I've noticed about 4 other Accolade games on the Most Wanted List and this Softkey MIGHT work for them assuming they are protected the same way as Test Drive. At first glance, the disk appears to be quite simple to deprotect and it also appears to work when you boot up the copy. However, once the title sequence is completed, the disk begins to load and the computer hangs. In most cases, this means one thing. It's what we call secondary protection. It usually involves checking back to the disk to verify that it is the original. With just a bit of nosing around, I was able to find the disk check routine in memory at $7F00 but was unable to find it on the disk. I was not the least bit surprised to discover that the routine was encoded on the disk so it couldn't be easily found or changed. Without too much more trouble though, I was able to find it on track 06, sector 06.

The first step was to find the routine that decodes the disk check, call it to decode, and write the routine back to the disk in its readable form. This makes it easy to modify for 'trial and error'. The disk check routine looks at track $21 which seems a bit strange because track $21 is the only completely normal track on the disk. After further examination though, it appeared that track $21 was not so normal after all. Looking at track $22, the format is normal except for the information in the address field. Even though we are looking at track $22, the address field says it's track $21. Still confused, I opened up my disk drive so I could watch as it read track $21. Interestingly enough, the read/write head appeared to be stepping by quarter tracks between track $21 and $22. By examination of the disk check routine, it appeared that Accolade used a type of protection sometimes referred to as 'Track Imaging'.

So what is track imaging anyway?

To tell you the truth, all I know about this type of protection is what I've gathered from the information in Computist #21 in the article entitled 'Demystifying the Quarter Track'. I'm really not sure of the exact concept of track imaging but when a quarter track is written, images of the track are produced on the adjacent half track and full track. Track imaging involves checking the half-track for the unblemished image. Because Accolade's track $21 was most likely written with precision equipment, an Apple disk drive cannot make an exact bit for bit copy of this track and accurately preserve the track images. However, as much or as little as I may know about track imaging, at least I know that it's not foolproof.

In order to defeat a secondary protection scheme, you usually first have to know what it does. As the disk drive steps through the quarter tracks, it checks the sectors for length and stores checksums in a table. After this is finished, it jumps back to track $21 and reads the first 8 sectors into $4000. The reason the copy will not work is because the copied track $21, for some odd reason, refuses to read correctly into $4000. It had no problem reading track $21 from the original disk but it wouldn't read from the copy. I then noticed something suspicious about the way they read the address and data marks from the disk. A

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normal byte read looks like this example:

```
1000-    LDX #$60
1002-    LDA $C08C,X  ($C0EC)
1005-    BPL $1002
1007-    CMP #$D5
```

But, this is how Test Drive reads a byte from track $21:

```
1000-    LDX #$F0
1002-    LDA $BFFC,X  ($C0EC)
1005-    BPL $1002
1007-    SEC
1008-    SBC #$25
100A-    CMP #$B0
```

Due to the fact that timing is crucial in DOS, the extra two assembly instructions slow down the read procedure causing the load routine to sometimes read incorrectly. It's obvious that Test Drive's track $21 was written with a slightly slower drive speed where normal DOS can still read it but their disk check routine cannot correctly read a COPY of the track. Pretty clever, Accolade!!

Fortunately, the Test Drive DOS contains the normal DOS read routines that can be called from the disk check routine to correctly read the copied track $21. Also, the we'll put an RTS at the beginning of the disk stepper routine so it does not move to the quarter tracks. A few other modifications must be made so the program thinks it found the correct sector lengths as well.

The Cracking Procedure

Test Drive can be copied with COPYA but DOS must be modified to ignore epilog and checksum errors. Copy side 2 first.

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

After you have copied side 2, exit to basic and modify COPY.OBJ0 to skip track $22 of side 1. COPYA will not be able to read track $22 but it is just an image of track $21 for the soon to be defunct disk check routine.

```
POKE 770,24
POKE 863,24
70                          delete line 70
RUN
```

Now copy side 1 and then run your sector editor. For the machine language programmers who can identify opcodes, these edits will make no sense to you because they are in encoded form.

Trk	Sct	Byte	From	To
$06	$06	$A1-A3	AB DC 8F	A7 69 E7
		$A5-A6	F8 99	52 E2
		$C9-CB	AB DC 8F	A7 69 E7
		$CD-CE	43 98	CA E3
		$F9	4D	65
$06	$08	$EB	35	15
		$F2	F6	09
		$FA	39	09
$06	$09	$15	2D	0D

And that should produce a working, COPYAble Test Drive!! I have not had access to any other Accolade releases but it may not hurt to try this Softkey on any of the other Accolade disks on the Most Wanted List. Because this secondary protection was so extensive, they may have repeated it on other disks and this softkey just may work!

Softkey for...

Epoch

Sirius

It's time once again, to remove another title from Computist's Most Wanted List. This time it's Epoch. A Sirius game with typical Sirius protection. Epoch is a single load file but uses so much memory that it would more work than it's worth to try to scrunch it down into a BRUNable file. In cases such as this, I prefer to just write the game code directly to the disk and have it load in at boot just as the original does.

Begin by clearing the Applesoft program pointers in memory and entering the monitor.

```
FP
CALL-151
```

At $B700, enter a JMP $FF59 which will cause a jump to the monitor when booting the disk. I'll explain the reason for this further on.

```
B700:4C 59 FF
```

Initialize the disk and then delete the filename.

```
INIT HELLO
DELETE HELLO
```

Insert the Epoch disk. As usual, we will have to boot code trace the disk to get the program. As tedious and frustrating as boot code tracing is, it is still the most effective way to capture protected programs in memory. This disk contains almost the exact same boot code as Gorgon so I will skip the boot code tracing documentation this time. For a better explanation of this boot code (my best attempt at least) see the Gorgon Softkey in Issue #82.

Here is a cookbook method for the boot code trace:

```
CALL -151
9600<C600.C6FFM
96FA:98 N 9801:4C 59 FF
9600G
9800<800.8FFM
9810:64 N 984C:68
985C:01
9870:98
987E:59 FF
9600G
C0E8
9810:04 N 984C:08
8400<6400.67FFM
6463:84
6466:85
6469:86
646C:87
```

There is a memory check routine right before the boot code jumps to the game. Disable the conditional branch with two NOPs.

```
6519:EA EA
```

At $6538 ($538) is an RTS which is the exit to the start of the game. This normally goes to $7143 which appears to be 'garbage' memory but it is really scrambled assembly code. This technique is mentioned in the Softkey for O'Riley's Mine in Computist #82. Beyond the invalid opcodes is a JMP $F53 at $7159. The routine at $F53 just relocates the reset/reboot routine and jumps to $8133. For all practical purposes, will consider the start of the game to be $8133.

At the point where the boot code normally exits, write a routine to save $0-2FF before jumping to the monitor

```
6538:A2 00 BD 00 00 9D 00 20
:BD 00 01 9D 00 21 BD 00
:02 9D 00 22 E8 D0 EB 4C
:59 FF
```

At the end of boot 1, we want to move pages $64 and $65 back to the text page before jumping to boot 2. Pages $66 and $67 were not altered and do not have to be moved.

```
987D:A0 00 B9 00 64 99 00 04
:B9 00 65 99 00 05 C8 D0
:F1 4C 46 04
```

Execute $9600 to load in the game.

```
9600G
```

The game is now loaded into memory and occupies memory from $C00 to $BFFF. Hi-res page 1 is blank except for pages $20-22 which we used to store pages $0-2. We'll use up the rest of this space with $A300 to $BFFF.

```
2300<A300.BFFFM
```

Now, we have to save memory from $C00 to $A2FF. Under normal conditions, this chunk of memory could not be saved all at once because DOS uses memory from about $9600 to $BFFF. However, we modified the boot program on the copy disk earlier so it would not read in all of DOS at boot. Insert the copy disk and reboot.

```
C600G
```

When you hear the beep, the RWTS will be in memory and the Epoch program will still be intact so we can use the RWTS to write it to the disk. Turn off the disk drive first.

```
C0E8
```

At $B7E8, is the IOB which contains the information the RWTS uses for reading and writing, such as Track, Sector, etc. First, enter the disk volume (00 matches anything), track and sector.

```
B7EB:00 0D 02
```

Tell the IOB where in memory to read from (all information will be written backward) and specify the write command.

```
B7F0:00 A2 00 00 02
```

Enter the number of pages to be written.

```
B7E1:97
```

We will use the multi-sector read/write routine at $B793 to write the game code to the copy disk. We've entered track, sector, command, where to read from, and # of pages to write. All other necessary IOB information was already intact upon booting the disk so we're ready to write.

```
B793G
```

Next, run your sector editor and edit the copy disk.

Trk	Sct	Byte	From	To
00	01	00	??	20 93 B7 A2 00 BD 00 B7 9D 00 03 E8 D0 F7 4C 11 03 BD 00 23 9D 00 A3 E8 D0 F7 EE 13 03 EE 16 03 AD 13 03 C9 40 D0 EA BD 00 20 9D 00 00 BD 00 21 9D 00 01 BD 00 22 9D 00 02 E8 D0 EB A9 20 85 E6 20 F2 F3 4C 33 81

This routine will be part of boot stage 1 which loads into $B800. First, it calls $B793 to read in the game program (from $C00 to $A2FF) then it relocates itself into $300 ($B800 will get overwritten during the memory move) and moves $2300-3FFF back to $A300 and $2000-22FF to $0000. Finally, it clears the Hi-res page and jumps to $8133 to start the game.

All that is missing right now is the IOB information to tell $B793 where to load in the game. Enter the following at byte $E8 of the same sector.

Trk	Sct	Byte	From	To
00	01	E8	??	01 60 01 00 0D 02 FB B7 00 A2 00 00 01
		E1	??	97

Re-write the sector and you should now have a non-protected working copy of Epoch. Little by little, we're going to shorten up the Most Wanted List. There's more next time!

Softkey for...

Microcomputer Workshops disks

Microcomputer Workshops

Softkey for...

Intellectual Software disks

Intellectual Software

I have deprotected several educational disks from Microcomputer Workshops as well as Intellectual Software and they have the same identical protection. This Softkey will work for disks from these two companies assuming they used the same protection on other releases that I have not seen.

These disks contain a slightly altered RWTS which can read the normal as well as the protected tracks. By capturing this RWTS and doing a swap copy with Super IOB, you can deprotect these disks.

Begin by boot code tracing the disk to get the RWTS.

```
CALL -151
9600<C600.C6FFM
96FA:98 N 9801:4C 59 FF
9600G
9800<800.8FFM
980E:98 N 984B:59 FF
9600G
C0E8
```

By following the steps above, the RWTS will be in memory at $B800. It uses location $31 for the $AA mark in the data prolog and epilog but it can be changed so we don't have to bother with any extra work during the copy.

```
B8F0:C9 AA
B93E:C9 AA
```

Move this RWTS to the Super IOB swap RWTS location ($1900) and reboot a slave disk containing no HELLO program.

```
1900<B800.BFFFM
C600G
```

For safe keeping, save it to disk.

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

To copy the disk, install the Super IOB swap controller listed at the end of this article and make sure the saved RWTS is in memory before running the copy program. Once the copy process is completed, the copy you made should work just like original. In many cases, sector edits must be done to the RWTS but this RWTS also has the capability of reading normal DOS. You may want to keep the RWTS saved to disk because it should work for copying all disks from these companies.

David R. Hopkins — CO

I'm a bit aggravated that I can't reach Computist at (206) 832-3055. No one answers the phone at that number. I suggest that you at least get an answering machine so people could field questions and get information, like when is the next issue coming out.

You're right about the telephone at Computist. I'm not there much but by the time you read this I will at least be there more often. As to the telephone answering device, I've always hated to get a machine when I call long distance. But if enough

of the readers will let me know otherwise, I'll get one.....RDEXed

Vince Andrews WA

Softkey for...

Questron II

?

While snooping around in the GS memory I found a routine that would loop forever.

```
9/6bcb: a9 01 00     lda  #1
        f0 02        beq 9/6bd0 (+2)
        80 f9        bra  9/6bcb (-7)
9/6bd0: 22 17 c0 0a  jsl  a/c017
```

So I decided to change the lda #1 to a lda #0 and answered wrong to both documentation checks. Presto, it didn't lock up on me! Now I searched the bank for anything that would jump or branch to the address 9/6bd0. I found two of them.

```
9/6b6d: d0 03        bne 9/6b72 (+2)
        82 5e 00     brl  9/6bd0   <— I want this
9/6b72: f4 01 00     pea 1
```

This was the branch after the first questron. I changed the (d0 03) to (d0 00). Forcing it to take the next command. Thus you always answered correctly even when wrong.

```
9/6a4b: f0 03        beq 9/6a50 (+2)
        82 80 01     brl  9/6bd0   <— I want this
9/6a50: ad xx xx     lda  $xxxx
```

By changing the (f0 03) to (f0 00), I forced it to take the brl 9/6bd0 command. (brl=branch long) This is the routine I want because it is the one that determines whether or not it's time to do the documentation check or not.

Use a disk editor (such as Prosel's Disk Zap) and change these bytes on the disk (or you may search for them using the info above and change the values to remove the documentation check.)

Blk	Byte	From	To
1FC	76	03	00
	198	03	00
	1F4	01	00

Optional Files

I have created two additional files for those that would like to use them.

Q2.DEPROTECT is a TIF file (Temp Init File). Its main purpose is to remove the protection by altering the code in memory, not the code on the disk. Use this nifty program only on a backup copy of the boot disk. If the disk is full, then delete the FINDER.DATA file on the disk and try again. The file belongs to this directory:

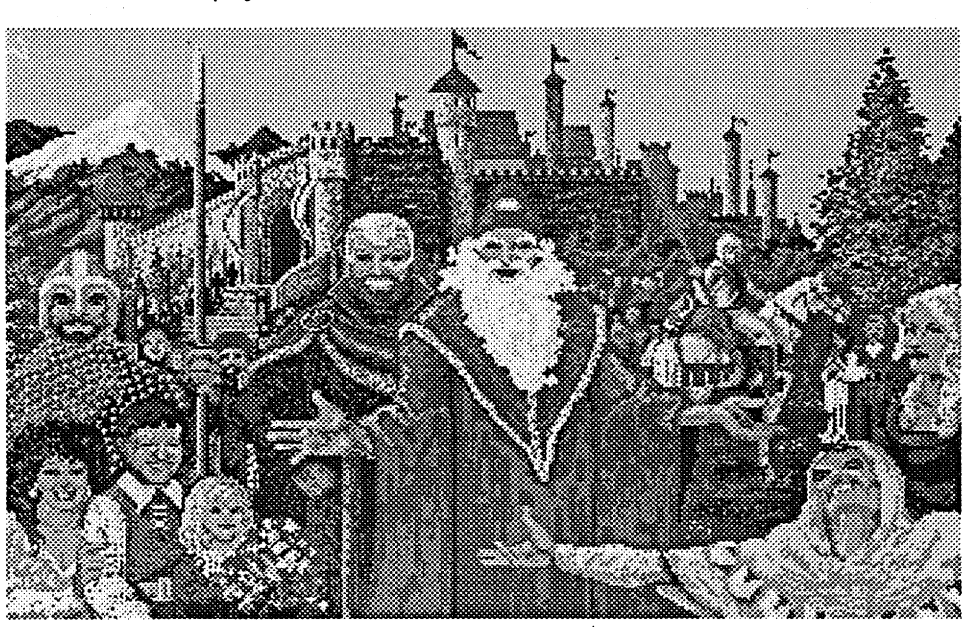
/Q2/SYSTEM/SYSTEM. SETUP

Q2.HD.CONVERT is a S16 file. This program is great for deprotecting the disk for you and/or converting the backup disk to a Hard Drive Runable Format. DO NOT USE ON ORIGINAL DISK! It alters the backup disk in such a way so that it is no longer bootable. Once the disk is converted, create a folder on your hard drive. Creat another folder and name it 'Q'. Copy the folder '/Q2/SSI-DATA' to the folder named 'Q' Copy the file 'Q2.SYS16' to the folder outside of 'Q' Copy the save game files to the folder named 'Q' Recopy the WD file from he boot disk to the folder named 'Q'. It should look something like this:

```
/HD1                          name of HD
  /QUESTRON.II  1st folder you created
    Q2.SYS16      from the boot disk
    QUESTRON.CHT  optional if you want to
    QUESTRON.CDA  install the CDA cheat
  /Q              2nd folder you created
    /SSIDATA      from the boot disk
    WD            from the BOOT DISK!
    NAMES         from saved game disk
    G0            from saved game disk
    G1            from saved game disk
    G2            from saved game disk
```

