HOW TO BACKUP, UNLOCK, OR MODIFY COPY-PROTECTED SOFTWARE

Hardcore COMPUTIST

Issue No. 13 $2.50

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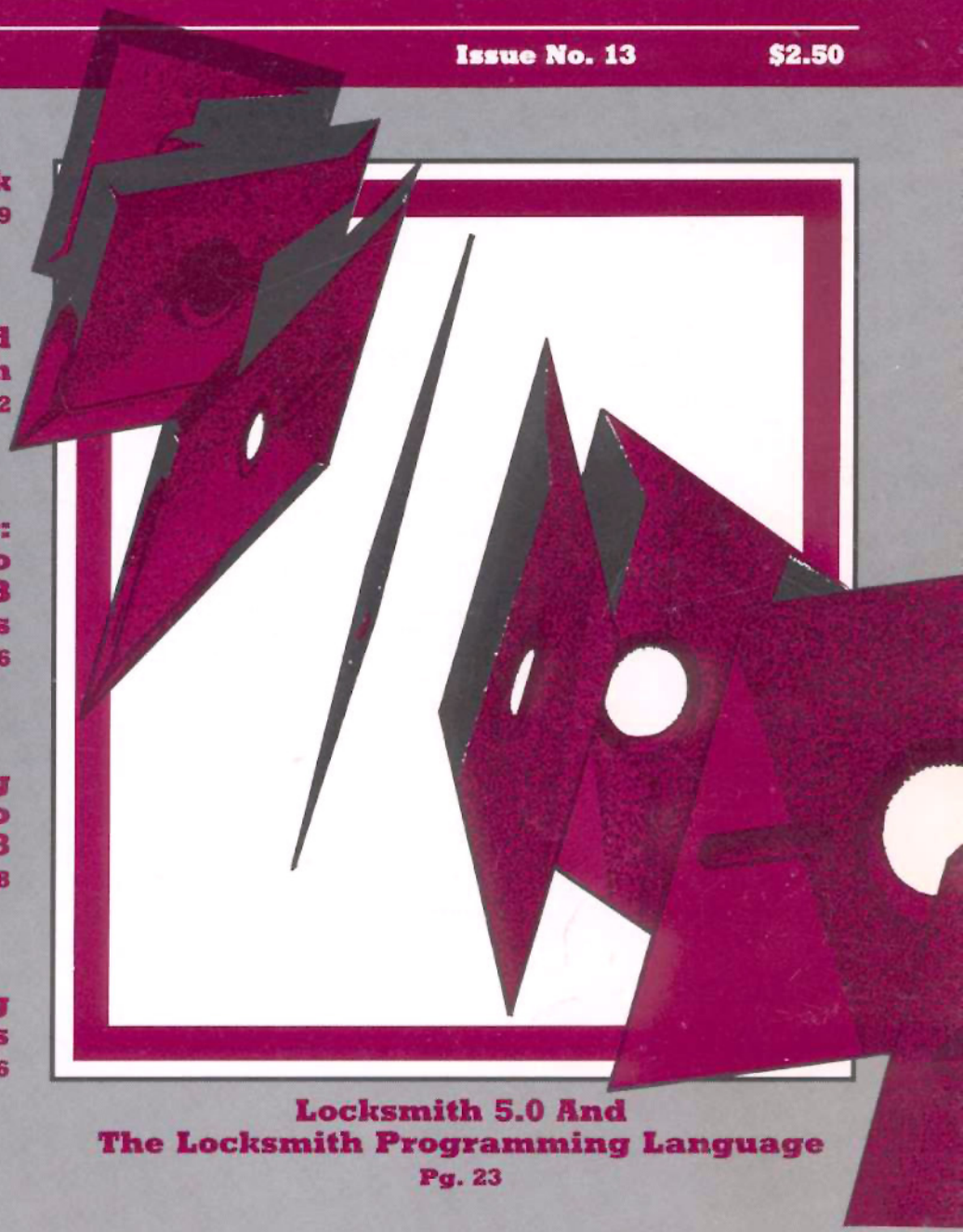

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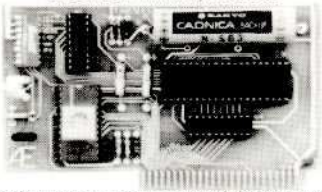

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- Just plug it in and your programs can read the year, month, date, day, and time to 1 millisecond! The only clock with both year and ms.
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- Basic, Machine Code, CP/M and Pascal software on 2 disks!
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The TIMEMASTER II includes 2 disks with some really fantastic time oriented programs (over 40) including appointment book so you'll never forget to do anything again. Enter your appointments up to a year in advance then forget them. Appointment book will remind you in plenty of time. Plus DOS dater so it will automatically add the date when disk files are created or modified. The disk is over a $200.00 value along—we give the software others sell. All software packages for business, data base management and communications are made to read the TIMEMASTER II. If you want the most powerful and the easiest to use clock for your Apple, you want a TIMEMASTER II.

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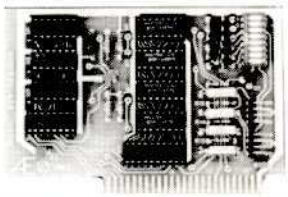
Improved Hardware and Software



- Complete 16 voice music synthesizer on one card. Just plug it into your Apple, connect the audio cable (supplied) to your stereo, boot the disk supplied and you are ready to input and play songs.
- It's easy to program music with our compose software. You will start right away at inputting your favorite songs. The Hi-Res screen shows what you have entered in standard sheet music format.
- Now with new improved software for the easiest and the fastest music input system available anywhere.
- We give you lots of software. In addition to Compose and Play programs, 2 disks are filled with over 30 songs ready to play.
- Easy to program in Basic to generate complex sound effects. Now your games can have explosions, phaser zaps, train whistles, death cries. You name it, this card can do it.
- Four white noise generators which are great for sound effects.
- Plays music in true stereo as well as true discrete quadraphonic.
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- Will play songs written for ALF synthesizer (ALF software will not take advantage of all our card's features. Their software sounds the same in our synthesizer.)
- Our card will play notes from 30HZ to beyond human hearing.
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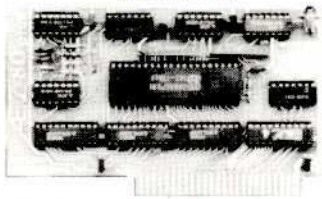

- TOTALLY compatible with ALL CP/M software.
- The only Z-80 card with a special 2K "CP/M detector" chip.
- Fully compatible with microsoft disks (no pre-boot required).
- Specifically designed for high speed operation in the Apple IIe (runs just as fast in the II+ and Franklin).
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SUPRTERM	MORE	NO	YES	NO	NO	NO	NO	YES	YES
WIZARD80	MORE	NO	NO	NO	NO	YES	NO	YES	YES
VISION80	MORE	YES	YES	NO	NO	YES	NO	NO	NO
OMNIVISION	MORE	NO	YES	NO	NO	NO	NO	YES	YES
VIEWMAX80	MORE	YES	YES	NO	NO	YES	NO	NO	YES
SMARTERM	MORE	YES	YES	NO	NO	NO	YES	YES	NO
VIDEOTERM	MORE	NO	NO	YES	NO	YES	YES	NO	YES

The VIEWMASTER 80 works with all 80 column applications including CP/M, Pascal, WordStar, Format II, Easywriter, Apple Writer II, VisiCalc, and all others. The VIEWMASTER 80 is THE MOST compatible 80 column card you can buy at ANY price!

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- Documentation included, we show you how to use all 192K.

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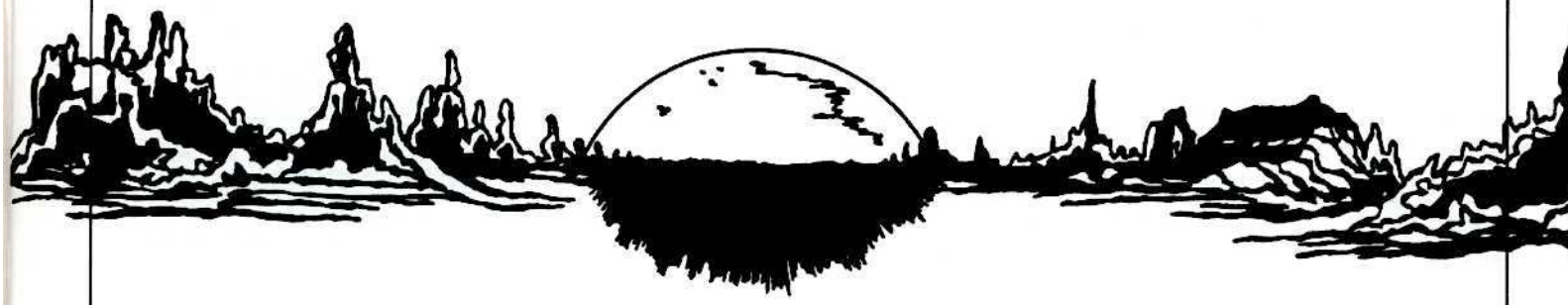

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Many of the articles published in Hardcore COMPUTIST detail the removal of copy protection schemes from commercial disks or contain information on copy protection and backup methods in general. We also print bit copy parameters, tips for adventure games, advanced playing techniques (APT's) for arcade game fanatics and any other information which may be of use to the serious Apple user.

Hardcore COMPUTIST also contains a center CORE section which generally focuses on information not directly related to copy-protection. Topics may include, but are not limited to, tutorials, hardware/software product reviews and application and utility programs.

What Is a Softkey Anyway? A softkey is a term which we coined to describe a procedure that removes, or at least circumvents, any copy protection that may be present on a disk. Once a softkey procedure has been performed, the disk can usually be duplicated by the use of Apple's COPYA program which is on the DOS 3.3 System Master Disk.

Following A Softkey Procedure: The majority of the articles in Hardcore COMPUTIST which contain a softkey will also include a discussion of the type of copy protection present on the disk in question and the technique(s) necessary to remove that protection. Near the end of the article, a step-by-step "cookbook" method of duplicating the disk will appear. Generally, the appropriate actions for the reader to perform will appear in boldface type. Examples are:

1) Boot the disk in slot 6

PR#6

or

2) Enter the monitor

CALL -151

It is assumed that the reader has some familiarity with his or her Apple, i.e. knowing that the RETURN key must be hit following the commands illustrated above.

Hardcore COMPUTIST tries to verify the softkeys which are published, although occasionally this is not possible. Readers should be aware that different, original copies of the same program will not always contain an identical protection method. For this reason, a softkey may not work on the copy of a disk that you own, but it may work on a different copy of the same program. An example of this is Zaxxon, by Datasoft, where there are at least 3 different protection methods used on various releases of the game.

Requirements: Most of the programs and softkeys which appear in Hardcore COMPUTIST require an Apple][+ computer (or compatible) with a minimum 48K of RAM and at least one disk drive with DOS 3.3. Occasionally, some programs and procedures have special requirements such as a sector editing program or a "nonautostart" F8 monitor ROM. The prerequisites for deprotection techniques or programs will always be listed at the beginning article under the "Requirements:" heading.

Software Recommendations: Although not absolutely necessary, the following categories of utilities are recommended for our readers who wish to obtain the most benefit from our articles:

1) **Applesoft Program Editor** such as Global Program Line Editor (GPLE).
2) **Disk Editor** such as DiskEdit, ZAP from Bag of Tricks or Tricky Dick from The CIA.
3) **Disk Search Utility** such as The Inspector, or The Tracer from The CIA.
4) **Assembler** such as the S-C Macro Assembler or Big Mac.
5) **Bit Copy Program** such as COPY II+, Locksmith or The Essential Data Duplicator.
6) **Text Editor** capable of producing normal sequential text files such as Applewriter II, Magic Window II or Screenwriter II.

Three programs on the DOS 3.3 System Master Disk, COPYA, FID and MUFFIN, also come in very handy from time to time.

Hardware Recommendations: Certain softkey procedures require that the computer have some means of entering the Apple's system monitor during the execution of a copy-protected program. For Apple II+ owners there are three basic ways this can be achieved:
1) Place an INTEGER BASIC ROM card in one of the Apple's slots.
2) Install an old monitor or modified F8 ROM on the Apple's motherboard. The installation of a modified F8 ROM is discussed in Ernie Young's, "Modified ROMS", which appeared in Hardcore COMPUTIST No.6.
3) Have available a non-maskable interrupt (NMI) card such as Replay or Wildcard.

Longtime readers of Hardcore COMPUTIST will vouch for the fact that the ability to RESET into the monitor at will, greatly enhances the capacity of the Apple owner to remove copy protection from protected disks.

A 16K or larger RAM card is also recommended for Apple][or][+ owners. A second disk drive is handy, but is not usually required for most programs and softkeys.

Recommended Literature: The Apple II and II+'s come bundled with an Apple Reference Manual, however this book is not included with the purchase of an Apple //e. This book is necessary reference material for the serious computist. A DOS 3.3 manual is also recommended.

Other helpful books include:

Beneath Apple DOS, Don Worth and Peter Leichner, Quality Software. $19.95.

Assembly Lines: The Book, Roger Wagner, Softalk Books. $19.95.

What's Where In The Apple, William Lubert, Micro Ink. $24.95.

Typing In BASIC Programs: When typing in basic programs, you will often encounter a delta ("▲") character. These are the spaces you MUST type in if you wish your checksums to match ours. All other spaces are merely printed for easier reading and don't have to be keyed in. Any spaces after the word DATA that aren't delta characters MUST be ommitted!

It is a good idea to SAVE your BASIC program to disk frequently while typing it in to minimize the loss of data in the event of a power failure.