Q2.Deprotect Source

```
        lst    off
* Q2.DEPROTECT v1.0
* by Vince Andrews, 6 Jan 91
* A deprotect for the
* IIgs game called Questron II.
*
* Merlin 16+ source code
* Use the command, Open-Apple-6
* to assemble *
*
* TIF - A Temporary Initialize File which installs an
* Heart Beat Task that searches memory every 15
* seconds, maximum of 4 times, for the bytes that
* control the protection scheme. Once found, it will
* alter the bytes so that it will remove the
* Documentation Check and remove itself from
* memory
*
* To Install - Delete the file 'FINDER.DATA' from the
* main root directory of the Backup Copy of the
* original boot disk /Q2. Copy the file
* 'Q2.DEPROTECT' to the path
* '/Q2/SYSTEM/SYSTEM.SETUP' Boot and enjoy.
*
        xc
        xc
        mx    %00
        rel           ;relocatable
*
* These are the macros I used for this program.
*
Tool    MAC
        LDX   #]1
        JSL   $E10000
        <<<
_TLStartUp    MAC
        Tool  $201
        <<<
_TLShutDown   MAC
        Tool  $301
        <<<
_MMStartUp    MAC
        Tool  $202
        <<<
_MTStartUp    MAC
        Tool  $203
        <<<
_MMShutDown   MAC
        Tool  $302
        <<<
_MTShutDown   MAC
        Tool  $303
        <<<
_NewHandle    MAC
        Tool  $902
        <<<
_HUnlockAll   MAC
        Tool  $2302
        <<<
_BlockMove    MAC
        Tool  $2B02
        <<<
_SetHeartBeat MAC
        Tool  $1203
        <<<
_DelHeartBeat MAC
        Tool  $1303
        <<<
_GetNewID     MAC
        Tool  $2003
        <<<
PushLong MAC
        IF    #=]1
        PushWord    #^]1
        ELSE
        PushWord    ]1+2
        FIN
        PushWord    ]1
        <<<
PushWord MAC
        IF    #=]1
        PEA   ]1
        ELSE
        IF    MX/2
        LDA   ]1+1
        PHA
        FIN
        LDA   ]1
        PHA
        FIN
        <<<
*
* This is the start of the program. What this does is
* to reserve a unique block of memory and copy to it
* the Heart Beat Task routine. Once that is done, it
* activates this routine and quit back to the program.
*
Start   bra   Begin
        asc   '—> Vince Andrews, 19 Jan 91
              <—'
Begin   phk
        plb           ;data bank = code bank
        _TLStartUp    ;start tool locator
        _MTStartUp    ;start misc ools
        pha   t       ;push space
        _MMStartUp    ;start memory manager
        pla           ;pull user id
        sta   UserID
        pha           ;push space
        PushWord  #$F000   ;type id/aux id
        _GetNewID     ;make an id
        pla           ;pull code id
        sta   CodeID
        pha           push space
        pha
        PushLong  #HBEnd-HBStart+1
                      ;size of block
        PushWord  CodeID   ;code id for this
                      handle
        PushWord  #$C118   ;locked, fixed,
                      purge=2
        PushLong  #0  ;load anywhere
        _NewHandle
        pla           ;pull handle
        plx
        sta   0
        stx   2
        lda   [0]     ;get long address of block
        sta   BlkAddr
        ldy   #2
        lda   [0],y
        sta   BlkAddr+2
        PushLong  #HBStart  ;source
        PushLong  BlkAddr   ;destination
        PushLong  #HBEnd-HBStart+1
                      ;size
        _BlockMove    ;move handler code
        PushLong  BlkAddr   ;pointer to
                      hartbeat task
        _SetHeartBeat
        PushWord  UserID ;shutdown
                      everything
        _MMShutDown
        _MTShutDown
        _TLShutDown
        rtl
```



```
UserID  ds  2
*
* This is the Heart Beat Task routine. It is
* relocatable code so that means it can be loaded
* anywhere in memory without having any problems
* with direct addressing.
*
Beats   =   900     ;ticks
HBStart ds  4       ;task pointer starage chain
BeatCnt da  Beats   ;approximately 15 seconds
        da  $a55a   ;heartbeat task signature
        phk
        plb         ;data bank = code bank
        rep $30
        mx  %00     ;16-bit registers
        ldx #2      ;start at bank 2
        stz 0       ;start at address 0
        stx 2
        ldy #0      ;y-reg used for indexing
NByte   iny         ;next byte
        beq Quit    ;branch if we looped
        iny         ; over ffff, value will
        beq Quit    ; be 0000
CByte
        lda [0],y   ;get byte
        cmp #$03f0  ;is it bytes f0 03?
        beq CByte1  ;branch if match
        cmp #$8203  ;is it bytes 03 82?
        bne NByte   ;branch if no match
        dey         ;back up one byte
CByte1  iny         ;move forward by
        iny         ; two bytes
        lda [0],y   ;get byte
        cmp #$8082  ;is it bytes 82 80?
        bne NByte   ;branch if no match
        iny         ;move forward by
        iny         ; two bytes
        lda [0],y   ;get byte
        cmp #$ad01  ;is it bytes 01 ad?
        bne NByte   ;branch if no match
        dey
        dey         ;Now back up by 4 bytes
        dey
        dey
        lda #$00f0  ;replace f0 03 with f0 00
        sta [0],y   ; and store them
        per Data    ;push address of data
        ldy #BlkAddr-Data+2 ;push address
            of task
        lda (1,s),y ;get high-word of address
        pha
        dey         ;back up by 2 bytes
        dey
        lda (1,s),y ;get low-word of address
        pha
        _DelHeartBeat       ;remove this task
        ldy #CodeID-Data+2  ;push address
            of codeid
        lda (1,s),y ;get memory block id
        pha
        _HUnlockAll     ;unlock this block
        pla Data    ;remove address of data
Quit    per BeatCnt ;push address of
            counter
        ldy #0
        lda #Beats  ;reset the beats
        sta (1,s),y ;update the counter
        pla BeatCnt ;remove address of
            counter
        rtl         ;return to program
Data    equ *       ;data section
Cycle   da  '4'     ;perform this many times
CodeID  ds  2       ;memory block id
BlkAddr ds  4       ;address of the task
HBEnd   equ *
        typ tif     ;temporary initialize file
        sav q2.deprotect.l
```

Q2.HD.Convert Source

```
*
* Questron II Deprotect / HD Install
* By Vince C. Andrews 16 Jan 91
* Merlin-16+ — Use OA-6 to Assemble
*
        REL         ;rellocatable
        XC  ;65C02 mode
        XC  ;65816 mode
        MX  %00     ;full gs mode
        lst off
*
* Equates and Macros used:
*
Get_Dev_Num =   $20
Read_Block  =   $22
Write_Block =   $23
Quit2   =   $29
Key     =   $E0C000
Strobe  =   $E0C010
ProDOS  =   $E100A8
_WriteChr MAC
        Tool $180C
        <<<
Tool    MAC
        LDX #]1
        JSL $E10000
        <<<
_SetOutputDevice    MAC
        Tool $100C
        <<<
_InitTextDevice MAC
        Tool $150C
        <<<
*
* The start of the program:
*
        PHK
        PLB
        rep $30
        pea 1       ;Pascal device type
        pea 0       ;in slot 3
        pea 3
        _SetOutputDevice
        pea 1       ;initialize standard output
        _InitTextDevice
Start   clc
        jsr Menu
:wrong  jsr GetKey
        bcc :ok
        brl Quit
:ok     cmp #"1"
        beq Remove
        cmp #"2"
        beq Convert
        cmp #"Q"
        bne :wrong
        brl Quit
*
* Remove the Documentation Check:
*
Remove  jsr GetDev  ;Check if disk is online
        bcs Start
        lda #508    ;read block $508
        sta Blk_Num
        jsr Read
        bcs Start
        ldy #$76
        sep $20
        lda Buffer,y
        cmp #$03    ;check
        bne :nope   ;branch if already done
        lda #$0
        sta Buffer,y    ;patch the disk
        ldy #$198
        sta Buffer,y
        ldy #$1f4
        sta Buffer,y
        rep $20
        jsr Write   ;write the block back
        brl Start
:nope   sep $20
        cmp #$0
        beq :done   ;check for correct disk
        rep $20
        jsr Nope    ;wrong disk
        jsr GetKey
        brl Quit    ;exit
:done   rep $20
        brl Start
*
* Convert to run from Had Drive:
*
Convert jsr GetDev  ;find disk
        bcs :redo   ;not found so goto menu
        ldy #0
:1      lda Data,y  ;get block
        beq :done   ;exit if 0
        sta Blk_Num
        jsr Read
        bcs :redo   ;error
:2      iny
        iny
        lda Data,y  ;get byte position
        bne :3      ;branch if not 0
        iny
        iny
        jsr Write   ;update block
        bcs :redo
        bra :1
:redo   brl Start
:3      pha         ;push accum
        tya         ;put y in x reg.
        tax
        ply         ;pull byte
        sep $20
        lda Buffer,y    ;get byte
        cmp #'/'
        bne :nope1  ;branch if not '/'
        lda #'0'
        sta Buffer,y    ;otherwise, change
        iny         ; '/Q2' to '0/Q'
        lda #'/'
        sta Buffer,y
        iny
        lda #'Q'
        sta Buffer,y
        rep $20
        txa         ;put x in y
        tay
        bra :2      ;do some more
:nope   rep $20
        jsr Nope
        jsr GetKey
        brl Start
:nope1  sep $20
        cmp #'0'
        bne :nope
        bra :done1
:done   rep $20     ;this routine patches so
        lda #$54a   ; that the save game disk
        sta Blk_Num ; is in the same
            directory
        jsr Read    ; of the HD folder.
        bcs :redo
        ldy #$af
        lda #$d3
        sta Buffer,y
        lda #$ce
        ldy #$b4
        sta Buffer,y
        lda #$cb
        ldy #$b7
        sta Buffer,y
        lda #$ae82
        lda #$d1
        sta Buffer,y
        jsr Write
        bcs :redo
:done1  jsr Done
        jsr GetKey
        brl Start
*
* This is the Get Key Routine
*
GetKey  lda #0
        sep $20
]lup    lda Key
        bpl ]lup    ;get a keypress
        sta Strobe
        rep $20
        bcs :2      ;branch if set carry
        cmp #$e0
        bcc :1
        and #$DF    ;lower-case so upshift
:1      cmp #$9b
        beq :2      ;branch if ESC was
            pressed
        clc
        rts
:2      sec
        rts
GetKey2 jsr GetKey  ;get a keypress
        sec         ;and return with error
        rts
*
* GSOS Calls
*
Quit    jsl ProDOS
        da  Quit2
        adrl Parm_Q
        bra Quit
GetDev  jsl ProDOS
        da  Get_Dev_Num
        adrl Parm_GD
        bcs Error
        rts
Read    jsl ProDOS
        da  Read_Block
        adrl Parm_RW
        bcs Error
        rts
Write   jsl ProDOS
        da  Write_Block
        adrl Parm_RW
        bcs Error
        rts
*
* Error routine
*
Error   pha
        lda #0
        sep $30
        pla
        plx
        rep $30
        clc         ;clear the error
        cmp #$27
        beq IO_Error
        cmp #$2b
        beq Write_Protect
        cmp #$2f
        beq Not_Online
        cmp #$45
        beq No_Volume
        jsr Text
        brl GetKey2
IO_Error
        jsr TextA
        brl GetKey2
Write_Protect
        jsr TextB
        brl GetKey2
Not_Online
        jsr TextC
        brl GetKey2
No_Volume
        jsr TextD
        brl GetKey2
*
* Text output routines:
*
Text    jsr SENDMSG
        asc 0A,0D,'There was an error'
        asc 0A,0D,00
        rts
TextA   jsr SENDMSG
        asc 0A,0D,'Error: $27'
        asc 0A,0D,'I/O Error',00
        rts
TextB   jsr SENDMSG
        asc 0A,0D,'Error: $2B'
        asc 0A,0D,'Write Protect Error',00
        rts
TextC   jsr SENDMSG
        asc 0A,0D,'Error: $2F'
        asc 0A,0D,'Device Not Online Error',00
        rts
TextD   jsr SENDMSG
        asc 0A,0D,'Error: $45'
        asc 0A,0D,'Volume Not Found
            Error',00
        rts
Menu    jsr SENDMSG
        hex 05,0C,0A,0D,0A,0D
        ds  10,$20 ;print 10 spaces
        asc 'Press (1) Remove the Disk
            Protection'
        hex 0A,0D
        ds  10,$20 ;print 10 spaces
        asc 'Press (2) Convert to run from the
            HD'
        hex 0A,0D
```

```
        ds    10,$20 ;print 10 spaces
        asc   'Press (Q) Quit'
        hex   0A,0D,0A,0D
        ds    13,$20 ;print 13 spaces
        hex   0F
        asc   'Please Insert the Backup Copy '
        hex   0E,0A,0D
        ds    13,$20 ;print 13 spaces
        hex   0F
        asc   'of the Questron II Boot Disk.'
        hex   0E,00
        rts
Nope    jsr   SENDMSG
        hex   0A,0D,0A,0D
        ds    13,$20 ;print 13 spaces
        hex   0F
        asc   'This version of Questron does not
                work!'
        hex   0E,0A,0D,00
        rts
Done    jsr   SENDMSG
        hex   0A,0D,0A,0D
        asc   'Now create a folder on your HD
                and'
        asc   ' copy to it the file (Q2.SYS16).',
                0A, 0D
        asc   'Create another folder inside the '
        asc   'one you just created and name it
                (Q).',0A,0D
        asc   'Copy the folder (SSIDATA) to the
                folder '
        asc   'named (Q).',0A,0D
        asc   'Copy all the files on the save
                game '
        asc   'disk to the folder named (Q).',0A,
                0D
        asc   'Now replace the file (WD) on the
                HD with '
        asc   'the one from the Boot Disk.',0A,
                0D
        asc   'Run (Q2.SYS16) and enjoy!',0A,
                0D, 0A, 0D
        asc   '/HD1  <————————< name of
                HD',0A,0D
        asc   ' /QUESTRON.II  <-< 1st folder
                created',0A,0D
        asc   '  Q2.SYS16  <—< from the
                boot disk',0A,0D
        asc   '  /Q  <————————< 2nd folder
                created',0A,0D
        asc   '  /SSIDATA  <-< from the
                boot disk',0A,0D
        asc   '  WD  <————————<',0F,'from
                the boot disk',0E,0A,0D
        asc   '  NAMES  <————————< from the
                saved game disk',0A,0D
        asc   '  G0  <————————< from the
                saved game disk',0A,0D
        asc   '  G1  <————————< from the
                saved game disk',0A,0D
        asc   '  G2  <————————< from the
                saved game disk',0A,0D
        hex   00
        rts
*
* Jsr routines used by the program:
*
SENDMSG rep   %00100001
        lda   1,S
        inc           ;increament counter
        sta   1,S
        sep   $30     ;8-bit registers
        ldy   #0
        lda   (1,S),Y ;get 1 byte
        beq   :back   ;exit if zero
        jsr   OUTPUT  ;print it
        bra   SENDMSG    ;loop back for more
:back   rep   #$30    ;back to full 16 bit
        rts
OUTPUT  pha
        phx           ;save registers
        phy
        php
        rep   $30
        pha           ;push byte to print
        _WriteChr     ;print the byte
        plp
        ply
        plx           ;restore registers
        pla
        rts
*
* Parameters used:
*
VolName str   '/Q2' ;Volume name wanted
Parm_GD adrl  VolName   ;pointer to volume
                name
Parm_RW da    $0        ;device number
        adrl  Buffer    ;buffer address
Blk_Num da    $0        ;lo-order
        da    $0        ;hi-order
Parm_Q  adrl  $0        ;Quit
        da    $0
*
*   Block to edit, byte in block to edit:
*
Data    dw    1223,$105,$11e,$134,$166,0
        dw    1224,$F4,0
        dw    1225,$ED,0
        dw    1229,$24,$3D,$54,$69,$FD,
                $114,0
        dw    1233,$2,$C,$13,$1F,$35,$38,
                $166,0
        dw    1236,$ED,$125,0
        dw    1237,$4,$E,0
        dw    1238,$AC,0
        dw    1239,$C4,0
        dw    1240,$2D,0
        dw    1244,$BD,$D5,$ED,$106,0
        dw    1245,$D7,$EA,$101,$118,$131,
                $146, $1BA,0
        dw    1246,$56,$F2,0
        dw    1261,$19C,$1B2,$1D2,$1DF,0
        dw    0       ;done with the edits
*
* This is the buffer used for reading data into:
*
Buffer  ds    512,$8d
        sav   q2.hd.convert.l   ;name of link file
```