Checksoft: Checksoft is a Binary program that checks Applesoft programs to ensure that you have keyed them in properly. Every bin program we print has companion checksums which consist of the Applesoft program's line numbers and a hexadecimal (base 16) number for each line. After keying in a BASIC program, BRUN checksoft and compare the checksums for every line that Checksoft generates with those at the end of the program. If you use Checksoft and make a typing error, your checksums will differ from ours beginning at the line where you made the error.

Typing In Binary Programs: Binary programs are printed in two different formats, as source code and as object code in a hexadecimal dump. If you want to type in the source code, you will need an assembler. The S-C Macro Assembler is used to generate all the source code which we print. In our source code listings, the memory address of the each instruction is printed at the beginning of every line (instead of the line number).

Binary programs can also be entered directly with the use of the Apple monitor by typing in the bytes listed in the hexdump at the appropriate addresses. Be sure to enter the monitor with a **CALL -151** before entering the hexdump. Don't type the checksums printed at the end of each line of the hexdump and don't forget to BSAVE binary programs with the proper address and length parameters listed in the article.

Checkbin: Like Checksoft, Checkbin also generates checksums, but was designed to check binary (machine language) programs.

Whenever Hardcore COMPUTIST prints a hexdump to type in, the associated Checkbin generated checksums are printed after every 8 bytes and at the end of every line.

Checksoft and Checkbin were printed in Hardcore COMPUTIST No. 1 and the Best Of Hardcore Computing and are sold on Program Library Disk No. 1 and the Best Of Hardcore Library Disk.

Let Us Hear Your Likes And Gripes: New and longtime readers of Hardcore COMPUTIST are encouraged to let us know what they like and don't like about our magazine by writing letters to our INPUT column. Our staff will also try to answer questions submitted to the INPUT column, although we cannot guarantee a response due to the small size of our staff. Also, send your votes for the softkeys you would like to see printed to our "Most Wanted List."

How-To's Of Hardcore

Welcome to Hardcore COMPUTIST, a publication devoted to the serious user of Apple][and Apple][compatible computers. We believe our magazine contains information you are not likely to find in any of the other major journals dedicated to the Apple market.

Our editorial policy is that we do NOT condone software piracy, but we do believe that honest users are entitled to back up 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 application programs to meet his or her needs.

New readers are advised to read over the rest of this page carefully in order to avoid frustration when following the softkeys or typing in the programs printed in this issue. Longtime readers should know what to do next: Make a pot of coffee, get out some blank disks and settle in for a long evening at the keyboard.

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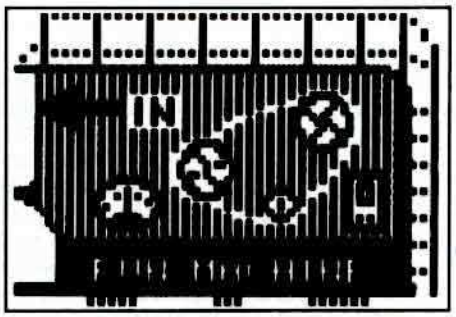

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Issue No. 13

Hardcore COMPUTIST

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9 **Normalizing LafPak**
Tired of waiting a million years just to play Mine Sweep? This article makes waiting a thing of the past by presenting an in-depth look at how to first remove the copy protection from the Laf Pak game package and then, crunch the games even more by making them into BRUNable files. With the addition of a fast DOS, Mine Sweep can be played in the blink of an eye! *By Ferrell Wheeler.*

12 **BENEATH Beyond Castle Wolfenstein**
Hardcore COMPUTIST continues the Wolfenstein saga. Uncover the secrets to the deprotection of this excellent game program then, discover everything you've wanted to know about APT's and game modifications. *By Ray Darrah.*

14 **Softkey For Transylvania & The Quest**
Use Super IOB to completely remove all copy protection from these and, possibly, many other Penguin game programs. *By Thomas A. Phelps.*

DISK- **16** **CSaver: The Advanced Way To Store Super IOB Controllers**
Inspired by a letter in Hardcore COMPUTIST No. 10, this program provides the user who owns a language card (16K RAM card, etc.) with the power to merge programs (designed to store Super IOB Controllers quickly and easily). *By Ray Darrah.*

CORE SECTION

18 **Adding New Commands To DOS 3.3**
Acquire two new and useful commands for DOS 3.3 which will help you to easily manipulate *any* file. Even Text Files can be handled up to 500% faster. *By Gary Peterson.*

20 **Fixing A ProDOS 1.0.1 BSAVE Bug**
Ever notice that sometimes ProDOS doesn't BSAVE exactly what you want? Cure the problem with this interesting information. *By Cecil Fretwell.*

21 **Enhancing Your Apple: REVIEW**
Does this book on Apple modification measure up? Find out with this review of Don Lancaster's publication which illustrates a number of hardware modifications for the Apple computer (and a few other sneaky hints). *By Martin Collamore.*

23 **Locksmith 5.0 And The Locksmith Programming Language**
An inside look at the "new" Locksmith. Also included: An explanation of how parameter changes are replaced by the use of the Locksmith Programming Language. *By Thomas H. Dragon.*

26 **Deprotecting Electronic Arts**
Make three Electronic Arts releases (Cut & Paste, The Last Gladiator, and One On One) COPYAble. In addition, review the ground work for the possible deprotection of several other EA programs. *By Pete Levinthal.*

DEPARTMENTS

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Softkey For DLM Software
By Chris Chenault & Ray Darrah

Softkey For Learning With Leeper
By Marco Hunter

Softkey For TellStar
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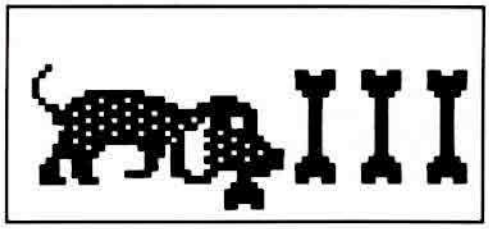
25 **WHIZ KID**
By Ray Darrah



INPUT INPUT INPUT

Alpha And Omega

I would like to ask if you have any knowledge of Omega's bankruptcy and whether or not Alpha Logic Business Systems is planning on honoring subscriptions and disk orders that I sent to Omega.

In December, I ordered Locksmith 5.Ø and Night Falls; in June I received Locksmith 5.Ø (and I would have to say that I have yet to be able to copy anything at all with it: it is hopeless), but have not as yet received Night Falls. As I had prepaid, I am a little upset by this. I also ordered (and prepaid) for a disk with their parameter list as well as a subscription to the Newsletter. To date, some four months later, I have heard nothing.

Fortunately, I also have EDD III. This is currently my favourite copy program next to COPYB and Super DeMuffin Plus.

Also, a quick softkey routine which I have just used on Transylvania, Minit Man and Arcade Boot Camp (which are all great games):

1) Boot Disk
2) Reset into monitor via Integer Card

B925:18 6Ø
B988:18 6Ø
B942:18 6Ø

3) BLOAD FID or COPYA

CALL -151
B954:4A 49 6A DØ EF
B934:C9 DA
B99Ø:C9 DA
8Ø3G

(starts FID or COPYA)

4) Copy files to blank disk (COPYA will also format the disk. FID will not.)
5) Overwrite DOS with Fast DOS or Diversi-DOS
Minit Man needs changes to HELLO program and others as outlined in an earlier magazine. Arcade Boot Camp runs without changes, but Transylvania may need minor changes.

Another quick one:
For Kabul Spy:
Use Locksmith 4.1 to copy TØ-21. Then use a sector editor to load TØ Sector Ø and change bytes 49,4A and 4B to EA's. This defeats the check routine on T22.

I would also like to know if anybody has copied Fortress of the Witch King from Avalon Hill. I have been able to get a Catalog (it uses a non-standard DOS) but cannot transfer any files.

Keep up the good work!

Dr. Leigh Rowan-Kelly
North Hobart, Tasmania
Australia

Dr. Rowan-Kelly: We have spoken to the folks at Alpha Logic concerning what you, and other people who placed orders with Omega but never received delivery, should do. They suggest you send whatever information you have concerning the order (name and address, Locksmith serial #, order date, products ordered, date the check cleared, etc.) to them at:

Alpha Logic Business Systems
4119 North Union Road
Woodstock, IL 6ØØ98

When Alpha Logic took over from Omega, the correspondence was apparently in considerable disarray, so Alpha Logic may or may not have a record of your order. Alpha Logic did not directly receive any funds as a result of Omega's bankruptcy, but in order to maintain good relations with its customers, they are trying to honor all orders which were placed with Omega for Locksmith and its related products (Inspector, Watson and the Locksmith Newsletter). The rights for some of Omega's products, such as the game Night Falls, were not acquired by Alpha Logic and it is not clear how they will handle an order such as the one you placed. In any case, supply Alpha Logic with whatever information you can.

Many thanks for your softkeys and parameters.

Stung By Stoneware

Re Paul Raymer's letter in Hardcore COMPUTIST No. 8. — page 3

I would like to add to his comments by saying that support from Stoneware in this part of the world is NIL.

I have been involved in three upgrade orders from Stoneware and, in all cases, the order was lost. This has resulted in extra expense by way of telexes (which Stoneware refuses to answer) and telephone calls in which promises were made and not kept.

The upgrades have arrived eventually (at least four months after being ordered) and, in the latest case, an incorrect Customs declaration by Stoneware caused Customs to assess sales tax on the value plus 2Ø%.

Another user I know has been having problems with the DIF file translator. She is responsible for keeping certain hospital records on DB MASTER. Not only has Stoneware refused to give her any help, but they have even held onto at least six disks which she has sent them. She has spent nearly $1ØØ on phone calls and telexes, to no avail.

This brings me to the point where I say that the software is good, but the service is lousy. Therefore, it is essential to have backups of the program disks.

The parameters for DB Master Version 4 in Hardcore COMPUTIST No. 1Ø did not work on my copy. However, by using Locksmith 5.Ø to copy tracks $Ø to $6, $6.5 to $11.5, $14.5 to $22.5, and EDD (in mode 2) to copy tracks $12.25 and $13.25, I have succeeded in making working backups. EDD has to be used repeatedly on the two quarter tracks until no error message appears (usually about three goes per track). The quarter tracks appear to be crucial only on program disk No. 1.

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DB Master Version 4 Plus, however, appears to use a different protection scheme and has so far resisted all attempts to make backups (as we are permitted under new Australian copyright laws). Therefore, I request that you put DB Master 4 Plus on your Most Wanted List.

Anthony L. Barnett
Prospect, Australia

Replay, SSI, DeMuffin, Etc

I think that your magazine is great! The information you have published in previous issues has proved very helpful to me, but a couple of problems have been irritating the heck out of me.

First, would you please add Prime Plotter (Primesoft Corporation) and Bookends (Sensible Software) to your Most Wanted List? Prime Plotter appears to have a very sophisticated and multi-layered protection scheme. Bookends is not as bad, but I haven't been able to copy it, either.

Second, my SSI disks won't boot; they just beep at me. SSI customer support claims that either my drive speed is off (it isn't) or I need an alignment job (I may). I solved this problem by copying the boot sequence with my Replay Card. Now I have a binary program called SSI BOOT on the back side of my SSI disks.

Do you know what happened to the automatic packing program promised to Replay owners by Micro-Analyst, Inc.? I haven't been able to get a response from their answering machine at (512) 926-4527.

Third, some softkeys tell you to reset into the monitor during or after the boot; however, many protected programs reboot if you hit reset. So, how is one to get into the monitor in such a case?

Fourth, a program called Super DeMuffin is floating around. Could you publish an article which lists the program and explains how to use it?

Finally, a couple of suggestions. How about a list of BB phone numbers for those of us with modems? And, could you publish a list of addresses and phone numbers of other useful sources of information? I am, for example, familiar with Pirate's Harbor, P.O. Box 8928, Boston, MA Ø2114; tele-

phone (617) 720-3600 for modem, password required.

Dr. James N. Snaden
Newington, CT

Dr. Snaden: *Thanks for your suggestions. We will see what we can do.*

Owners of the Replay card should have received notice that the packing program you mentioned is now available. Perhaps you are no longer on their mailing list. To get the program, call or write Micro-Analyst.

If you have an autostart F8 ROM, your Replay card can be used to get you into the monitor when following most of the softkeys we publish.

Lowercase Deadline

On my copy of Deadline (an old one), the locations for the Upper and Lower case output are different. The bytes at Track 2, Sector 9 are at $E9-F3 on Sector 11. The byte at Track 2, Sector 7 is at $3C, and I have not been able to find the location of the other byte. Can anybody help me?

Erik Talvola
Agoura Hills CA

Erik: *Sorry, we can't be of any help to you here. We will have to turn this one over to our readers.*

Locksmith 5.0 Patch

Re Roger M. Levin, INPUT, Issue No. 10.

The suggested single byte change on Track $F, Sector $E to render Locksmith 5.0 copyable works fine. The disk is thereafter completely copyable via COPYA. However, with a copy of my particular disk, neither the Disk Certification nor the Drive Speed functions are accompanied by a useful monitor display. Both of these work perfectly when I use my original. Can you elaborate on how to copy the disk so as to retain all of its functions within the copy? I sure would appreciate it.

Along other lines: I have nothing but the highest praise for the content of your publication. I wondered (along with everyone else, I suspect) why you underwent such confusing name and format changes early in your history and was apprehensive about losing such a valuable source of otherwise unavailable information. However, I am delighted that your magazine persists in ANY form. In my opinion, your publication is the best available for anyone seriously interested in Apple software - period. Please accept my wishes for your continued success and my personal thanks for the invaluable information I have gained through your efforts. No one else could do it any better.

Brian T. Halonen
Sturtevant WI

Brian: *Here is a different sector edit, submitted by Mr. Dan Lui, that can be performed on a COPYA of Locksmith 5.0.*

Track	Sector	Byte	From	To
$10	$05	$18	$38	$F2
$10	$05	$18	$7D	$F3
$10	$05	$18	$0A	$F0

So far as we have been able to tell, a completely functional copy of Locksmith 5.0 will result.