Q2.DEPROTECT

```
2000:9D 01 00 00 00 00 00 00 $FF53
2008:3E 01 00 00 00 0A 04 02 $1195
2010:00 00 01 00 00 10 00 00 $A338
2018:00 00 00 00 00 00 00 00 $5338
2020:00 00 01 00 00 00 00 00 $812D
2028:2C 00 40 00 51 32 2E 44 $4049
2030:45 50 52 4F 54 45 51 32 $8F61
2038:2E 44 45 50 52 4F 54 45 $8F2D
2040:F2 3E 01 00 00 80 20 2D $49F1
2048:2D 3E 20 56 69 6E 63 65 $4F57
2050:20 41 6E 64 72 65 77 73 $634F
2058:2C 20 31 39 20 4A 61 6E $1609
2060:20 39 31 20 3C 2D 2D 4B $99E6
2068:AB A2 01 02 22 00 00 E1 $A8AE
2070:A2 03 02 22 00 00 E1 48 $519F
2078:A2 02 02 22 00 00 E1 68 $894C
2080:8D C0 00 48 F4 00 F0 A2 $BFB8
2088:03 20 22 00 00 E1 68 8D $F3E7
2090:38 01 48 48 F4 00 00 F4 $6463
2098:7D 00 AD 38 01 48 F4 18 $F45E
20A0:C1 F4 00 00 F4 00 00 A2 $C4B4
20A8:02 09 22 00 00 E1 68 FA $5EB7
20B0:85 00 86 02 A7 00 8D 3A $0CA8
20B8:01 A0 02 00 B7 00 8D 3C $F245
20C0:01 F4 00 00 F4 C2 00 AD $C53D
20C8:3C 01 48 AD 3A 01 48 F4 $9B79
20D0:00 00 F4 7D 00 A2 02 2B $3EB1
20D8:22 00 00 E1 AD 3C 01 48 $B62F
20E0:AD 3A 01 48 A2 03 12 22 $8DAE
20E8:00 00 E1 AD C0 00 48 A2 $C0C4
20F0:02 03 22 00 00 E1 A2 03 $9264
20F8:03 22 00 00 E1 A2 01 03 $5224
2100:22 00 00 E1 6B 00 00 00 $FFF1
2108:00 00 00 84 03 5A A5 4B $AD5F
2110:AB C2 30 A2 02 00 64 00 $0D56
2118:86 02 A0 00 00 C8 F0 4E $0864
2120:C8 F0 4B B7 00 C9 F0 03 $C6AB
2128:F0 06 C9 03 82 D0 EE 88 $D902
2130:C8 C8 B7 00 C9 82 80 D0 $004D
2138:E4 C8 C8 B7 00 C9 01 AD $3F9F
2140:D0 DB 88 88 88 88 A9 F0 $7849
2148:00 97 00 62 2D 00 A0 06 $DB73
2150:00 B3 01 48 88 88 B3 01 $1A8E
2158:48 A2 03 13 22 00 00 E1 $2E95
2160:A0 04 00 B3 01 48 A2 02 $2690
2168:23 22 00 00 E1 68 62 9A $F04E
2170:FF A0 00 00 A9 84 03 93 $F70A
2178:01 68 6B 34 00 00 00 00 $B402
2180:00 00 00 F7 0D 00 00 00 $01B8
2188:00 0A 3C 4B 56 72 7A 80 $E607
2190:83 87 98 9C A7 F5 01 F0 $160D
2198:7D 00 C2 00 00           $A40D
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Q2.HD.CONVERT

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2000:4B 0A 00 00 00 00 00 00 $35E4
2008:9F 09 00 00 00 0A 04 02 $AB87
2010:00 00 01 00 00 10 00 00 $398A
2018:00 00 00 00 00 00 00 00 $E92A
2020:00 00 01 00 00 00 00 00 $1B9F
2028:2C 00 40 00 51 32 2E 48 $F65D
2030:44 2E 43 4F 4E 56 51 32 $5729
2038:2E 48 44 2E 43 4F 4E 56 $E173
2040:F2 9F 09 00 00 4B AB C2 $C33A
2048:30 F4 01 00 F4 00 00 F4 $4F7F
2050:03 00 A2 0C 10 22 00 00 $C3F7
2058:E1 F4 01 00 A2 0C 15 22 $564B
2060:00 00 E1 18 20 6E 02 20 $314B
2068:25 01 90 03 82 24 01 C9 $7372
2070:B1 00 F0 0D C9 B2 00 F0 $7EE5
2078:53 C9 D1 00 D0 E9 82 12 $C68A
2080:01 20 5A 01 B0 DD A9 FC $39DA
2088:01 8D 05 07 20 67 01 B0 $B4ED
2090:D2 A0 76 00 E2 20 B9 9F $1295
2098:07 C9 03 D0 19 A9 00 99 $7B02
20A0:9F 07 A0 98 01 99 9F 07 $76D9
20A8:A0 F4 01 99 9F 07 C2 20 $3A50
20B0:20 74 01 82 AD FF E2 20 $84CC
20B8:C9 00 F0 0B C2 20 20 53 $51B5
20C0:03 20 25 01 82 CC 00 C2 $720A
20C8:20 82 97 FF 20 5A 01 B0 $DAE3
20D0:20 A0 00 00 B9 0F 07 F0 $4EC0
20D8:52 8D 05 07 20 67 01 B0 $0A86
20E0:10 C8 C8 B9 0F 07 D0 0C $1108
20E8:C8 C8 20 74 01 B0 02 80 $0C01
20F0:E3 82 6F FF 48 98 AA 7A $2CBA
20F8:E2 20 B9 9F 07 C9 2F D0 $9300
2100:22 A9 30 99 9F 07 C8 A9 $2D5E
2108:2F 99 9F 07 C8 A9 51 99 $E7A6
2110:9F 07 C2 20 8A A8 80 C9 $40BC
2118:C2 20 20 53 03 20 25 01 $C2A1
2120:82 40 FF E2 20 C9 30 D0 $81D1
2128:EF 80 36 C2 20 A9 4A 05 $DEFD
2130:8D 05 07 20 67 01 B0 B9 $FBEC
2138:A0 AF 00 A9 D3 00 99 9F $83BE
2140:07 A9 CE 00 A0 B4 00 99 $DF69
2148:9F 07 A9 CB 00 A0 B7 00 $BD0A
2150:99 9F 07 A9 82 AE A0 D1 $3052
2158:00 99 9F 07 20 74 01 B0 $7D0B
2160:90 20 94 03 20 25 01 82 $BDBA
2168:F9 FE A9 00 00 E2 20 AF $D0FB
2170:00 C0 E0 10 FA 8F 10 C0 $BC62
2178:E0 C2 20 B0 0F C9 E0 00 $DA40
2180:90 03 29 DF 00 C9 9B 00 $E0C8
2188:F0 02 18 60 38 60 20 25 $6D53
2190:01 38 60 22 A8 00 E1 29 $10DE
2198:00 09 07 00 00 80 F4 22 $200E
21A0:A8 00 E1 20 00 FB 06 00 $A446
21A8:00 B0 1B 60 22 A8 00 E1 $3FDD
21B0:22 00 FF 06 00 00 B0 0E $F3CE
21B8:60 22 A8 00 E1 23 00 FF $6DEA
21C0:06 00 00 B0 01 60 48 A9 $2B9B
21C8:00 00 E2 30 68 FA C2 30 $53A2
21D0:18 C9 27 00 F0 15 C9 2B $6FEB
21D8:00 F0 16 C9 2F 00 F0 17 $456F
21E0:C9 45 00 F0 18 20 BE 01 $8EB8
21E8:82 A3 FF 20 D9 01 82 9D $2A6B
21F0:FF 20 F5 01 82 97 FF 20 $81F1
21F8:1B 02 82 91 FF 20 45 02 $090A
2200:82 8B FF 20 CD 06 0A 0D $C630
2208:54 68 65 72 65 20 77 61 $28BA
2210:73 20 61 6E 20 65 72 72 $3786
2218:6F 72 0A 0D 00 60 20 CD $D1B4
2220:06 0A 0D 45 72 72 6F 72 $3979
2228:3A 20 24 32 37 0A 0D 49 $F6D5
2230:2F 4F 20 45 72 72 6F 72 $7F40
2238:00 60 20 CD 06 0A 0D 45 $0860
2240:72 72 6F 72 3A 20 24 32 $475A
2248:42 0A 0D 57 72 69 74 65 $BEE1
2250:20 50 72 6F 74 65 63 74 $58A9
2258:20 45 72 72 6F 72 00 60 $9996
2260:20 CD 06 0A 0D 45 72 72 $9DA3
2268:6F 72 3A 20 24 32 46 0A $B08F
2270:0D 44 65 76 69 63 65 20 $091D
2278:4E 6F 74 20 4F 6E 6C 69 $D9C2
2280:6E 65 20 45 72 72 6F 72 $C033
2288:00 60 20 CD 06 0A 0D 45 $0763
2290:72 72 6F 72 3A 20 24 34 $FE2A
2298:35 0A 0D 56 6F 6C 75 6D $C8B0
22A0:65 20 4E 6F 74 20 46 6F $643D
22A8:75 6E 64 20 45 72 72 6F $F482
22B0:72 00 60 20 CD 06 05 0C $C7AB
22B8:0A 0D 0A 0D 20 20 20 20 $DF23
22C0:20 20 20 20 20 20 50 72 $658A
22C8:65 73 73 20 28 31 29 20 $FA44
22D0:20 52 65 6D 6F 76 65 20 $D055
22D8:74 68 65 20 44 69 73 6B $41E0
22E0:20 50 72 6F 74 65 63 74 $1778
22E8:69 6F 6E 0A 0D 20 20 20 $2916
22F0:20 20 20 20 20 20 20 50 $09CE
22F8:72 65 73 73 20 28 32 29 $49FE
2300:20 20 43 6F 6E 76 65 72 $88D9
2308:74 20 74 6F 20 72 75 6E $35A1
2310:20 66 72 6F 6D 20 74 68 $FBD6
2318:65 20 48 44 0A 0D 20 20 $FDB1
2320:20 20 20 20 20 20 20 20 $6DE1
2328:50 72 65 73 73 20 28 51 $7231
2330:29 20 20 51 75 69 74 0A $D442
2338:0D 0A 0D 20 20 20 20 20 $36CF
2340:20 20 20 20 20 20 20 20 $D67F
2348:0F 50 6C 65 61 73 65 20 $8B67
2350:49 6E 73 65 72 74 20 74 $5C14
2358:68 65 20 42 61 63 6B 75 $2852
2360:70 20 43 6F 70 79 20 0E $3B2F
2368:0A 0D 20 20 20 20 20 20 $1F4B
2370:20 20 20 20 20 20 20 0F $002C
2378:6F 66 20 74 68 65 20 51 $93FC
2380:75 65 73 74 72 6F 6E 20 $6C37
2388:49 49 20 42 6F 6F 74 20 $3735
2390:44 69 73 6B 2E 0E 00 60 $A39E
2398:20 CD 06 0A 0D 0A 0D 20 $29C4
23A0:20 20 20 20 20 20 20 20 $7984
23A8:20 20 20 20 0F 54 68 69 $37C7
23B0:73 20 76 65 72 73 69 6F $1DBB
23B8:6E 20 6F 66 20 51 75 65 $89C2
23C0:73 74 72 6F 6E 20 64 6F $CC53
23C8:65 73 20 6E 6F 74 20 77 $B5F6
23D0:6F 72 6B 21 0E 0A 0D 00 $4F0D
23D8:60 20 CD 06 0A 0D 0A 0D $6513
23E0:4E 6F 77 20 63 72 65 61 $4610
23E8:74 65 20 61 20 66 6F 6C $C55E
23F0:64 65 72 20 6F 6E 20 79 $DD46
23F8:6F 75 72 20 48 44 20 61 $0757
2400:6E 64 20 63 6F 70 79 20 $4AB4
2408:74 6F 20 69 74 20 74 68 $041D
2410:65 20 66 69 6C 65 20 28 $0B1A
2418:51 32 2E 53 59 53 31 36 $4639
2420:29 2E 0A 0D 43 72 65 61 $5246
2428:74 65 20 61 6E 6F 74 68 $40DF
2430:65 72 20 66 6F 6C 64 65 $F8BD
2438:72 20 69 6E 73 69 64 65 $B6A6
2440:20 74 68 65 20 6F 6E 65 $6053
2448:20 79 6F 75 20 6A 75 73 $7E31
2450:74 20 63 72 65 61 74 65 $754A
2458:64 20 61 6E 64 20 6E 61 $BB8A
2460:6D 65 20 69 74 20 28 51 $C6C7
2468:29 2E 0A 0D 43 6F 70 79 $9FF5
2470:20 74 68 65 20 66 6F 6C $3763
2478:64 65 72 20 28 53 53 49 $82F9
2480:44 41 54 41 29 20 74 6F $1F21
2488:20 74 68 65 20 66 6F 6C $B7F7
2490:64 65 72 20 6E 61 6D 65 $1A60
2498:64 20 28 51 29 2E 0A 0D $113A
24A0:43 6F 70 79 20 61 6C 6C $63B2
24A8:20 74 68 65 20 66 69 6C $8492
24B0:65 73 20 6F 6E 20 74 68 $2DB3
24B8:65 20 73 61 76 65 20 67 $540E
24C0:61 6D 65 20 64 69 73 6B $AE9A
24C8:20 74 6F 20 74 68 65 20 $512A
24D0:66 6F 6C 64 65 72 20 6E $C586
24D8:61 6D 65 64 20 28 51 29 $F329
24E0:2E 0A 0D 4E 6F 77 20 72 $A28F
24E8:65 70 6C 61 63 65 20 74 $6F6D
24F0:68 65 20 66 69 6C 65 20 $281C
24F8:28 57 44 29 20 6F 6E 20 $34BA
2500:74 68 65 20 48 44 20 77 $3D1E
2508:69 74 68 20 74 68 65 20 $074C
2510:6F 6E 65 20 66 72 6F 6D $2327
2518:20 74 68 65 20 42 6F 6F $D84A
2520:74 20 44 69 73 6B 2E 0A $94D7
2528:0D 52 75 6E 20 28 51 32 $4CF9
2530:2E 53 59 53 31 36 29 20 $9D21
2538:61 6E 64 20 65 6E 6A 6F $EB70
2540:79 21 0A 0D 0A 0D 2F 48 $0F70
2548:44 31 20 20 20 20 20 3C $60D4
2550:2D 2D 2D 2D 2D 2D 2D 2D $980C
2558:2D 2D 2D 2D 3C 20 6E 61 $9E68
2560:6D 65 20 6F 66 20 48 44 $CD18
2568:0A 0D 20 20 20 2F 51 55 $1B9E
2570:45 53 54 52 4F 4E 2E 49 $3971
2578:49 20 20 20 20 20 3C 2D $266A
2580:3C 20 31 73 74 20 66 6F $27EB
2588:6C 64 65 72 20 63 72 65 $46C2
2590:61 74 65 64 0A 0D 20 20 $86C6
2598:20 20 20 51 32 2E 53 59 $A0EA
25A0:53 31 36 20 20 20 20 20 $6347
25A8:3C 2D 2D 2D 3C 20 66 72 $9A83
25B0:6F 6D 20 74 68 65 20 62 $4B4D
25B8:6F 6F 74 20 64 69 73 6B $9C7D
25C0:0A 0D 20 20 20 20 20 2F $073E
25C8:51 20 20 20 20 20 3C 2D $3415
25D0:2D 2D 2D 2D 2D 2D 2D 2D $0C9D
25D8:3C 20 32 6E 64 20 66 6F $BF05
25E0:6C 64 65 72 20 63 72 65 $5E4C
25E8:61 74 65 64 0A 0D 20 20 $1E28
25F0:20 20 20 20 20 2F 53 53 $6F7B
25F8:49 44 41 54 41 20 20 20 $754A
2600:20 20 3C 2D 3C 20 66 72 $79DF
2608:6F 6D 20 74 68 65 20 62 $5851
2610:6F 6F 74 20 64 69 73 6B $7F21
2618:0A 0D 20 20 20 20 20 20 $1B25
2620:20 57 44 20 20 20 20 20 $2878
2628:3C 2D 2D 2D 2D 2D 2D 2D $5831
2630:3C 20 0F 66 72 6F 6D 20 $8919
2638:74 68 65 20 62 6F 6F 74 $9668
2640:20 64 69 73 6B 0E 0A 0D $EA78
2648:20 20 20 20 20 20 20 4E $244F
2650:41 4D 45 53 20 20 20 20 $722E
2658:20 3C 2D 2D 2D 2D 3C 20 $3A3A
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2668:20 73 61 76 65 64 20 67 $B423
2670:61 6D 65 20 64 69 73 6B $CEA7
2678:0A 0D 20 20 20 20 20 20 $FAC3
2680:20 47 30 20 20 20 20 20 $8342
2688:3C 2D 2D 2D 2D 2D 2D 2D $83AB
2690:3C 20 66 72 6F 6D 20 74 $1E4B
2698:68 65 20 73 61 76 65 64 $30EB
26A0:20 67 61 6D 65 20 64 69 $1B1C
26A8:73 6B 0A 0D 20 20 20 20 $BFB6
26B0:20 20 20 47 31 20 20 20 $BCD4
26B8:20 20 3C 2D 2D 2D 2D 2D $199C
26C0:2D 2D 3C 20 66 72 6F 6D $33E9
26C8:20 74 68 65 20 73 61 76 $0F9C
26D0:65 64 20 67 61 6D 65 20 $BBE4
26D8:64 69 73 6B 0A 0D 20 20 $1888
26E0:20 20 20 20 20 47 32 20 $A867
26E8:20 20 20 20 3C 2D 2D 2D $DA30
26F0:2D 2D 2D 2D 3C 20 66 72 $7B95
26F8:6F 6D 20 74 68 65 20 73 $EB33
2700:61 76 65 64 20 67 61 6D $ED98
2708:65 20 64 69 73 6B 0A 0D $F473
2710:00 60 C2 21 A3 01 1A 83 $82DD
2718:01 E2 30 A0 00 B3 01 F0 $A55B
2720:05 20 E4 06 80 EC C2 30 $8605
2728:60 48 DA 5A 08 C2 30 48 $BD93
2730:A2 0C 18 22 00 00 E1 28 $F8AD
2738:7A FA 68 60 03 2F 51 32 $D944
2740:F7 06 00 00 00 00 9F 07 $743A
2748:00 00 00 00 00 00 00 00 $341A
2750:00 00 00 00 C7 04 05 01 $BA28
2758:1E 01 34 01 66 01 00 00 $11EC
2760:C8 04 F4 00 00 00 C9 04 $CD71
2768:ED 00 00 00 CD 04 24 00 $17EB
2770:3D 00 54 00 69 00 FD 00 $FB06
2778:14 01 00 00 D1 04 02 00 $A509
2780:0C 00 13 00 1F 00 35 00 $9336
2788:38 00 66 01 00 00 D4 04 $AF8E
2790:ED 00 25 01 00 00 D5 04 $C891
2798:04 00 0E 00 00 00 D6 04 $1EFB
27A0:AC 00 00 00 D7 04 C4 00 $CD18
27A8:00 00 D8 04 2D 00 00 00 $93DF
27B0:DC 04 BD 00 D5 00 ED 00 $371C
27B8:06 01 00 00 DD 04 D7 00 $CE56
27C0:EA 00 01 01 18 01 31 01 $7E78
27C8:46 01 BA 01 00 00 DE 04 $9394
27D0:56 00 F2 00 00 00 ED 04 $39E9
27D8:9C 01 B2 01 D2 01 DF 01 $0294
27E0:00 00 00 00 8D 8D 8D 8D $7076
27E8:8D 8D 8D 8D 8D 8D 8D 8D $088E
27F0:8D 8D 8D 8D 8D 8D 8D 8D $F0F6
27F8:8D 8D 8D 8D 8D 8D 8D 8D $880E
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2818:8D 8D 8D 8D 8D 8D 8D 8D $880E
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2828:8D 8D 8D 8D 8D 8D 8D 8D $088E
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28A8:8D 8D 8D 8D 8D 8D 8D 8D $080E
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28B8:8D 8D 8D 8D 8D 8D 8D 8D $888E
28C0:8D 8D 8D 8D 8D 8D 8D 8D $70F6
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28E8:8D 8D 8D 8D 8D 8D 8D 8D $080E
28F0:8D 8D 8D 8D 8D 8D 8D 8D $F076
28F8:8D 8D 8D 8D 8D 8D 8D 8D $888E
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29A8:8D 8D 8D 8D 8D 8D 8D 8D $080E
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29B8:8D 8D 8D 8D 8D 8D 8D 8D $888E
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29C8:8D 8D 8D 8D 8D 8D 8D 8D $080E
29D0:8D 8D 8D 8D 8D 8D 8D 8D $F076
29D8:8D 8D 8D 8D 8D 8D 8D 8D $888E
29E0:8D 8D 8D 8D F7 37 00 00 $50FC
29E8:00 00 1A 20 23 3D 45 48 $B55E
29F0:52 5B 61 67 6C 7A 7D 88 $A653
29F8:90 95 98 9F A6 B6 BF C5 $AB0A
2A00:CB D6 D9 EC EF FA 0E 03 $2FD8
2A08:0C 15 18 1D 20 4A A1 A7 $6055
2A10:AD B3 B9 BF DA F6 02 1C $3ABA
2A18:46 6F 01 54 95 82 00 DD $31F6
2A20:F5 03 00 01 07 9F 07 F5 $CDAD
2A28:03 00 FB 06 F7 06 F5 03 $013A
2A30:00 7A 01 FF 06 F5 03 00 $15D2
2A38:6D 01 FF 06 F5 03 00 60 $5E57
2A40:01 FB 06 F5 03 00 54 01 $237C
2A48:09 07 00               $3C46
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Ross A. Holmes

Starting in 1992, I've noticed that when using Copy II Plus v9.1 with the clock card in my Apple IIe computer, the date has reverted to 1987. Is there a program out there to fix this problem so that the date has the correct year?

Krakowicz NY

The Basics of Kracking Part #13

Softkey for...

Sheila

?

The purpose of this essay is not to provide you with a cookbook for cracking Sheila. Rather, I am going to describe the general approach I took, in the hope that it will be of use to you in cracking similar programs.

Step 1: Case the Joint!

The first step of cracking any program is to get an idea of the nature of the protection. Does the program access the disk? If so, are the disk accesses necessary to the program's function, part of the protection, or both? Does the program use a custom routine to read the disk, or a modified version of the standard DOS? If the latter, what sort of modifications have been made?

Sheila is an arcade-style adventure. There are 5 mazes, and the disk is accessed each time you enter a new maze and for a Hi-Res Castle at the beginning). If you open the drive door while it's trying to load a maze, it recalibrates and tries again; this suggested to me a fairly normal RWTS, since many custom routines don't bother with this. The Boot was manifestly abnormal, with much head movement and 3 recalibrations. Furthermore, the disk would not boot unless write enabled. Such a boot offers much opportunity for chicanery, so I resolved to use boot tracing only as a last resort. Nibble copies would not boot, but I found that I could switch to a copy once the program was going, indicating that the major protection was in the boot. Examining a nibble dump of the disk (using the Inspector), I concluded that most tracks were nearly normal 3.2, but with a modified sector header.

Step 2: Get It Out of Memory.

Having figured out as much as I could from "outside", I decided that it was time to get a look inside the program. The trick in getting a program out of memory is to preserve $0-$7FF, much of which is modified by a standard reset. As you probably know, this can be done either by tracing the boot (which I hoped to avoid) or by the use of a modified monitor. Typically, the monitor is modified so that the reset vector at $FFFC points at a memory move routine which relocates pages 0-8 somewhere out of the way. The modified monitor can then be installed in a RAM card. It is generally necessary to protect the RAM card in some way so that the program cannot erase it or turn it off (my card has been modified for this purpose, but I understand that it is possible to fool many programs by putting the card in slot 1 instead of 0).

There are several of these cracking monitors going around, including versions by Bozo and Lockbuster, and a commercial version called Masterkey+. A modest refinement of this method is to use a nonmaskable interrupt (NMI) instead of a reset. To generate a NMI, you just add a switch to connect peripheral pin #29 (any card) to pin #26 through a 100 OHM resistor. When the 6502 sees a NMI, it pushes the status register and program counter onto the stack, then jumps via $FFFA. This I've modified to lead to a routine (inside the monitor) which moves pages 0-8 to $2100-$29FF, then jumps to the old monitor reset routine.

After getting inside the program in this way, I manually moved $9600-$9CFF to $2A00-$30FF and $9D00-$BFFF to $D000-$F2FF on the RAM card, thus clearing the way for a slave boot. I then saved all the pieces of the program onto a normal 3.3 disk. As a test, I wrote a routine to move everything back, reload the registers, and do a RTI (return from interrupt). The program restarted as expected, then bombed out trying to read the disk. Inspection of the code revealed a fairly standard DOS in the usual place.

It seemed to be patched rather than reassembled, since I saw several routines which I was fairly certain that the program didn't need. RWTS was in its usual home ($B800-$BFFF). Using the Inspector in conjunction with Sheila's RWTS, I was now able to read most of the tracks on the original disk, but I couldn't see anything resembling a catalog. This suggested that the program was loading data from known disk locations using RWTS directly. To test this hypothesis, I interrupted while the program was trying to access the disk. As expected, examination of the top of the stack indicated that the program counter was in RWTS.

Step 3: Convert the Data Tracks.

There were still those disk loads to contend with. Poking around inside Sheila, I found a somewhat modified RWTS with an entry at the usual location: $BD00. Then I booted a 32K DOS 3.3 Slave (which I had made by pulling out the last row of RAM chips, booting a Master and INIT-ing a Slave). Now I had Sheila RWTS at $BD00, and DOS 3.3 RWTS at $7D00. Then I entered the Inspector, and set the RWTS vector at $3DC-$3DE to point to $BD00. Then I read in some sectors of Sheila, saving them in memory (being careful not to overwrite either RWTS). Next I switched the RWTS vector to $B700, and wrote the sectors I had read to the corresponding tracks on a DOS 3.3 disk, until I had converted all the tracks I could read. I then repeated the process with a 32K 3.2 RWTS, so that when I finished I had both a 3.3 and a 3.2 disk with the data tracks from Sheila.

Step 4: Convert the DOS

The next step was to modify the Sheila RWTS so that it would read from a normal format disk. Since Sheila's DOS seemed almost 3.2, I decided first to see if I could get it to read the 3.2 data disk. This was surprisingly easy; I just patched the sector header in the read portion of Sheila RWTS to match normal DOS 3.2 (D5 AA DD) and it would happily read data off the 3.2 disk that I had made. Unfortunately, I wanted 3.3. My first attempt at conversion to 3.3 was simply to replace the entire RWTS from Sheila with a normal 3.3 RWTS. At first it looked good; the program loaded the first maze from my 3.3 data disk. Unfortunately, the minute I hit a key it locked up.

A postmortem indicated that a keyboard input routine on page 4 had mysteriously turned to garbage. Out came the DOS source listings. Sure enough, RWTS stores data in locations $478, $4F8, $578, $5F8, and $6F8 (these are in the text page area, but they do not show on the screen). Clearly, it was going to be necessary to modify the RWTS to eliminate the conflict.

Looking through RWTS, I noticed that locations $BCE0 to $BCFF were apparently unused by both the normal 3.3 and Sheila RWTS. It was a simple task to edit the DOS source RWTS listing to use this area instead of the text page region. At Long-John's suggestion, I also moved the sector interleaving table, normally at $BFB8-$BFC7, to reside at $BCF0-$BCFF, in case Sheila was using that area for something else (3.2 RWTS doesn't have a sector interleaving table). I then reassembled RWTS using LISA 2.5. Rather than completely replace Sheila's RWTS, I decided to move in only the read routines from my reassembled RWTS, since I knew Sheila didn't write to disk. The areas switched were as follows: $B800-$B8C1, $BA29-$BA95, $BB00-$BCFF, and $BEAF-$BFFF. I then restarted Sheila, and verified that the program ran correctly with the 3.3 data disk.

Step 5: Putting it All Together

The final task was to get Sheila onto the disk with the data. There was one problem; one of the data tracks was $11, normal location of the Catalog and VTOC. Clearly it would be necessary to modify either Sheila or DOS to eliminate the conflict. Taking the path of least resistance, I elected to modify DOS to use track $15 instead of $11. This meant that normal DOS would be unable to find the catalog, but it wouldn't interfere with COPYA, which doesn't make use of the catalog. To do this, I changed location $AC01 in DOS from $11 to $15, then initialized a disk. This placed the VTOC on track $15. Then, using the Inspector, I changed track $15, sector $0, byte $1 from $11 to $15, so that DOS would know to use track $15 for the catalog. Then, I copied the data tracks from my Sheila 3.3 data disk onto the new disk, and changed the sector-use BITMAP to protect the data sectors and the catalog. I then assembled all of the pieces of Sheila into a single file, and prefaced it with a memory move to put everything back where it belonged. Finally, I booted the data disk (with catalog on track $15) and BSAVE'd Sheila.

This completed the conversion of Sheila to COPYA format.

George Rose — TX

Softkey for...

Rounding

Gamco

Requirements:
Rounding (107A-5.25" disk)
Copy II Plus
1 blank disk punched for use on both sides

"Rounding" is a math education disk by Gamco of Big Springs, Texas. When Copy II+ was used to make a fast copy it produced errors on track $22. I used the view files option to get an idea what the Startup program did. Here is my fix.

1. Copy both sides of the disk with a copy program that will ignore the error on track $22.
2. On the front side, delete the Startup INT file in the main directory. This file changes the prefix to the G107 subdirectory and, apparently, checks track $22.
3. Copy the files from the G107 subdirectory on both the front and the back sides into the main directory of the respective sides. This gets around the prefix change to the subdirectory for both sides and the disk check to the front side that the deleted Startup file had made. The deleted Startup file is replaced by another one that had been in the subdirectory. The new one does not refer to the subdirectory or the disk check. G107 refers to the fact that Rounding is Gamco's disk # 107A.
4. Delete the Start (not Startup) BASIC file on the front side that had been in the subdirectory.
5. Delete the G107 subdirectory on each side.

The Unknown Contributor

Softkey for...

Foundations in State History: Focus on Indiana

Specialized Educational Software Inc

Requirements:
Focus on Indiana (six disks)
MECC Copy utility
DOS 3.3 disk without a hello program
Copy II Plus (or other DOS 3.3 utility)
12 blank disks (six are used as intermediate copies and may be used elsewhere after final copies are made.)

I tried various methods before hitting on this one. I'm not entirely sure why it works. Perhaps someone more knowledgeable can explain.

On the white disk (volume #1) some of the program files are on track $02. This is why I used the file copy program to make the final copies.

The MECC Copy program reads the original disks and seems to normalize the intermediate copies but these copies do not work.

Each of the six original disks are a different color and have a different volume number. These are:

Color	Volume#
White	1
Green	2
Red	3
Blue	4
Brown	5
Black	6

Step-by-step

1. Boot the DOS 3.3 disk and enter BASIC (]).Initialize the six final copy disks using the correct volume number. Mark each disk with the volume number.