Atarisoft Revisited

Requirements:
48K Apple][,][Plus, //e
One disk drive
DOS 3.3

Dig Dug and Defender, like all Atarisoft games, can be copied as Robotron was in Hardcore COMPUTIST No. 8. But in copying a disk, if possible, I like to put the game into one file so it can be saved under the game's name on a program backup disk with many other games (instead of one game per disk).

In Dig Dug, three files are needed for the game to run. Here is how you'd make a single file of Dig Dug off the original disk:

1) Boot normal DOS 3.3.
2) Put the original in the disk drive.
3) Enter the monitor by typing

CALL -151

4) Change the error detection routine in DOS by typing

B942:18

5) BLOAD the three programs in the right place:

BLOAD RELOCATE,A$0042
BLOAD TP,A$8192
BLOAD OBJECT CODE

6) Put in the disk you wish to save the file on and type

BSAVE DIG DUG, A$0042, L24726

7) Smile, you're done!

For Defender you can use steps 1-4 then

BLOAD BILL BOGENREIF 10/9

5) Put disk to save in drive and type

BSAVE DEFENDER,A16384,L16384

Trevor Churchill
Kindersley, Saskatchewan
Canada

Assorted Tips

For whatever it is worth, the following techniques work:

1) The softkey for Visiterm would not work on my version. However, it uses a bit insertion technique, so Copy II+ 4.4 from the main menu works nicely.

2) Some of the Stickybear series may be COPYAed. Then edit Track 2, Sector 6, byte 00 : 60 and Track 2, Sector 7 Byte 00 : 1F.

3) Snooper Troops 1 & 2 from Spinnaker succumb nicely to IOB. Track 9 burps a lot, but if you IOB the disk, then FID it over to normal DOS 3.3, everything works. Unfortunately, I think that it is the only Spinnaker disk with a normal VTOC.

4) The Krell SAT series works with DeMuffin, and also works loading and saving to tape. Using a casette recorder is often overlooked, but it works for a lot of programs.

5) The Cracking Techniques '83 and '84 disks from Pirate's Harbor have a lot of good stuff on them, including some of the programs from the Most Wanted List.

6) Many older programs and educational programs from small companies can be COPYAed. It's so simple that it is worth a try before you spend a lot of time on it. Just perform the following sequence

RUN COPYA
CTRL-C
70
CALL -151
B92F:18 60
B98B:18 60 kills data marks
RUN

If that doesn't work, repeat with

B925:18 60
B988:18 60 kills checksum

I do consulting work for several schools and part of what I do is make backups of new software before the kids get their little hands on it. Naturally, if I were voting, I would like to see more business and educational softkeys and less emphasis on games.

One final question: Do you have any knowledge of a nibble copier called Echo from Nagrant Systems? Almost everyone I know has a copy, yet nobody has ever seen an ad for it, heard of the company, or seen a manual to it. What gives?

Carl A. Meyer
Kettering OH

Mr. Meyer: *We have been unable to find a reference to the Echo nibble copier you mention. Perhaps our readers can come up with some information for you.*

Sensible Speller IV Entry Points

I would like to report that I have had success backing up Sensible Speller IV 4.0i and 4.0k using Lamont Cranston's method from Issue No. 10. However, for an entry point for the program(s), I used the second and third bytes found on track $08, sector $00. This gave me entry points of $350F for 4.0k and $3517 for 4.0i, which do not agree with those given in Issue No. 11. Interestingly enough, both the entry points you listed and the ones I used seem to work equally well. Maybe you can explain why. I can't. I still

suspect that all the versions may have their entry point located there (track $8, sector $Ø), even though other entry points will work.

Concerning the review of the Copy II Plus 4.4C copy program - the update manual also fails to mention that they give you the 4.4 program on the front side as well as the older 4.3 program on the back side. So far, I have found at least one disk that would not copy by the defaults on the 4.4. The parms listed for the 4.3 would not work either. The older 4.3 with the given parms would copy it, so having both is a definite advantage.

The parms given for Sensible Speller in Issue No. 11 (with the article about Copy II Plus) is probably for version 4.Øk. It is a special version they will send to you if you have trouble with it booting. I have a Fourth Dimension drive that works fine for most disks, but it would not boot the 4.Øi. The 4.Øk would not only boot, but would copy in several ways (unlike the 4.Øi and probably most of the others).

For those who have similar drives, I have noticed one other problem in that you can make a copy (in this case, RENDEZVOUS) which will not boot on the Fourth Dimension, even though the original will. However, the copy will boot on the Apple Disk II drive. There may be others, like me, who thought they were having no success when all they really needed to do was change the drives around. This could be a problem for some people in that the instructions with most copy programs to change the master vs. slave drives by software will not solve. Instead, a physical change of the plugs is necessary.

Gerald Gibson
Dallas TX

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page 6

I have just received Issue No. 1Ø with the article by "The Shadow" (Lamont Cranston) concerning Sensible Speller IV.

There was a typo in his article referring to entry storage at $3E-3F. This should have read $4E and $4F.

Version 4.Øh can be done as per article. Actual entry is $34F9. Change line 1Ø7Ø of assembly listing to $34F9. Change hexdump to: B79Ø: 4C F9 34.

G.L. Scott
Charlotte NC

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page 6

I have version 4.Øj of Sensible Speller IV. Following the program outlined in Hardcore COMPUTIST Issue No. 1Ø, I was able to deprotect it. This required a change in the entry point. In the Boot 2 Object Code program, change B791 from 17 to 22. This gave me a COPYAable Sensible Speller IV.

Gordon F. Myers
Dayton OH

Apple][Owners Respond

In response to your note on Page 5 of Hardcore COMPUTIST No. 11, please let's not clutter Hardcore with IBM info or even Mac-stuff. The owners of those machines will certainly benefit from a "Hardcore-type" magazine, but let them find it between their own covers. I believe they also would appreciate the narrowness of focus that Apple][users realize with Hardcore COMPUTIST in its present form.

Another topic: Can you please furnish me with the address of Synergetics (mentioned in the INPUT column for HC No. 11)? I'm interested in the //e RESET mod.

Thanks for the great magazine!

Marvin L. Wager
San Diego CA

Mr. Wager: The address of Synergetics is:
Synergetics
Box 1300
Thatcher, AZ 85552
(602) 428-4073

We forgot to mention that this RESET mod kit for the //e does require access to an EPROM burner.

The situation has presented itself, so I must act. I would not like to see Hardcore COMPUTIST begin aiming towards other computers, but to continue serving the Apple][series users.

Let me digress for a moment. Once I had subscriptions to Softalk, St. Game (originally Softline), Creative Computing, Call A.P.P.L.E., Nibble and Hardcore COMPUTING. I also had access to many other multi-brand magazines that at least had a section for Apple]['s. As each magazine became relatively useless (considering the price to information ratio), I stopped reading them and as subscriptions waned, I let them drop. The last to go was Call A.P.P.L.E. It had lots of article/programs and great deals for Mac owners, double hi-res vision users and anyone who might want to drag a //c to school.

My Apple][+ talks, has a light pen, keeps my books, plays music and games, draws 3-D pictures, processes words, cracks codes and cyphers and many other things too numerous to mention. One difficulty I have is getting the thrill of high scores on games like younger people can usually do. Running out of ships, men or time can be a real bummer. I have kept my subscription to Hardcore since the info between its covers is worth the price. I can modify games to make up for my slower reflexes and I can modify utilities to better fit my applications.

Hardcore COMPUTIST serves these purposes. Each issue is thin enough, without having its space filled with information that is irrelevant to me.

As more Apple][series owners become aware of your magazine, your circulation should increase accordingly. As your income permits, you can develop sister publications for the users of other computers, letting them evolve the way Hardcore has.

Thank you for your consideration of my opinion.

Milo Von Tressel
Savanna IL

I really enjoy your magazine, all the more so since many of the other Apple magazines have gone "soft core". If you decide to cover IBM (hate 'em) or MacIntosh, please implement it as separate issues, as those machines have no relevance to me.

William E. Krantz, Jr.
North Wales PA

I was very upset when I saw that you are considering expanding Hardcore COMPUTIST for other computers. Please don't!! Once you start to expand to other micro's, there is no stopping. We will end up with a magazine that has just a few pages on each micro. If you do expand to other computers, please do so by creating a new magazine for each computer.

Taco Van Ieperen
Calgary, Alberta
Canada

Other Owners Respond, Too

Re Hardcore COMPUTIST No. 11.

Page 5: Yes! Macintosh! IBM PC!

Page Ø: Applied Engineering ad: The reference to Z-8Ø Plus is somewhat dishonest. The "4MHZ" is really 3.58, but more importantly, "High Speed" is misleading. It is no faster than standard softcard or its clones in the Apple][Plus.

Keith Davison
Brookline MA

In your Hardcore COMPUTIST No. 11, Page 5, you request an opinion on whether we would like to see information related to copy protection on other (than Apple) popular micros.

The answer is a resounding yes for the IBM-PC. You will note in Softalk that COPY II Plus is a best-seller.

If you decide to go ahead on this project, please notify me so I can subscribe.

A.M. Platt
Richland WA

Super IOB Problem

I am having two problems with the Super IOB program which appeared in Hardcore COMPUTIST No. 9: → page 11

1) Line 1Ø1ØØ of the program is giving me a fit because I can't tell how many blank

Continued on page 27

READERS' SOFTKEY & COPY EXCHANGE

Deprotecting Snooper Troops (Case #2)

By Jim Mitchell

Spinnaker Software
215 First St.
Cambridge MA 02142
$44.95

Requirements:
Snooper Troops Case #2
One blank diskette
System Master diskette
Super IOB

Snooper Troops II is an educational game by Spinnaker Software for ages 10 to adult. This game and Snooper Troops I are copy protected in exactly the same way and cannot be backed-up using the usual copy programs. However, they can be transformed into COPYA form without too much difficulty.

The copy protection consists of changing the address field header from D5 AA 96 to BB AA 96, and leaving track $09 empty (actually filled with $FF's). When Snooper Troops is copied with Locksmith or Copy][plus, the disk will boot and send you off to track $09 where you will stay until you boot another disk. To change this program into the friendlier COPYA form, all you need to do is use a Super IOB controller to read the address field header as BB AA 96, and write the track back onto an empty disk with the normal D5 AA 96 address field header. When all the tracks have been transferred to the new disk, DOS 3.3 will be written onto the disk using the Master Create program from the System Master diskette. You should then have an unprotected copy of Snooper Troops, Case #2, which you may examine or modify at your leisure.

Procedure:
1) Type in and save the Super IOB controller at the end of this article.
2) Next, save the program in case of an error. I also suggest that you write- protect your original copy of Snooper Troops to protect it during this procedure, but be sure to remove it before running the program because it will not run properly, otherwise.
3) Run Super IOB and follow the prompts that the program will display on your monitor. Note that your drive will make noise when reading tracks $00 and $09. Do not interrupt the procedure. Just ignore the noise if possible; it will not affect the finished product. Also, note that tracks $00 through $02 will not be copied.
4) When the copy is completed, remove the original copy of Snooper Troops and place it in a safe location.
5) Insert your System Master diskette and execute the master create program.

BRUN MASTER CREATE

6) When asked for the name of the greeting program, type HELLO.

7) Now insert your new copy of Snooper Troops that you just made with Super IOB and press RETURN. DOS 3.3 will now be written onto the disk and, when the disk is booted, the HELLO program will automatically run.

You may now CATALOG the disk, examine the program, and modify it if you like. You may also copy the new disk using COPYA or any other copy program.

This program will also allow you to make a backup copy of Snooper Troops, Case #1. I have not attempted to use it on any other programs from Spinnaker Software, but I suspect that it might work on some of them. It will also work on Piece of Cake, an educational math program by Counter Point Software, which I found to have a nearly identical protection scheme. No changes to the program are necessary.

Snooper Troops Controller

```
1000 REM SNOOPER TROOPS
1010 TK = 3 : ST = 0 : LT = 35 : CD = WR
1020 T1 = TK : GOSUB 490 : RESTORE :
     GOSUB 190
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 = 9 THEN
     TK = 10
1055 IF TK < LT THEN 1030
1060 GOSUB 230 : GOSUB 490 : TK = T1
     : ST = 0
1070 GOSUB 430 : GOSUB 100 : ST = ST + 1
     : IF ST < DOS THEN 1070
1080 ST = 0 : TK = TK + 1 : IF TK = 9 THEN
     TK = 10
1085 IF BF = 0 AND TK < LT THEN 1070
1090 IF TK < LT THEN 1020
1100 HOME : PRINT : PRINT "DONE^
     WITH^COPY" : END
63010 DATA 187 ,170 ,150
```

Controller Checksums

```
1000  - $356B      1060  - $E86A
1010  - $3565      1070  - $E06F
1020  - $5319      1080  - $3E31
1030  - $4518      1085  - $B65A
1040  - $4BDF      1090  - $31B8
1050  - $ACB5      1100  - $346A
1055  - $0D2D      63010 - $416D
```

Softkey For DLM Software

By Chris Chenault & Ray Darrah

Development Learning Materials
1 DLM Park
Allen, TX 75002

$39.00

Requirements:
48K Apple or Apple //e
Super IOB from Issue No. 9
A blank disk
Alligator Mix, Demolition Division, Alien Addition or Minus Mission

Demolition Division is a drill that makes division fun for youngsters. In this game, you use your correct answers to shoot enemy tanks. You have a choice of speed, difficulty and paddle or keyboard control.

Alligator Mix is a math drill that consists of a mixture of addition and subtraction problems. In this game, you can only feed the alligator if the answer to the addition or subtraction problem matches the answer he has on his tummy.

Alien Addition is an addition drill made into an arcade game. The game gives you the ability to change speed and difficulty levels and is one of many great education games that offer children fun while they learn.