```
NEW
INIT HELLO,V1          insert blank disk
DELETE HELLO
INIT HELLO,V2          insert blank disk
DELETE HELLO
INIT HELLO,V3          insert blank disk
DELETE HELLO
INIT HELLO,V4          insert blank disk
DELETE HELLO
INIT HELLO,V5          insert blank disk
DELETE HELLO
INIT HELLO,V6          insert blank disk
DELETE HELLO
```

2. Boot MECC Copy and copy all six disks to the six **blank** disks. Mark each disk with the volume number. Mark these as the intermediate copies.
3. Boot CopyIIPlus and use Utilities to delete the DOS from all of the disks you made in step 1 **except** for volume #1.
4. Use CopyIIPlus Utilities to copy the files from each intermediate copy to each final copy disk.

That should do it.

Note: There is some data on track $23 that doesn't get copied. I'm not sure what problems, if any, this may cause. I've noticed no difference in the operation of my copies in many months of use.

Jack Nissel — PA

Softkey for...

Microzine #19

Scholastic Software

Requirements:
A blank disk that has a notch on both sides or two blank disks
COPYA from your DOS 3.3 System Master
A sector editor

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

POKE 47426,24 *ignore checksums and epilogs*
RUN COPYA

2. Copy each side of your original disk to your blank disk.
3. Make the following sector edits to side 1 of your copy.

Trk	Sct	Byte	From	To
00	0B	42	34	06
01	07	75-79	D7 AE D3 D0 C3	C8 C5 CC CC CF

4. Write each sector back to the disk.

Softkey for...

Kids at Work

Scholastic Software

Requirements:
The original Kids At Work disk
A blank disk
COPYA from your DOS 3.3 system master
A sector editor

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

POKE 47426,24 *ignore checksums and epilogs*
RUN COPYA

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

Trk	Sct	Byte	From	To
00	05	93-95	C6 2A D0	4C 86 02

4. Write the sector back to the disk.

Softkey for...

Monsters and Make Believe

Pelican Software

Requirements:
The original Monsters And Make Believe disk
A blank disk that has a notch on both sides or two blank disks
COPYA from your DOS 3.3 system master
A sector editor

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

POKE 47426,24 *ignore checksums and epilogs*
RUN COPYA

2. Copy each side of your original disk to your blank disks.
3. Make the following sector edits to side 1 of your copy.

Trk	Sct	Byte	From	To
01	09	75-7B	D8 CD C7 D0 D2 D4 B1	C8 C9 A0 A0 A0 A0 A0

4. Write the sector back to the disk.

Softkey for...

Indiana Jones in Revenge of the Ancients

Mindscape

Jim Gallagher's softkey in issue #59 for GoldFinger works for this Mindscape release.

Requirements:
The original Indiana Jones Revenge Of The Ancients disk
A blank disk
COPYA from your DOS 3.3 system disk
A sector editor

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

POKE 47426,24 *ignore checksums and epilogs*
RUN COPYA

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

Trk	Sct	Byte	From	To
00	0C	90	C6	60

4. Write the sector back to the disk.

Softkey for...

Parts of Speech Verbs I Parts of Speech Nouns

Continental Press

Requirements:
The original disk(s)
A blank initialized disk for each title
A blank initialized slave disk
Super IOB v1.5
A way to reset into the monitor

These titles can be deprotected by using Super IOB with the Swap Controller and use the RWTS of the protected disk to read the original disk then use a normal RWTS to write the information back to your blank disk.

1. INITialize your blank disk(s)

INIT HE
DELETE HE

2. Boot your original disk and at the Applesoft prompt reset into the monitor.
3. Move the RWTS to a safe place by entering:

1900<B800.BFFFM

4. Put in your slave disk and boot it by entering:

C600G

5. After the disk boots and the Applesoft prompt appears insert your Super IOB disk and save the RWTS to it by entering:

BSAVE RWTS.CONTINENTAL PRESS, A$1900, L$800

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

CONTROLLER

```
1000 REM "CONTINENTAL PRESS
1010 TK = 3:ST = 0:LT =
  35:CD = WR
1020 T1 = TK: GOSUB 490:
  GOSUB 360: ONERR GOTO 550
1030 GOSUB 430: GOSUB 100:ST
  = ST + 1: IF ST < DOS THEN
  1030
1040 IF BF THEN 1060
1050 ST = 0:TK = TK + 1: IF
  TK < LT THEN 1030
1060 GOSUB 490:TK = T1:ST =
  0: GOSUB 360
1070 GOSUB 430: GOSUB 100:ST
  = ST + 1: IF ST < DOS THEN
  1070
1080 ST = 0:TK = TK + 1: IF
  BF = 0 AND TK < LT THEN
  1070
1090 IF TK < LT THEN 1020
1100 HOME : PRINT "WE'RE◊ALL
  ◊THROUGH" : END
10010 IF PEEK (6400) < > 162
  THEN PRINT CHR$ (4) "BLOAD
  ◊RWTS.CONTINENTAL◊PRESS,
  A$1900"
```

Checksums

```
1000-$356B  1040-$6342  1080-$6CA2
1010-$3565  1050-$ABA3  1090-$9DCA
1020-$6170  1060-$20C0  1100-$18F0
1030-$7771  1070-$28C5 10010-$4E74
```

Softkey for...

Punctuation Skills End Marks, Semicolon, and Colon Punctuation Skills Commas Go to the Head of the Class Extra! Extra!

Milton Bradley

Requirements:
The original disk(s)
A blank initialized disk for each title
A blank initialized slave disk
Super IOB v1.5
A way to reset into the monitor

These titles can also be deprotected by using Super IOB with the Swap Controller and use the RWTS of the protected disk to read the original disk then use a normal RWTS to write the information back to your blank disk.

1. INITialize your blank disk(s)

INIT BOOT
DELETE BOOT

Note: If you are deprotecting Go To The Head Of The Class, or Extra! Extra! then do step 1a instead of step 1

1a. INITialize your blank disk(s)

INIT HELLO
DELETE HELLO

2. Boot your original disk and at the Applesoft prompt reset into the monitor.
3. Move the RWTS to a safe place by entering:

1900<B800.BFFFM

4. Put in your slave disk and boot it by entering:

C600G

5. After the disk boots and the Applesoft prompt appears insert your Super IOB disk and save the RWTS to it by entering:

BSAVE RWTS.MILTON BRADLEY, A$1900, L$800

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

CONTROLLER

```
1000 REM MILTON BRADLEY
1010 TK = 3:ST = 0:LT =
  35:CD = WR
1020 T1 = TK: GOSUB 490:
  GOSUB 360: ONERR GOTO 550
1030 GOSUB 430: GOSUB 100:ST
  = ST + 1: IF ST < DOS THEN
  1030
1040 IF BF THEN 1060
1050 ST = 0:TK = TK + 1: IF
  TK < LT THEN 1030
1060 GOSUB 490:TK = T1:ST =
  0: GOSUB 360
1070 GOSUB 430: GOSUB 100:ST
  = ST + 1: IF ST < DOS THEN
  1070
1080 ST = 0:TK = TK + 1: IF
  BF = 0 AND TK < LT THEN
  1070
1090 IF TK < LT THEN 1020
1100 HOME : PRINT "BANG!◊
  BANG!◊PROTECTED◊DISK,◊
  YOU'RE◊DEAD" : END
10010 IF PEEK (6400) < > 162
  THEN PRINT CHR$ (4) "BLOAD
  ◊RWTS.MILTON◊BRADLEY,
  A$1900"
```

Checksums

```
1000-$356B  1040-$6342  1080-$6CA2
1010-$3565  1050-$ABA3  1090-$9DCA
1020-$6170  1060-$20C0  1100-$E74F
1030-$7771  1070-$28C5 10010-$AAC6
```

Softkey for...

Superstar Ice Hockey

Mindscape

Requirements:
The original disk
A blank disk that has a notch on both sides or two blank disks
Super IOB v1.5
COPYA from your DOS 3.3 system master
A blank initialized slave disk with a deleted HELLO program
A way to reset into the monitor

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

POKE 47426,24 *ignore checksums and epilogs*
RUN COPYA

2. Copy side 2 of your original disk and put it aside we will make some changes in it later.

3. INITialize a blank disk.

CALL-151 *gets you into the monitor*
BE42:34 *allows a binary boot file*
3D0G *gets you back to Applesoft*
INIT LOADER, V029
DELETE LOADER

The INIT command formats your blank disk to boot a file named LOADER and gives it a volume number of 029. This volume number is needed because several of the files check for this volume number and the program will crash if the volume number is different. Sector edits could be made to override this check but this way works fine.)

4. Boot side 1 of your original disk and at the Applesoft prompt reset into the monitor.

5. Move the RWTS to a safe place by entering:

1900<B800.BFFFM

6. Put in your slave disk and boot it by entering:

C600G

7. After the disk boots and the Applesoft prompt appears insert your Super IOB disk and save the RWTS to it by entering:

BSAVE RWTS.SUPERSTAR ICE HOCKEY, A$1900, L$800

8. Install the controller into Super IOB, run it and copy side one of your original disk to your blank disk. Answer NO when asked if you want to INITialize the blank disk.

9. When the controller is finished with side 1, and you have the Applesoft prompt, enter RUN and copy side 2 of your original disk to the COPYA copy you made earlier. Answer NO when asked if you want to INITialize the disk.

CONTROLLER

```
1000 REM SUPERSTAR ICE
  HOCKEY
1010 TK = 3:ST = 0:LT =
  35:CD = WR
1020 T1 = TK: GOSUB 490:
  GOSUB 360: ONERR GOTO 550
1030 GOSUB 430: GOSUB 100:ST
  = ST + 1: IF ST < DOS THEN
  1030
1040 IF BF THEN 1060
1050 ST = 0:TK = TK + 1: IF
  TK < LT THEN 1030
1060 GOSUB 490:TK = T1:ST =
  0: GOSUB 360
1070 GOSUB 430: GOSUB 100:ST
  = ST + 1: IF ST < DOS THEN
  1070
1080 ST = 0:TK = TK + 1: IF
  BF = 0 AND TK < LT THEN
  1070
1090 IF TK < LT THEN 1020
1100 HOME : PRINT
  "WE'RE◊ALL◊THROUGH" : END
10010 IF PEEK (6400) < > 162
  THEN PRINT CHR$ (4) "BLOAD
  ◊RWTS.SUPERSTAR◊ICE◊HOCKEY,
  A$1900"
```

Checksums

```
1000-$356B  1040-$6342  1080-$6CA2
1010-$3565  1050-$ABA3  1090-$9DCA
1020-$6170  1060-$20C0  1100-$18F0
1030-$7771  1070-$28C5 10010-$0011
```

Softkey for...

Mrs. Wigglesworth's Secret
The Case of the Missing Chick
Mystery of the Witch's Shoes

Troll Associates

Requirements:
The original disk(s)
1 blank side for each title
Copy II Plus

The protection on these disks consists of a bad track and the boot program checking for that track.

1. Fast copy the original and ignore a read error on track $03.

2. Use Copy II Plus CHANGE BOOT PROGRAM option to make the following change;

Mrs. Wigglesworth's Secret: Change boot program to MENU.

The Case of the Missing Chick: Change boot program to U.

Mystery of the Witch's Shoes: Change boot program to MENU.

As an alternative to changing the boot program you can scan the disk for the bytes E4 73 7B and change them to 15 2F 00. I know this works for Witch's Shoes and although I didn't try it on the other 2 titles it should work on them also.

Softkey for...

Sea Speller

Fisher Price

Requirements:
The original disk
A blank disk
Any fast copy program that can ignore errors

1. Fast copy the original and ignore read errors. On my copy they were on tracks 1F, 20, & 21.

That's all there is to that.

Softkey for...

The Skeletal System

Brainbank

Requirements:
The original Skeletal System disk
A blank disk
DOS 3.3 system master
Any file copy program

This disk is in normal format except for track 3. None of the files shown in the catalog are using the protected track but 2 of the files check this track, they are SSPROT$$A and SSPROT$$1. Once track 3 is read you then get a menu on the screen. I was not able to find this menu on the disk and I must assume that it is on the protected track. To get the disk into a normal format we must copy the needed files onto a blank INITialized disk and then add a file to give you the screen menu.

1. Boot your DOS 3.3 system disk and at the] prompt put your blank disk in the drive and enter:

NEW
INIT HELLO
DELETE HELLO

2. Type in this Hello program.

HELLO

```
1 REM "HELLO BRAINBANK
5 READ N: DIM S$(N),P$(N):
  FOR X = 1 TO N: READ
  S$(X),P$(X): NEXT
10 TEXT : HOME : HTAB 14:
  PRINT "BRAINBANK◊INC."
20 HTAB 5: PRINT "***◊TABLE◊
  OF◊CONTENTS◊(MENU)◊***"
30 FOR A = 1 TO 40: PRINT "-
  " ;: NEXT : PRINT : PRINT
40 VTAB 5: HTAB 12: PRINT
  "THE◊SKELETAL◊SYSTEM
50 VTAB 8: FOR X = 1 TO N:
  PRINT S$(X);: FOR A = 1 TO
  39 - LEN (S$(X)): PRINT
  "." ;: NEXT : PRINT X:
  NEXT
60 VTAB 19: INVERSE : FOR X
  = 1 TO 120: PRINT "◊" ;:
  NEXT
70 VTAB 20: PRINT "◊◊SELECT◊
  A◊LESSON◊BY◊NUMBER◊" ;:
  NORMAL : GET A$: PRINT
  A$:A = VAL (A$): IF A < 1
  OR A > N THEN PRINT CHR$
  (7): GOTO 60
80 PRINT CHR$(4)"RUN" P$(A)
90 END
1000 DATA 5
1005 DATA "A◊BONE◊TO◊PICK" ,
  "BTP"
1010 DATA "MAJOR◊SKELETAL◊
  BONES" , "MSB1"
1020 DATA "JOINTS" , "JOI/1"
1030 DATA "LIGAMENTS◊AND◊
  CARTILAGE" , "LG+CA"
1040 DATA "REVIEW◊TEST" ,
  "REV"
```

Checksums

```
 1-$97CE   50-$05C9 1005-$8450
 5-$9E27   60-$182B 1010-$1D03
10-$E7E5   70-$DE90 1020-$DD25
20-$E29E   80-$1FCC 1030-$5624
30-$7C9E   90-$EC22 1040-$AEA3
40-$AF91 1000-$17F4
```

SAVE HELLO

3. Using your file copy program, copy the following files from your original disk to your initialized disk that you just saved the HELLO program to.

BTP
MSB1
MSB2
JOI/1
JOI/2
LG+CA.1
LG+CA.2
REV

That's it.

Softkey for...

Multiplication Puzzles
Quotient Quest
Book Worm
Early Addition
Circus Math

MECC

Requirements:
The original MECC disk(s)
Blank initialized disk(s) for each title
A blank initialized slave disk
Super IOB v1.5
A way to reset into the monitor

To deprotect these titles we will use Super IOB with the Swap Controller and use the RWTS of the protected disk to read the original disk then use a normal RWTS to write the information back to your blank disk.

1. INITialize your blank disk(s)

INIT HELLO
DELETE HELLO

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

3. Move the RWTS to a safe place by entering:

1900<B800.BFFFM

4. Put in your slave disk and enter:

C600G

5. After the disk boots and the Applesoft prompt appears insert your Super IOB disk and save the RWTS to it by entering:

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

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

CONTROLLER

```
1000 REM "MECC
1010 TK = 3:ST = 0:LT =
  35:CD = WR
1020 T1 = TK: GOSUB 490:
  GOSUB 360: ONERR GOTO 550
1030 GOSUB 430: GOSUB 100:ST
  = ST + 1: IF ST < DOS THEN
  1030
1040 IF BF THEN 1060
1050 ST = 0:TK = TK + 1: IF
  TK < LT THEN 1030
```

```
1060 GOSUB 490:TK = T1:ST =
  0: GOSUB 360
1070 GOSUB 430: GOSUB 100:ST
  = ST + 1: IF ST < DOS THEN
  1070
1080 ST = 0:TK = TK + 1: IF
  BF = 0 AND TK < LT THEN
  1070
1090 IF TK < LT THEN 1020
1100 HOME : PRINT
  "COPY◊DONE" : END
10010 IF PEEK (6400) < > 162
  THEN PRINT CHR$ (4)
  "BLOAD◊RWTS.MECC,A$1900"
```

Checksums

```
1000-$356B 1040-$6342 1080-$6CA2
1010-$3565 1050-$ABA3 1090-$9DCA
1020-$6170 1060-$20C0 1100-$9A4D
1030-$7771 1070-$28C5 10010-$24A9
```

Softkey for...

Comparison Kitchen

DLM Software

Requirements:
The original disk
A blank disk
A sector editor with scan capability

Thanks to Nipper for his softkey in issue #44 on page 11 this was deprotected quickly.

1. Fast copy your original disk.
2. Boot your sector editor and search for the byte string BD 89 C0 A9 56 and change the BD to 60.
3. If you want to be able to catalog the disk with Copy II Plus sector edit track $11, sector $00, byte $01 from 11 to 03.

Remember to write the sector back to the disk.

Softkey for...

Paint with Words
Trivia Machine

MECC

Requirements:
The original MECC disk(s)
2 blank initialized disks for each title
A blank initialized slave disk
Super IOB v1.5
A way to reset into the monitor

To deprotect these titles we will use Super IOB with the Swap Controller and use the RWTS of the protected disk to read the original disk then use a normal RWTS to write the information back to your blank disk.

1. INITialize your blank disks
INIT HELLO
DELETE HELLO
2. Boot your original disk and at the Applesoft prompt reset into the monitor.
3. Move the RWTS to a safe place by entering:
1900<B800.BFFFM
4. Put in your slave disk and enter:
C600G
5. After the disk boots and the Applesoft prompt appears insert your Super IOB disk and save the RWTS to it by entering:
BSAVE RWTS.MECC, A$1900, L$800
6. Install the controller into Super IOB, run it and copy your original disk to your blank disk. Answer NO when asked if you want to INITialize the blank disk.

Note: You can use the captured RWTS from the first disk/side of each title to deprotect the second disk/side, just redo step 1 and 6.

CONTROLLER