In Minus Mission, falling blobs of subtraction problems threaten to overcome a robot with green slime. Arcade skill is required as well as subtraction skill to save the robot.

For all of these great programs, I have developed a Super IOB controller that deprotects them nicely. I think it may work on other DLM releases as well as the four mentioned above.

In any case, here are the steps to follow when deprotecting one of these educational masterpieces:
1) Type in the Super IOB controller at the end of this article and save it.
2) Next, boot a normal DOS diskette and initialize a blank disk with the filename the same as the disk you wish to copy (Ex. if you want to copy Minus Mission, type INIT MINUS MISSION).

INIT program name

3) Execute the Super IOB program with the DLM controller installed.
4) When Super IOB is finished, try to boot the copy. If everything comes up OK then you're finished. If you get a "FILE NOT FOUND", CATALOG the disk and RUN the first file you see. This should have been the program name you used in step 2. You may go back to step 2 and try again if you like.

DLM Controller

```
1000 REM DLM SOFTWARE CONTROLLER
1010 TK = 3 : ST = 0 : LT = 35 : CD = WR : MB
     = 130 : DOS = 13
1015 GOSUB 360 : GOSUB 270 : GOSUB 360
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 "EVERYTHING^O.K.^
     NO^DOS^ON^COPY" : END
10010 PRINT CHR$ (4)
     "BLOAD^RWTS.13,A$1900"
```

Controller Checksums

1000	- $356B	1060	- $119C
1010	- $EA98	1070	- $1999
1015	- $69EC	1080	- $302B
1020	- $38DE	1090	- $88AE
1030	- $2EDF	1100	- $30CD
1040	- $521E	10010	- $3361
1050	- $767D		

Softkey For Learning With Leeper

By Marco Hunter

Learning with Leeper
Sierra On-Line Inc.
Sierra On-Line Building
Coarsegold, CA 93614
(209) 683-6858
$34.95

Requirements:
48K Apple or compatible
One disk drive and DOS 3.3
COPYA
A sector editor
A blank disk
Learning with Leeper

The three things you can count on in this life are death, taxes, and Sierra On-Line's nibble counts. With this in mind, I tackled Learning with Leeper, a recent educational release from Sierra. I quickly discovered that, as usual, the disk is normal DOS 3.3. This means it is easily copied with COPYA (although it will not work correctly). Then, after some trial and error copying, I discovered that the nibble count checks track 0. This was also standard Sierra.

Tracks $00, $03, and $1F are popular tracks for Sierra On-Line nibble counts. Finally, I decided to go all out and remove the nibble count entirely. Well, as it turned out, it wasn't that tough. When I finally found the nibble count routine, I decided that the easiest thing to do was simply avoid jumping into it, rather than trying to modify it.

Here are the steps to deprotect Learning With Leeper:

1) Boot system master.
2) Make a regular backup of Learning with Leeper.

RUN COPYA

3) Use your sector editor to modify these bytes on the new copy eliminating the nibble count routine.

Track	Sector	Byte	From	To
$03	$0F	$2C	$20	$EA
$03	$0F	$2D	$00	$EA
$03	$0F	$2E	$12	$EA

That's all there is to deprotecting Learning With Leeper. Have fun with the backup.

Softkey For TellStar

By William Wingfield, Jr.

TellStar
Information Unlimited Software
281 Arlington Avenue
Berkeley, CA 94707
$39.95 Level 1
$79.95 Level 2

Requirements:
Apple][Plus or //e
Inspector/Watson
Initialized 3.3 disk

TellStar is an absolutely amazing program. It is great to have around for the people that look at the Apple and say, "So what does it do other than play games?" I have yet to see anyone who hasn't been impressed by TellStar's information of the night sky. The program does have one slight problem, though. Copy protection. That problem can be remedied quite easily so that the program can be viewed and reduced in size from a whole disk to 326 sectors.

There are two parts to the protection scheme for this program. The first is an altered 3.2 format. The second is a phony catalog on track $11; the real catalog is on $15. It's good to know that someone puts those Beagle Brothers tip books to use. We'll use Muffin as our 3.2 code source and to transfer the files when we are ready.

The first thing to do is to fix the catalog so that Muffin can find the files. We'll be writing to the TellStar disk, so use a backup to be on the safe side.
1) Boot the Master disk and install Inspector (or Watson) and load Muffin.

BLOAD MUFFIN

2) Now we'll fix the 3.2 code to match that used by TS. You can make the changes from Inspector or from the monitor. The last byte of the Address marker changes from track to track so we'll make DOS ignore it.

1A8A:29 00

3) The last byte of the End-of-Data marker has been changed to D5 so we'll match that next.

1A60:D5

4) Since we need to write to the disk, we must also match the bytes in the section of DOS that does the writing. The last byte of the address marker on track $11 is $D6 (you may wish to verify the markers on your disk in the event that they aren't all the same) so we'll match it.

1FFF:D6
19E3:D5

5) Now to fix the CATALOG. Enter Inspector if you haven't already done so. Inspector uses $3DA-3DB as a pointer for the RWTS it uses when accessing a disk. The RWTS for Muffin that we just altered is at $1E00 so edit these bytes to $00 and $1E respectively. Next, go to a clean buffer such as $50 and read in T$11, S$C. Bytes $2 and $3 show $11 and $0C, the fake CATALOG. Edit these to $15 and $09, the real catalog location, and write the sector back to the disk. Return the pointer on page 3 to $B7B5 and exit Inspector.
6) Now to unlock the disk. Start up Muffin.

CALL 2051

7) Use " = " for FILE NAME and transfer all the files to the 3.3 disk. You can delete the file called REAL CAT (it just reserved space for the CATALOG on the protected disk). TELLSTAR I is the greeting program.
8) Exit from Muffin and load the greeting program.

LOAD TELLSTAR I

9) Eliminate the "POKE 214,255" from line 100.

Now if you RESET from within the program, it won't try to run itself every time you enter a command. You're finished! Grab a Pepsi and enjoy the feeling of having beaten *THE PROTECTORS* once again.

Bugs In Hardcore COMPUTIST No. 11 & 12

HC No. 11 - ULTIMA III
Ultimapper.Small Program, p. 20
Add this line: **85 LOMEM : 6144**

HC No. 12
"Softkey For Millionaire", p.7, should have been credited to Ryan Hodge. Our apologies.

Backing Up Type Attack, p. 8
The value under the column **TO** for byte $A1 was listed incorrectly. The proper value is $0A instead of $09.

NORMALIZING Laf PACK

By FERRELL WHEELER

Laf Pak
Sierra On-Line
Sierra On-Line Building
Coarsegold, CA 93614

Requirements:
Laf Pak disk
1 blank disk
1 initialized disk (preferably with a fast DOS) COPYA
Any sector editor program such as DiskEdit or ZAP

Laf Pak is a collection of four small but very enjoyable and playable games. Number one in the pak is Creepy Corridors, a maze type game that is by far the most fun, especially with the hilarious sound effects. Apple Zap is a four way shoot'em up game. Space Race is a game in which you race an opponent or the computer through a multitude of little bird-like aliens. Finally, Mine Sweep is an almost impossible game in which you try to clear a mine field in a given amount of time.