```
1000 REM "MECC
1010 TK = 3:ST = 0:LT =
  35:CD = WR
1020 T1 = TK: GOSUB 490:
  GOSUB 360: ONERR GOTO 550
1030 GOSUB 430: GOSUB 100:ST
  = ST + 1: IF ST < DOS THEN
  1030
1040 IF BF THEN 1060
1050 ST = 0:TK = TK + 1: IF
  TK < LT THEN 1030
1060 GOSUB 490:TK = T1:ST =
  0: GOSUB 360
1070 GOSUB 430: GOSUB 100:ST
  = ST + 1: IF ST < DOS THEN
  1070
1080 ST = 0:TK = TK + 1: IF
  BF = 0 AND TK < LT THEN
  1070
1090 IF TK < LT THEN 1020
1100 HOME : PRINT
  "COPY◊DONE" : END
10010 IF PEEK (6400) < > 162
  THEN PRINT CHR$ (4)
  "BLOAD◊RWTS.MECC,A$1900"
```

Checksums

```
1000-$356B 1040-$6342 1080-$6CA2
1010-$3565 1050-$ABA3 1090-$9DCA
1020-$6170 1060-$20C0 1100-$9A4D
1030-$7771 1070-$28C5 10010-$24A9
```

Softkey for...

Money Works

MECC

Requirements:
The original disk
A blank disk
DOS 3.3 system disk
Any ProDOS 8 disk with a normal ProDOS file
Any file copy program
Any sector editor

1. Boot your DOS 3.3 system disk and at the] prompt enter:
POKE 47426,24 *ignore checksum and epilogs*
RUN COPYA
2. Copy the original disk to your blank disk.
3. Boot your sector editor and make the following changes.

Trk	Sct	Byte	From	To
09	0C	D3-D7	90 03 4C ??	18 EA EA EA EA

4. Write the sector back to the disk.
5. Boot your file copy program, delete the ProDOS file from your copy and copy any normal ProDOS 8 file to your copy.

Softkey for...

Magic Candle

Mindcraft

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

This program uses a password protection but only when you want to restore a saved game. After using the following softkey all you will have to do is press RETURN when asked for the password.

1. Fast copy all four sides of your original disks to your blank sides.
2. Make the following sector edits to side one of you copy.

Trk	Sct	Byte	From	To
$04	$00	$13-19	20 87 E0 C9	EA EA EA EA
			FF F0 07	EA EA EA
		$1C-1E	DD 72 6F	4C 32 69

4. Write the sector back to the disk.

Softkey for...

Milt's Math Drills
Cause & Effect
Fact or Opinion
Figurative Language
Analogies Tutorial

Hartley Courseware

Requirements:
The original disk(s)
A blank initialized disk(s) for each title
A blank initialized slave disk
Super IOB v1.5
A way to reset into the monitor

These Hartley Courseware titles can also be deprotected by using Super IOB with the Swap Controller and use the RWTS of the protected disk to read the original disk then use a normal RWTS to write the information back to your blank disk.

1. INITialize your blank disk(s)
INIT HELLO
DELETE HELLO
2. Boot your original disk and at the Applesoft prompt reset into the monitor.
3. Move the RWTS to a safe place by entering:
1900<B800.BFFFM
4. Put in your slave disk and boot it by entering:
C600G
5. After the disk boots and the Applesoft prompt appears insert your Super IOB disk and save the RWTS to it by entering:
BSAVE RWTS.HARTLEY COURSEWARE, A$1900, L$800
6. Install the controller into Super IOB, run it and copy your original disk to your blank disk. Answer NO when asked if you want to INITialize the blank disk.

CONTROLLER

```
1000 REM HARTLEY COURSEWARE
1010 TK = 3:ST = 0:LT =
  35:CD = WR
1020 T1 = TK: GOSUB 490:
  GOSUB 360: ONERR GOTO 550
1030 GOSUB 430: GOSUB 100:ST
  = ST + 1: IF ST < DOS THEN
  1030
1040 IF BF THEN 1060
1050 ST = 0:TK = TK + 1: IF
  TK < LT THEN 1030
1060 GOSUB 490:TK = T1:ST =
  0: GOSUB 360
1070 GOSUB 430: GOSUB 100:ST
  = ST + 1: IF ST < DOS THEN
  1070
1080 ST = 0:TK = TK + 1: IF
  BF = 0 AND TK < LT THEN
  1070
1090 IF TK < LT THEN 1020
1100 HOME : PRINT "DONE'" :
  END
10010 IF PEEK (6400) < > 162
  THEN PRINT CHR$ (4) "BLOAD
  ◊RWTS.HARTLEY◊COURSEWARE,
  A$1900"
```

Checksums

```
1000-$356B 1040-$6342 1080-$6CA2
1010-$3565 1050-$ABA3 1090-$9DCA
1020-$6170 1060-$20C0 1100-$041A
1030-$7771 1070-$28C5 10010-$453B
```

Softkey for...

Medalists: Presidents
Medalists: Create Your Own
Who, What, When, Where

Hartley Courseware

Softkey for...

Word Scrambler and Spelling Tutor

Avant-Garde

Softkey for...

Arithmetic Facts Learning Aid

???

Softkey for...

Introductory Genetics

EME

Softkey for...

SAT Score Improvement System
Algebra
SAT Score Improvement System
Geometry

Hayden Book Company

Requirements:
Original disk(s)
A blank disk(s) for each title
Demuffin Plus
DOS 3.3 system master
A way to reset into the monitor

These titles can be deprotected by using Demuffin Plus and the RWTS of the protected disk to read the files on the original disk then write the information back to your blank disk.

1. Boot your system master and at the Applesoft prompt put in your blank disk and enter:
INIT HELLO
DELETE HELLO
2. Boot your original disk and reset into the monitor after the Applesoft prompt appears.

```
1070 GOSUB 430: GOSUB 100:ST
  = ST + 1: IF ST < DOS THEN
  1070
1080 ST = 0:TK = TK + 1: IF
  BF = 0 AND TK < LT THEN
  1070
1090 IF TK < LT THEN 1020
```

3. Move the RWTS to a safe place, so it won't be destroyed when you boot your slave disk, by entering:
6800<B800.BFFFM
4. Boot your slave disk
C600G

5. Put in your Demuffin Plus disk and enter

CALL-151 *gets you into the monitor*
BLOAD DEMUFFIN PLUS,A$803
FF59G *if you hear a beep ignore it*
B800<6800.6FFFM *moves the protected RWTS back to its original location*
A851G *reconnects DOS*
803G *starts Demuffin Plus*

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

Rich Etarip — WI

Does anyone have an original disk of Fraktured Faebles from American Eagle Software or a solution to the game? It seems that I have done everything possible in this game and still cannot solve the puzzle.

Romualds Boreiko — Canada

Does anyone know how to circumvent the hardware plug protection on the MSDOS program "Superworks" by Remarkable Technologies? It is an AppleWorks clone for IBM/compatibles. I want to use it at home to transfer data from AppleWorks to Superworks for later use at work. Carrying the plug around is too inconvenient.

Ron Powers — WI

I need help from M. M. McFadden who did the PDOS article in issue #85. I would like to know if it is possible to convert "Childrens Writing and Publishing Center" by the Learning Company from RDOS to ProDOS so that it will run on a hard drive.

I run a Digicard Networked computer lab where we have plenty of the above program but they crash almost daily. The Learning Company replaces the crashed disks promptly within two months for only $39.95 each. This is a problem that I desperately need to solve. I would appreciate any help.

Krakowicz — NY

The Basics of Kracking Part #14

Softkey for...

Way Out

?

After the excellent and challenging protection that Sirius put on the BANDITS/CYCLOD group, it was discouraging to see the putrid little DOS command change on ESCAPE FROM RUNGISTAN. WAY OUT is about halfway between the two, with enough challenge to make it interesting, and enough disk access to make it different.

In the first half of this episode, we will describe the removal of the nibble counts from the disk to make it copy with NA II, and in part B we'll cover the conversion of the program to a totally COPYA version.

Track 0, sector 0 loads, of course, into $800-$8FF, and brings in a fairly straightforward loader from the rest of track 0 into $9600 up. They put it there rather the $400-$7FF screen memory in order to do the ripple visual effect banner (that's all in Lo-Res color, by the way). The loader is visible when you reset during the loooong boot (they still read in all the tracks from $0 to $1C to "check your Apple"), and checking the end of the boot sector at $890 shows that the starting location in the loader is $979B. A short routine reads through all the tracks, loading them at starting addresses taken from a lookup table just like BANDITS and CYCLOD. Following that, at $9811 and $9814 are JSR's to different nibble count routines for tracks $21 and $22. In this first part, we will make the disk copy with NA II by changing the six bytes for the two JSR'S to NOP's. But before we do that, let's take a minute to look at the copy protection schemes on these two tracks. Track $21 has a good, old fashioned nibble count where they determine the number of bytes between the two occurrences of "AA" on the track. This is the kind of count that NA II eats for breakfast, so it's not hard to get around. Track $22, on the other hand, shows that SIRIUS has been reading the DOCS on the major nibble copiers - we sure hope they bought them all, right? In order to do a nibble count, a copier has to know where to start counting and sometimes where to add or delete the spare nibbles. To do this, NA II allows you to enter an 8-byte address marker, while LS 4.1 allows 9 bytes to include a normal 3-byte header, vol#, track#, and sector# at two bytes each. This track has several sections with normal "gaps" just like NA and LS love to find, all beginning with the byte sequence $AA, $D5, $D5, $FF, $D6, $FF, $FD, $FD, $DD. The program, however, looks for the next three bytes as well, and these must be $EA, $B5, $F7. All but one of these 9-bit sequences have other bytes for the next three, and these will be incorrectly chosen for the address marker by any of the popular copiers. The entire track is read 16 times, and the checksum for the 64K bytes read in must agree with the one in the program, or the disk reboots. Devious enough, but quite visible in a loader that wasn't well hidden.

"As a general rule, searching for a two-byte sequence in a program is risky, while a four-byte sequence is pretty safe."

To change those nibble count JSR's to NOP'S, we have to alter the actual nibbles on the track. Any alteration will change the checksum for the track, so we first have to negate the checksum comparison routine. The same process is used for the actual removal of the nibble count, so we'll do the easy one first.

It's been a while since we looked at the technique used by SIRIUS to encode information on the disk, so let's review for a minute. Remember that most protected SIRIUS software does not use regular sectors, but an unsegmented stream equivalent to $C00 bytes of data on each track. After the address marker of "AD DA DD" (the Sirius trademark), every byte is encoded in a 4+4 format where half the information is stored in each nibble (a brief aside - the use of the term "nibble" is confusing and a little bit erroneous when used in describing disk access. It formally refers to either the left-hand or right-hand four bits of a byte, and has been continued in usage for the units of information storage on a disk, even though many schemes, like DOS 3.3, use a very different method of encoding the 8 bits of a byte onto a disk "nibble." In almost all cases, on the Apple, information is recovered from the disk in a series of eight-bit bytes which then must be further processed to decode the real binary information contained in them).

The full sequence of instructions which perform the decoding was listed in "The Basics of Kracking part #1"; but briefly, the first nibble (byte) is read in, the carry bit is set, and the result is rotated left once. This shifted nibble is "ANDed" with the next nibble, and the result stored in memory as a full byte. In order to change a byte on the track, it's necessary to reconstruct the nibbles as they will appear on the track and find them with a nibble editor. For example, to find the bytes which correspond to the checksum routine, we need to look at the instructions at $9887. They are "EOR $F5, BNE $988D," or branch to a re-read routine if the exclusive-or between the accumulator and the checksum in location $F5 is not zero. We can get around this re-read if we change the bytes for "BNE $988D " from "D0 02 " to two NOP's: "EA EA".

The data nibbles allowed on the disk under this system must have the most significant bit set, and at least every second bit set to one: the only valid nibbles are A (1010), B (1011), E (1110), and F(1111). Sparing the very gory details, a byte has its first half in one track nibble, and its second half in the next:

```
     -----SECOND BYTE
      /  /
    EA FA
   /  /
 ---------FIRST BYTE
```

The table below is used to "build up" the SIRIUS-format track nibbles:

Byte	1st half	2nd half
0	A	A
1	A	B
2	B	A
3	B	B
4	A	E
5	A	F
6	B	E
7	B	F
8	E	A
9	E	B
A	F	A
B	F	B
C	E	E
D	E	F
E	F	E
F	F	F

To build up "D0", for example, use E- F- for the "D" and -A -A for the zero, then combine them to give "EA FA" for "D0 ". The "02 " byte is then A- A- plus -B -A to make AB AA. The complete nibble string for "D0 02" is "EA FA AB AA."

To do the nibble editing that follows, the best utility is probably the track/bit editor of NIBBLES AWAY II. Load NA II, enter D5 AA 96 for the address marker, select the track editor and read in track zero. Type "Z" to allow the program to analyze the track, then move the cursor to the page containing the pointer (usually 6700). Type "S" for string search and enter "EA FA AB AA" (As a general rule, searching for a two-byte sequence in a program is risky, while a four-byte sequence is pretty safe. In this case, you really should add the preceding two bytes $45 $F5, which translate to "BA EF FA FF"). When this string is located, replace it with the equivalent of two EA's: "FF EA FF EA", and write it to a blank disk with the "W" key.

With the checksum safely removed, you can follow the same general procedure to remove the nibble count JSR's at $9811 and $9814, allowing you to make a working copy of WAY OUT with NA II. Track zero would use "D5 AA 96" as an address marker, and tracks $1-$1C use "AD DA DD."

A COPYA-able Copy

This part of the Korner is devoted to making WAY OUT (and hopefully similar games in the future) COPYAable. WAY OUT is structured in the following way: it has a main program split between $800-$1FFF and $6000-$9BFF; and two hi-res pictures (start game and saved game) which load at different times into $4000-$5FFF. Track $1B contains best scores and initials, and track $1C contains information for the saved game. Both of these tracks are loaded into $A000-$ABFF and the crucial information relocated to some slots at $1A00-$1C34. The data for the 26 mazes are stored two to a track in tracks $1-$D; these are also loaded into the $A000 space for transfer to $1A00 and up. Fortunately, there is room in memory for the RWTS routines ($900 hex), and the individual read and write subroutines will fit easily into the space of the original ones.

The easiest way to get the main program loaded in is as a single file, using the routine built into the DOS boot. Doing it this way saves some programming time, and speeds the load, since no separate load is needed for the appropriate picture and saved game. This main program is a total of $A4 (164) sectors, running from $800 to $ABFF. A good way to set this up is to boot a DOS 3.3 disk before you boot the game, and hit reset after the game is completely loaded (this assumes that you have a non-autostart ROM in the F8 socket). RWTS will still be intact at $B700-$BFFF, and you can write the entire program onto an initialized disk with the Inspector (the Inspector in ROM at $D800, preferably with Watson at $D000, is an absolute must for efficient Kracking of today's software). Remember to change locations $3D9-$3DB to "4C 00 BD" to allow the Inspector to find RWTS, then write the program onto the disk using control-W, control-I-repeat, onto track $E, sector 0 to track $18, sector 3.

The 13 data tracks that comprise the mazes should next be transferred to

tracks $1-$D of the new disk. Locations $988F-$98AB of the original loader contain the table of starting addresses for each track. Use the nibble alteration scheme discussed in part to alter the locations so that each track loads into an even 1000 address—T1 to $1000, T2 to $2000, etc., up to T8 at $8000. Also change location $980E to $1C so the load will end after the game tracks are in. When you boot the game disk with these altered locations, the game tracks will load obediently where they're told. Save these onto the same tracks on the DOS 3.3 disk with the Inspector, then go back and do tracks $9-$D by altering their load locations and saving them. The saved game picture can be saved out similarly by resetting after restarting the saved game. Save the picture anywhere safe; tracks $1F and $20 are ok. Your DOS disk now contains all the data for the game, and all you need are a few quick read and write subroutines.

To use the DOS boot routine to load the big part, read in T0, S1 from a standard DOS 3.3 disk. Make the following changes, and write it back out to your disk:

Location	Meaning	New value
$15	First track	$18
$1A	First sector	$03
$E0	# of sectors	$A4
$E7	First storage page+1	$AC

When the disk is booted, stage 1 thinks it's loading in DOS stage 2, but it's really your program.

To do the rest of the disk access, the following routines from the original must be duplicated for the RWTS format:

Old track #	New Track/Sector	Content	Function
$1B	$18/$4-$18/$F	Scores	Read & Write
$1C	$17/$8-$18/$3	Saved Data	Read & Write
$15-$17	$19/$0-$20/$F	Saved Hires Picture	Read & Write
$1 to $D	$1/$0-$D/$0	Game Data	Read only

To use RWTS, the following numbers must be loaded into it (computer science majors call this "parameter passing").

Location	Contents
$B715	Starting(highest) track#
$B71A	Starting sector
$B726	0=seek, 1=read, 2=write
$B70E	# of Sectors/Pages
$B7E7	First mem. page load+1

So that reading data from T17,S8 through T18,S3 into $A000 to $ABFF requires:

```
B715:18
B71A:03
B726:01
B7E0:0C
B7E7:AC followed by JSR $B700
```

You can scatter the necessary "stuff and jump" routines between $9600 and $9800. The nicely-organized jump table at $9600-$961E will tell you where each one should be, and allows the rest of the program to use them without knowing they've been changed.

One further change that's required is the routine to calculate the game track to be read in. An input routine deep in the bowels of the main program accepts the keypress, qualifies it, and subtracts $C1 to give $0-$19 for the letters A-Z. The code at $962C which does the calculation their way is:

```
LDA $9623
AND #$FE
CLC
ADC #$02
JSR 981A
```

Track access in the Sirius system is listed in half-tracks, so all track numbers are doubled in the code. They take the maze number 0-19 and mask off the low bit, since both even and odd maze numbers will be on the same track. they add 2 since the first maze track is #1, and jump to the track reader. In our system, this becomes:

```
LDA $9623
LSR
CLC
ADC #$1
JSR 9800
```

We shift the number right once to divide it by two and include the even/odd game, then add 1 to get the whole track number for RWTS.

About all that's left is to put a little bit of flash on the title page, and you have a nicely packaged COPYA version of WAY OUT.

A footnote—in an incredible exercise of stupidity, SIRIUS left in a fair part of the assembler source file for the protection scheme employed. If you read through the memory at $C00-$1FFF, you will find large chunks of an ASCII file with such gems as "JSR NBLCNT", etc. You can also see it by loading and resetting the program, then typing the monitor commands 400<C00.FFFM or 400<1000.13FFM, and so on. These will put the file on the screen for your perusal. This reminds me of locking your valuables in a safe and then writing the combination on the door! The protection scheme, by the way, was written by Zero Page Enterprises, which has no connection whatever with the well-known Krackist of the same name.

Ephraim Santiago — IL

Does anyone know how to get more airplanes, bombs, torpedoes, and rockets out of Wings of Fury for the Apple IIe. I have tried various softkeys with no luck. (If you do have any methods please submit it to Computist.) Why shouldn't the crippled carrier your protecting have anti-aircraft weapons like the other cruisers your trying to destroy?

I think it's time Broderbund releases a new version of Wings of Fury 5.25" or 3.5" disk for the Apple IIe 128k which makes use of expanded memory. With anti-aircraft weapons and 30 Hellcats with (speed) on board and maybe some NUCLEAR Weapons. Also why not a modern Wings of Fury, (F-16 Tomcats, Harrier Jets, AWACS surveillance, etc) lets get a little creative with quality sound, 3D graphics, (Hi-Res)., saving and restoring games options and on a 3.5 disk? Why not? Oh Yeah, leave out the !@#$on disk-protection.

I need help with Country Combo (5.25" Disk x1, Apple II Copyright 1982 Vers 1.0 by Micro Power & Light Co.

This program seems to be written in BASIC with three files. I can't catalog the disk with Copy II Plus. I can only catalog the disk after I boot it up and break out of the program by pressing control-reset. I'll get the apple-soft prompt and this is when I catalog the disk. I've tried CopyA, CopyA+, Locksmith, and other copy methods with no luck. I believe it's just a DOS alteration because, when I catalog the disk with CopyIIplus I get an error on track $11, sector $0. I have used CopyA+, CopyA, and Locksmith with no success.

I also need help with Where In The USA Is Carmen SanDiego? (1986) by Broderbund Software for Apple II+, IIe or IIc, one 5.25" disk double-sided

I have seen many softkeys for Carmen USA but, not one for the version I own. My Carmen Version is just one disk which boots on side A: and after being assigned a case the program asks you to turn the disk over to side B: so that it may continue the game. I have used CopyIIPlus parms to make backups (which weren't reliable most of the times) with little success. The label is dark blue in color and at the bottom right corner are the following symbols, (APDSK 63). How about a shot at this one? Any takers?

Softkey for...

Mastery Arithmetic Games (1989)

Mastery Development

Requirements:
CopyA
Blank disks
CopyII Plus (sector editor)

This program (for Apple IIe 128k-DOS 3.3) I received in July of 90, as a demo program which contains five games on disk. After several sessions of playing (booting the game) you get a message that says you cannot use the disk any longer, that you should purchase a non-demo program. I was amazed at how they inserted this neat little trick that would fool you into discarding a perfectly good disk, so I decided to look into the program and do away with Mastery Deception, (just a joke).

Disk protection is a simple format alteration between D5 AA 96 and D4 AA 96 and invalid data checksums are used.

RUN COPYA

Press ctrl C when it prompts for source disk location

(Always Write Protect original disk)

POKE 47426,24 *ignores checksum errors*
POKE 47444,41 *ignores address prolog byte*
POKE 47445,0
70 *delete line 70*
RUN *restarts Program*

(Make about three copies and put away original demo program.)

Load file "MAGD.HELLO". List MAGD.HELLO and change line 30 to read as follows:

```
30 PRINT CHR$ (4)"BRUN M.A.
   GAMES.MENU"
```

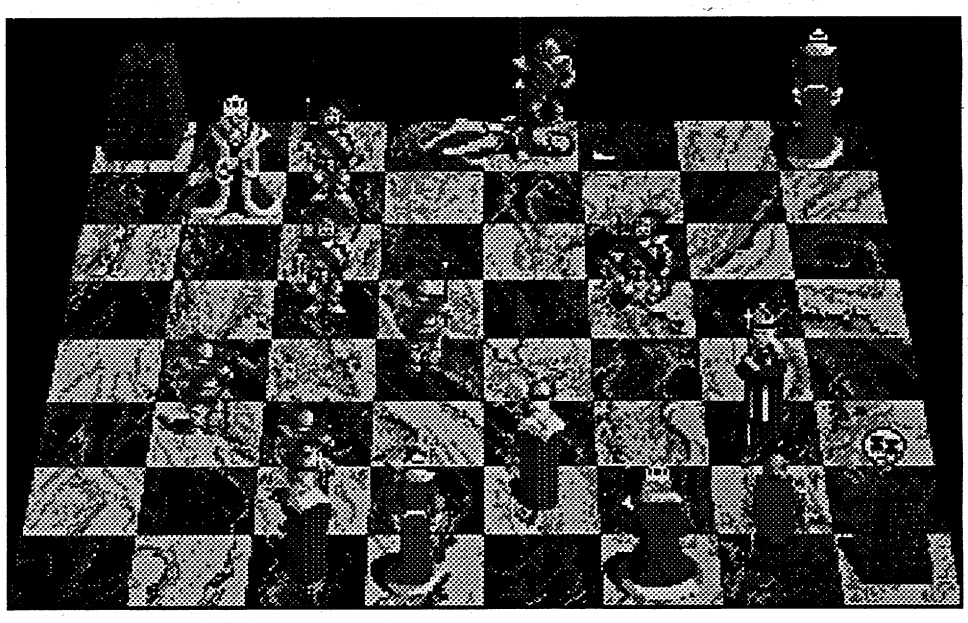
(No period after MENU.) SAVE as MAGD.HELLO. That's it! You should know have a deprotected copy that you can back up without any problems.

Note: Mastery Development used Lazor Systems Interactive Symbolic Assembler, (c) 1979 Lazor Systems, Version 1.5c., to construct this program?

By the way Mastery Development 1990., has two new programs out called, Math Facts Tracker and Geo-Race U.S.A., these two are great educational games. I used the demo versions (copy-protected of course) and have since sent out my purchased of these two educational games.

I tried backing-up Catalyst 3.0 (Apple IIe, 3.5 disk 1982-85, Quark Inc.) with CopyIIplus 9.0 parms and had no luck. One thing I notice when I use the parm is that the ProDOS file is never copied onto the target disk. When I boot the target disk I get the following message, "Unable to load ProDOS." The program recognized my extra memory and loads all the files onto it except ProDOS? I know there was a crack for it in one of the earlier issues but, I don't have this early issue so, I was wondering if you can print it again.

Thanks to (alias) "No Balls Russell" for his hard efforts in backing up Indy and Turtles.



Robin Locksley — MO

Placing Battle Chess on a Hard Drive

Requirements:
Apple IIGS
System 5.04

I have been trying to get Battle Chess on the HD for a long time, but without success. Then one day, purely by accident I noticed that some ProDOS 8 programs required a Basic System file to operate. So naturally I tried adding one. What do you know — success. This is what worked for me.

1. Copy Battle Chess to the Hard Drive
2. From inside the BC folder, delete the ProDOS file
3. Add the BASIC.SYSTEM file from your system disk
4. Launch the game from the Chess .Finder Icon

Notes: Before I loaded BC to my hard drive, I by-passed the word check copy protection (Computist #73). This program is on the second partition of my hard drive.

Put PaintWorks Gold on a hard drive?

I've sort of managed to get PWG on the hard drive, but only by going through the back door. I have a 50 meg drive that is partitioned. Because of the incompatibility of PWG (ProDOS 16 v 1.3) and System 5.04, I pulled out PWG's system folder and placed it on the second partition and then placed the PWG folder on the same partition. When you launch PWG it loads PWG old finder, and you can continue to launch your program from there. I'd rather be able to load PWG through GS.OS but this is the best I can do. By the way this procedure also works for TrianGO.

@I am still trying to get King of Chicago and Hunt for Red October to load to the Hard Drive. If you have succeeded please write into Computist and let the rest of us know. Thanks.

Ephraim Santiago — IL

IBM Softkey for...

Indy! The Graphic Adventure

Lucas film Games

From 1990 Lucas Arts. Entertainment Company. For IBM & compatibles (80286+). Special VGA Version. Hard Disk Required 640k RAM. 1.2 MB(High Density) Disk. VGA Required.

You can't backup these four disk with diskcopy. I found the best way was to Install them to your hard drive and then copy the files from the hard drive to a newly formatted High Density disk, (formatting the disk at high density). Double density disk will not work.

That's it! Have fun.

IBM Softkey for...

Teenage Mutant Ninja Turtles

Ultra Games/Komani software, Inc.

For IBM PC & 100% Compatibles. 3.5 Disk Version 2.0 Joystick Recommended 512K EGA, CGA / Hercules For One Player, Version 2.0/disk1 #L840021-IBM PC Version 2.0/disk2 #L840022-IBM PC

"Always Write-Protect your original disk!"

Option 1:

Use CopyII PC and Bulk Erase disk, (new target disk). Use CopyII PC to back-up disk. (_ B: _ B:) > for one disk 5 1/4 or 3 1/2 disk drive.

Option 2:

If this doesn't work Install T.M.N.T. to your hard drive and then copy the files from your hard drive onto a newly formatted High Density Disks.

C:> Type INSTALL C: and press RETURN Or ENTER. You will be prompted to insert other disk when necessary. The INSTALL program will automatically create a sub-directory on your hard disk (H.Disk), called TMNT. When this function is completed, the computer will prompt you. (Sometimes this is a long process, so please be patient.)

To play the game, log C:> then type CD\TMNT. Finally, type PLAY into the sub-directory and start the game using the proper loading instructions.

To copy Key-Disk you must use a Thermo Machine and One Ditto Master sheet. (Thermo Machines are usually found in public schools.)

I've found T.M.N.T., not to work on some IBM clones. One reason being is that it may not be a true IBM clone, or selection of the wrong set-up when prompted by the on screen menu. MAYBE someone could find the cure for the T.M.N.T. blues.

Note: I talked with someone from marketing at Komani Software concerning T.M.N.T. for the Apple IIe, and IIgs line. I was told that T.M.N.T. was to be release but, that there was no market for the product? What !@#$hit.

IBM Softkey for...

Kings Quest III

Sierra On Line

Requirements:
Copy II PC
High Density Disks
Hard Drive

First try using DISKCOPY as this program is not supposed to be protected anymore, (so says Sierra). If diskcopy fails use options 1, and/or 2.

Option 1:

Use CopyII PC and Bulk Erase disk, (new target disk). Use CopyII PC to back-up disk. (_ B: _ B:) > for one 5.25" and/or 3.5" disk drive. (A: B:) for two disk drives 5.25" and/or 3.5".

Option 2:

If this doesn't work Install Kings Quest III to your hard drive and then copy the files from your hard drive onto a newly formatted High Density Disks.

C:> Type INSTALL and press RETURN or ENTER.

Answer the on screen questions using the up and down arrow keys to highlight your selections. You will be asked if you wish to install the game on your hard disk. If you do not wish the game to be installed on your hard disk, then press ESC (to skip this step). Otherwise enter the letter designation of your hard disk (usually C) and follow the prompts.

Please note: The install procedure will write a file named RESOURCE .CFG to disk 1. For the installation to be completed correctly, Disk 1 MUST NOT BE WRITE PROTECTED. No other files on disk 1 are written or changed by the INSTALL command.

Note: I called Sierra On Line (now called INTER-ACTION) and asked what happened to Police Quest II, for the Apple IIe? I was told that Sierra is dropping the Apple II line. Could this be true? I use an Enhanced IIe with two 5.25" and one 3.5" disk drive (s)., and I've installed a memory expansion card with 1meg,.(soon a 120 meg H.D.). Why can't Sierra develop software for the IIe's that takes advantage of such memory? Any answers?

Unknown -

IBM Softkey for...

Space Harrier

?

I tried to softkey HARRIER.EXE and found that in DEBUG it would hang up in some parts. So I decided to softkey the installation portion. When I finally unprotected INSTALL.EXE, I found that it creates two files DEMAA.COM and DEMAB.COM. Debugging the INSTALL. EXE and installing on my HD works great! The following are the steps required to softkey the INSTALL.EXE. This will give you 84 installs.

Use Norton Utilities to search a copy of Space Harrier Disk 1 for 8B E5 85 C0 74 0C and change the 74 to 75. Search for 8B E5 85 C0 75 0C and change the 75 to 74. Save the file and it is completed. Now you can run and install to your hearts content!

IBM Softkey for...

Heat Wave

Accolade

The following patch disables the "Nautical Exam" and makes the supplied code wheel an artifact. The changes make it so the program always asks for the same four digit entry, namely 9000, and it will even remind you of the number at the "Exam" screen. This patch works with the file HEATWAVE.EXE (79429 2-15-90 10:37a).

This procedure has you rename the file, use DEBUG to make the changes to it, save it, and then rename it back. Make sure you do this with a BACKUP copy and not with your original disk.

```
REN HEATWAVE.EXE HW.DAT
DEBUG HW.DAT
E 534
xxxx:0534  E8.B8 4A.2F 1D.00 4E.90
   75.90 FA.90
R DS
DS xxxx     the value of DS will vary
:yxxx       enter the value of DS + 1000
E 33BB
yxxx:33BB  79.20 6F.39 75.30 20.30
   73.30 65.20 65.20
W
Q
REN HW.DAT HEATWAVE.EXE
```

IBM Softkey for...

Hoverforce

?

Here's how to disable the protection check made when you start the game. Make sure and do this procedure on a BACKUP and not your original disk. The DOS program DEBUG must also be copied to the same disk and directory as your "HF" program or be available along your PATH.

```
REN V.EXE V.UNP
DEBUG V.UNP
E 2901 90 90 90 EB
W
Q
REN V.UNP V.EXE
REN E.EXE E.UNP
DEBUG E.UNP
E 2B9D 90 90 90
E 2BA2 EB
W
Q
REN E.UNP E.EXE
```

This patch worked with the E.EXE file dated 3-19-91 and 37,175 bytes in size and the V.EXE file dated 3-19-91 and 34,917 bytes in size.

IBM Softkey for...

Faces

?

To softkey FACES, I used PCtools. First you make a copy of the file FACES.EXE, like FACES2.EXE. Then use PCtools to find some of the questions that the program will ask, like WHAT WAS NAPOLEON BIRTHPLACE ?(PG 5) and so on. Then page down until you get to the last question.

You will then see only the first (4) four letter of the answers, like WILL AJAC MAMI WHIG SPRIN and so on.

You could put any (4) four letter word you like in place of the ones they use but do NOT change the SPACE you see between the word or you could use the spacebar to blank them out but do NOT use the spacebar for the space they put in the program as you will see the spacebar HEX is not the same. If you use the spacebar, and when the program ask for an input you will have to space over (5) five times then hit ENTER. I use LOAD as my (4) letter word.

I have the program on a 1.2M floppy disk. The file sector I started with was on 152. If you do a string search on PG this will give you a sector to look for. Then use the edit and GOTO SECTOR to save time.

IBM Softkey for...

Artwork

West End Film (v2.43)

1. First, make a copy of the original disk.
2. Search the file ARTWORK.EXE. (Note: all bytes are in hexadecimal.) Search for: A0 A2 19 30 E4. Change to: B8 61 00 30 E4. This forces ARTWORK to see the letter "a" of its signature, even if no "a" is there...
3. Search for: 80 FC 10 1F 58 75 03. Change to: 80 FC 10 1F 58 90 90. This causes ARTWORK to believe that the expected diskette error has occurred, even if it hasn't.
4. Search for: B4 3D CD 21 73 03. Change to: B8 02 00 90 90 90. This prevents a diskette check.
5. Search for: 8B 46 0A E8 7C 00. Change to: 8B 46 0A 90 90 90. This prevents one of the two accesses of the copy-protect tracks.
6. Search for: 8B 46 0A E8 1A 00. Change to: 8B 46 0A 90 90 90. Prevents second access of the copy-protect tracks.
7. Search for: 72 02 33 C0 C3. Change to: 90 90 33 C0 C3.
8. Using DEBUG, load the ORIGINAL copy of ARTWORK.EXE.
9. At the "dash" prompt, type:

```
G 8bd:9AA
G 9b1
G 8bd:9aa
G 9b1
```

This sequence causes ARTWORK to read in a signature from the protected tracks of the original disk.

10. Type: (where xxxx is the current contents of the BX register)

```
D DS:xxxx
```

11. Write down the byte pattern displayed!

On my copy, the pattern is: 4B 61 78 78 00 00 (=Kaxx). The "4B" is the signature of the graphics board which ARTWORK expects to see. The "61" is the letter "a", which says "I am a valid ARTWORK". This signature is for the Tecmar Graphics Master. If your copy was installed for a different board, the bytes given above will differ.

12. Remove original disk from drive A:.
13. Now quit DEBUG and return to Norton or some other disk utility.
14. Search the modified copy of ARTWORK.EXE (NOT the original) for: A0 A1 19 30 E4 and change to: B0 xx 90 30 E4. The "xx" stands for whatever the byte was in the signature string you wrote down. For me, xx was "4B".

Artwork is now unprotected. Have fun, kids!

unClassifieds

How to place an UnClassified Ad

Send a typed sample copy with appropriate instructions. (If possible, send text on a 5.25" Apple format disk.) Use up to 40 characters per line, we will adjust word wrap.

Special Graphics Instructions: The first three words of the first line are printed in bold for free. If you want other words bolded, use 5 characters less per line. Use 10 characters less per line if you have a lot of uppercase bold letters. Bold letters are wider than normal. If the typed copy does not show bold, circle the words you want bolded and, on the side, write BOLD. If you want a line centered, write CENTER next to that line. There is no charge for centering any line.

You must check your ad for errors, the first time it runs. Errors on our part will be corrected, then, for free. Errors or changes on your part will be charged a $5 processing fee.

★★ New Rates (per line) ★★

Computist club member ..... 25¢
All others ..... 35¢

The minimum order is $5.

- Our liability for errors or omissions is limited to the cost of the ad.
- We reserve the right to refuse any ad.
- Washington state residents add 7.8% sales tax.
- Send a check or money order (funds drawn on US bank only) for the entire amount to:

COMPUTIST unCLASSIFIEDS
33821 East Orville Road
Eatonville, WA 98328

WANTED

"Most Wanted List" Software

Need help to deprotect a disk?

Softkey hobbist is interested in acquiring copy protected software to deprotect. Good track record, many successful attempts. Original disk will be returned along with softkey for COMPUTIST. Especially interested in older software (pre-1988) but will give any disk a shot. I'm especially interested in:

Drol---Broderbund
Serpentine---Broderbund
Spare Change---Broderbund
Wings of Fury---Broderbund
Star Cruiser---Sirius
Space Eggs---Sirius
Falcons---Picadilly
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System: Apple IIe, 128K. Send disk to:

Rich Etarip
824 William Charles, Apt #2
Green Bay, WI 54304

Lode Runner Fun Club

1900 optional Lode Runner screens available for exchange with your original screens.

Toshikazi Yamamoto
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Tokyo 171 Japan

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Trades Available . . .

Will consider trading Apple Disc software for quantities of ColecoVision & Atari cartridges - (400/800) X1, Xe, 2600, 5200 & 7800. May consider other cartridge software.

Frank M. Polosky
PO Box 9542
Pittsburg, PA 15223

Wanted! Information

on Cracking IBM protection. Also software like Copywrite, Locksmith PC, Central Point Software's PC Option board and PC Watch. Also send list of Apple II items for sale.

Joe Torzewski
51625 Chestnut Road
Granger IN 46530

Sale Sale Sale Sale Sale Sale

Zip Chip GS 8Mhz/32 cache $100
Alpha Syntauri Synthesizer for Apple IIe, all manuals and software, originally $1500. Excellent condition $175
Rastan GS $12
Pipe Dream $12
Task Force $12
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Bouncing Kamungas $8
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DOS Boss $5
Dollars and Sense $15
Halley Project $15

All software is in original packaging and as new. (707) 545-5380

Mike Ferreira
5380 Marigold Lane
Santa Rosa CA 95403

Help! Looking for

a working copy of Eureka & The Graphics and Sounds Development System from the book "Eureka" by Timothy Knight published by Baen Computer Books. Also seeking a copy of Superworks (Appleworks for IBM).

CK Bevan
PO Box 941072
Atlanta GA 30341-0072

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Romualds Boreiko 20
The Unknown Contributor 17
Rich Etarip 10
Ross A. Holmes 16
David R. Hopkins 12
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Krakowicz 16, 20
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74 Algebra Shop ..... Scholastic
63 Alien Mind ..... PBI Software
73 American History Explorer Series ..... Mindscape
75 Anchorman ..... Virginia Reel
74 Animals of the Past ..... Focus Media
72 Ankh ..... Datamost
73 Ant Farm ..... Sunburst
67 Aquatron ..... Sierra
63 Bad Street Brawler ..... Mindscape
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
74 Birds - Trees & Flowers ..... Focus Media
63 Border Zone ..... Infocom
67 Bouncing Kamungas ..... Penguin
66 Boxing ..... ?
65 Bureaucracy ..... Infocom
67 C'est La Vie ..... Adventure International
69 Caverns of Callisto ..... Origin
69 Checker ..... Odesta
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68 D&D-Master Assistant vol2 ..... SSI
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74 Exploring Tables & Graphs Level 2 (SU) ..... Weekly Reader
67 Evolution ..... Sydney
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68 Factastics Trivia ..... Daystar
75 Final Frontier ..... Softsmith
73 Fisher's Cove ..... Tom Snyder Productions
69 Flt Wars ..... Sirius
74 Fraction Action ..... Unicorn
69 Gemstone Healer ..... SSI
73 Geometric Supposer (the) ..... Sunburst
66 GEOS ..... Berkley Softworks
63 Gladiator ..... Taito
73 Goodell Diamond Caper ..... Tom Snyder Productions
66 GradeBuster 1 2 3 ..... Grade Buster
61 Gutenberg Sr. ..... Micromation LTD.
65 Halls of Montezuma ..... Electronic Arts
67 High Orbit ..... Softsmith
67 Horizon V ..... Softsmith
75 Hunt for Red October GS ..... Datasoft
69 Impossible Mission ..... Epyx
62 Indoor Sports ..... Mindscape
68 Infocomics ..... Infocom
66 Jane ..... ?
63 Joker Poker ..... Mindscape
72 Kabul Spy ..... Sirius
68 Kingdom of Facts Santa Barbara/Thunder Mountain
75 Kobayashi Alternative (The) ..... Simon & Schuster
72 Lane Mastodon ..... Infocom
67 Lancaster ..... SVS
72 Laser Force (IIgs) ..... Britannica
81 The Last Ninja (IIe) ..... Activision
75 L.A. Land Monopoly ..... Softsmith
66 Legacy of the Ancients ..... Electronic Arts
65 Lost Tomb ..... Datasoft
81 M-ss-ing L-nks: Classics old & new ..... Sunburst
74 Mammals - Reptiles & Amphibians ..... Focus Media
65 Manhunter New York IIgs ..... Sierra On Line
65 Mavis Beacon Teaches Typing (gs) ..... Software Toolworks
73 McGraw-Hill Problem-Solving Lvl 5&6 ..... Tom Snyder Productions
67 Microwave ..... Cavalier
73 Mind Castle I ..... MCE Inc.
63 Modem MGR ..... MGR Software
68 Mr. Pixel's Cartoon Kit ..... Mindscape
73 Mystery of Hotel Victoria ..... Tom Snyder Productions
63 National Inspirer ... Tom Snyder Productions
75 Neptune ..... Softsmith
66 Observatory (The) ..... Mindscape
74 Ocean Life ..... Focus Media
66 Odin ..... Odessta
63 Operation Wolf ..... Taito
68 Pensate ..... Datasoft/Softdisk
69 Phantasie II ..... SSI
67 Phantoms 5 ..... Sirius
67 Pig Pen ..... Datamost
74 Plants & Animals of the Desert Focus Media
75 Prince of Persia (5.25") ..... Broderbund
67 Project: Space Station ..... Avantage
75 Promethean Prophecy (The) ..... Simon & Schuster
67 Pulsar II ..... Sirius
68 Pure Stat Basketball ..... ?
62 Quadratic Equations II ... Olympus Educational Software
81 Quarter Mile IIe ..... ?
68 Rails West ..... SSI
63 Renegade ..... Taito
67 Rescue Raiders ..... Sir Tech
63 Rocket Ranger (IIgs) ..... Cinemaware
69 Roundabout ..... Datamost
75 Russki Duck ..... Softsmith
63 S.D.I. (IIgs) ..... Cinemaware
62 Sea Stalker ..... Broderbund
67 Serpentine ..... Broderbund
74 Seven Cities of Gold ..... Electronic Arts
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
63 StickyBear Math: Add & Subtract ..... Optimum Resources
68 Stickybear GS Versions 3.5 ..... Xerox
67 Succession ..... Piccadilly
61 Superstar Indoor Sports ..... Mindscape
74 Surveys Unlimited ..... Mindscape
68 Talking Text Writer GS ..... Scholastic
68 Tangled Tales ..... Origin Systems
69 Tetris (IIe) ..... Spectrum Holobyte
72 Theatre Europe ..... PBI
74 The Other Side v2.0 ..... Tom Snyder Productions
81 Think Quick! v1.2 ..... Learning Company
65 Thunder Chopper ..... ?
63 Ticket to Washington D.C. ..... Blue Lion Software
74 Time Explorers ..... Gameco
74 Time Liner v1.1 .... Tom Snyder Productions
68 Tomahawk (IIgs) ..... Datasoft
69 Track Attack ..... Broderbund
68 Triad ..... Thunder Mountain
72 Triango (IIgs) ..... California Dreams
68 Trinity ..... Infocom
73 Unicorn 5.25" software ..... Unicorn
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68 Volcanoes v1.8 . Earthware Comp. Services
66 War in the Middle Earth ..... Melbourne
63 Wings of Fury ..... Broderbund
63 Wizardry:Return of Werda ..... Sir-Tech.
65 Works (the) ..... First Star Software
67 Zenith ..... Softsmith

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84 World's Greatest Baseball Game ..... Epyx/Keypunch

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Special Software Sale

(while they last)

These software packages are **NEW** (shrink-wrapped except for the one copy of Sound Master that I opened in order to find out what it was). They're software packages that someone ordered and then canceled and we were unable to return.

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SubLogic

(All Apple II's) **$5.00**

For use with Jet and/or Flight Simulator v2.0. Each scenery disk covers a geographical region of the country and includes major airports, radio-nav aids, cities, highways, rivers and lakes located in that region. Enough detail is available for either visual or intrumental cross-country navigation.

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Sound Quest In

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For use with the Casio CZ-101, CZ-1000, CZ-3000, CZ-5000 and other compatable synthesizers. Included are file management and bank editing features, patch mixing and random voice generation features. Compose and mix your own music using many of the package options available.

Send orders to Computist at the address listed on the Back issue order form below.

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2	○		24	☐	☐	48	☐	☐	72	☐	☐
Core2	☐		25	☐	☐	49	☐	☐	73	☐	☐
3	○		26	☐	☐	50	☐	☐	74	☐	☐
4	○		27	☐	☐	51	☐	☐	75	☐	☐
Core3	☐		28☆	☐	☐	52	☐	☐	76	☐	☐
5	○		29	☐	☐	53	☐	☐	77	☐	☐
6	○		30	☐	☐	54	☐	☐	78	☐	☐
7	○		31	☐	☐	55	☐	☐	79	☐	☐
8	○		32	☐	☐	56	☐	☐	80	☐	☐
9	○	☐	33	☐	☐	57	☐	☐	81	☐	☐
10	○	☐	34	☐	☐	58	☐	☐	82	☐	☐
11	○	☐	35	☐	☐	59	☐	☐	83	☐	☐
12	○	☐	36	☐	☐	60	☐	☐	84	☐	☐
13	○	☐	37	☐	☐	61	☐	☐	85	☐	☐
14	○	☐	38	☐	☐	62	☐	☐			
15	○	☐	39	☐	☐	63	☐	☐			
16☆	☐	☐	40	☐	☐	64	☐	☐			
17	○	☐	41	☐	☐	65	☐	☐			
18	○	☐	42	☐	☐	66✱	○	☐			
19☆	☐	☐	43	☐	☐	67	☐	☐			
20	☐	☐	44	☐	☐	68	☐	☐			
21	○	☐	45	☐	☐	69	☐	☐			

Some disks apply to more than one issue and are shown as taller boxes.

☆ Limited supply — first-come-first-serve basis.
○ Out-of-print — only "Zeroxed" copies for sale.
✱ Issue 66 is laser printed on 8½ by 11 paper.

Back Issue Order Form

Back Issue and Library Disk Rates

	Quantity	US, Canada & Mexico	All others
Back issues	5 or less	$4.75	$8.75
	6 to 9	$3.75	$6.00
	10 or more	$3.00	$5.00
Zox back issues*	any qty.	$4.75	$8.75
Library disks	5 or less	$5.50	$7.50
	6 to 9	$4.00	$6.00
	10 or more	$3.00	$5.00

Note: Total back issue and library disk orders to get quantity discounts. (ie. ordering 5 back issues and 5 library disks means that you pay the the quantity 10 price of $3 each for both.)

**Due to the time and effort involved in making Zox copies, their price will remain at $4.75 each for US, Canada & Mexico and at $8.75 for all other Foreign.*

Shipping is included in all the prices shown.

What's a library disk?

A library disk is a 5¼ inch floppy diskette that contains programs that would normally have to be typed in by the user. Documentation for each library disk can be found in the corresponding issue.

•Library disks are available for all issues of COMPUTIST.

For a complete back issue list, send a 75¢ stamp to Computist.

_____ Number of back issues. $ _____

_____ Number of Zox back issues. $ _____

_____ Number of library Disks. $ _____

Washington state residents add 7.8% tax $ _____

Total enclosed $ _____

Name _____

Address _____

_____

City _____ State _____ Zip _____

Country _____ Phone _____

VISA

MC _____ - _____ - _____ - _____ Exp. _____

Signature _____ 86

• US funds drawn on US bank. • Most orders shipped within 5 working days, however please allow up to 4 weeks delivery for some orders. • Large orders are shipped UPS so please use a street address. • Offer good while supply lasts. • Call (206) 832-3055 to use a credit card or send check/money order to:

COMPUTIST 33821 E Orville Road Eatonville WA 98328