In trying to backup this disk, I first noted that the publisher was Sierra On-Line. Many companies use a standard copy protection method on most of their products and I figured Laf Pak was protected, like most of their other products, with a nibble count on track Ø. This turned out to be true. A check is made at the beginning of each of the individual games. It is always helpful to know of a company's past methods of copy protection when trying to unlock any of their software. For example, the original Zork crack published in Hardcore COMPUTIST No. 1 still works for all of Infocom's adventures, almost all of Automated Simulations software can be DeMuffined, and the boot code for Hard Hat Mack that was revealed in Hardcore COMPUTIST No. 5 can be used on some other Electronic Arts games. So always keep this in mind and don't throw away your back issues of Hardcore.

To disable the the disk checking routines for Laf Pak, I simply had to find the first JSR (a subroutine call) at the beginning of each of the games and replace it with NOP's (no operation). For example: Creepy Corridors starts at $8ØØ and at $8Ø8 there is a JSR $1B33 which is the call to the disk verification scheme. In machine code this code is 2Ø 33 1B, so I simply used a disk searcher to find these three bytes on the Laf Pak disk. With Laf Pak this can easily be done since the disk is written in standard DOS 3.3 format. I found similar calls in the other three games and recorded the locations of all the bytes that needed to be changed to EA (op code for NOP). So, to backup Laf Pak simply use COPYA to copy the entire disk (always write-protect your original first!). Then use a sector editing program to make the following changes to the backup.

TRK	SECT	BYTE	FROM	TO
4	Ø	8	2Ø	EA
4	Ø	9	33	EA
4	Ø	A	1B	EA
14	Ø	D	2Ø	EA
14	Ø	E	ØD	EA
14	Ø	F	72	EA
9	2	F	2Ø	EA
9	2	1Ø	7C	EA
9	2	11	13	EA
C	7	F	2Ø	EA
C	7	1Ø	33	EA
C	7	11	17	EA

You now have a completely unprotected backup of Laf Pak which can be copied with any standard copier. If this is all you want you can stop here, but I wasn't satisfied because using a full disk for a backup of a game is usually a waste of disk space. I wanted each game normalized, i.e. BRUNable and FIDable. I also wanted the Laf Pak machine to work as normal from a standard binary file.

Normalizing each game will illustrate the method of using memory moves to compact binary files and will also illustrate how to pass commands to DOS from within machine language programs. When we are done there will be plenty of room on the disk for any other games you want to store with Laf Pak.

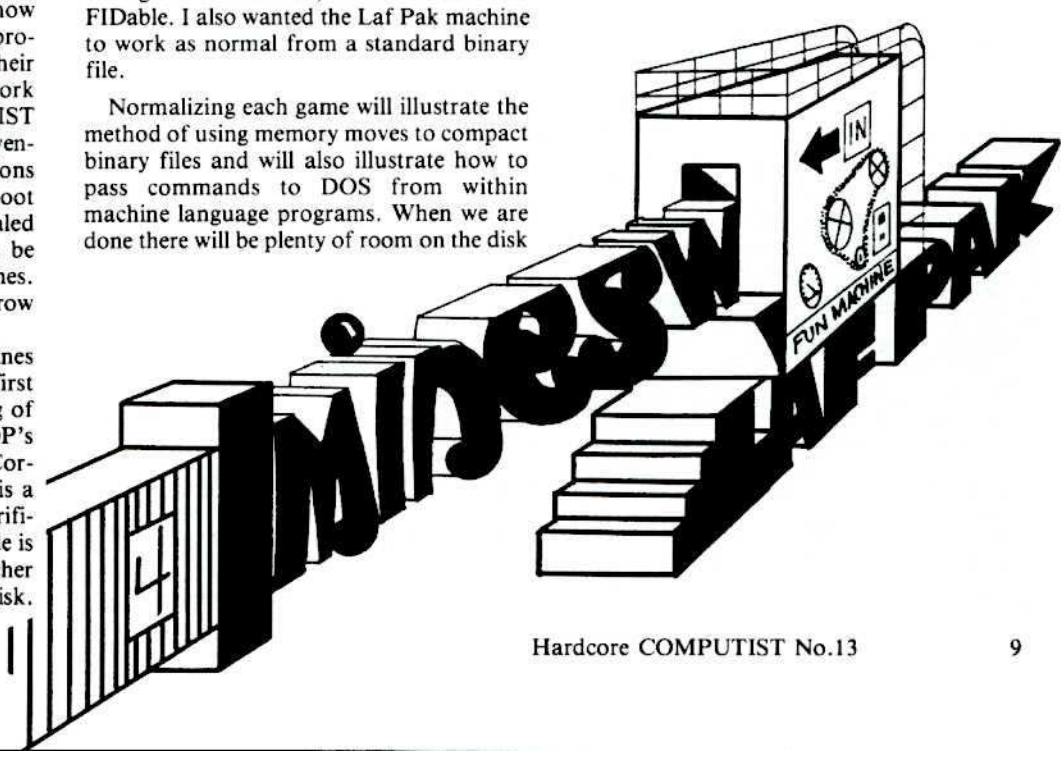
The first thing to do, while the sector editor is still handy, is to change the name of the file that is run on boot up. It is named LAF PAK, but is preceded with 7 CTRL-H's. Since we will want to load this file in from hand, we need to get rid of the control characters. Use your sector editor to read in track 11, sector F and, beginning with byte ØE, type in LP (that's CC DØ in hex) and enough spaces (AØ in hex) to cover the 7 CTRL-H's (88 in hex) and the ASCII codes for "LAF PAK". Write this sector back to disk. Now when you CATALOG your backup LAF PAK disk, the first file should be a 4 sector binary file named LP.

Before we actually begin you need to boot your initialized disk, type in the following code at $8ØØ and save it as PAGE MOVER.

CALL -151

```
800:A2 00 A0 FF 84 3E C8 84
808:3C 84 42 BD 25 08 85 43
810:E8 BD 25 08 85 3D E8 BD
818:25 08 85 3F E8 20 2C FE
820:E0 06 D0 DE 60 00 00 00
```

BSAVE PAGE MOVER,A$8ØØ,L$28



In assembly language this looks like:

```
0800-  A2 00      LDX   #$00
0802-  A0 FF      LDY   #$FF
0804-  84 3E      STY   $3E
0806-  C8         INY
0807-  84 3C      STY   $3C
0809-  84 42      STY   $42
080B-  BD 25 08   LDA   $0825,X
080E-  85 43      STA   $43
0810-  E8         INX
0811-  BD 25 08   LDA   $0825,X
0814-  85 3D      STA   $3D
0816-  E8         INX
0817-  BD 25 08   LDA   $0825,X
081A-  85 3F      STA   $3F
081C-  E8         INX
081D-  20 2C FE   JSR   $FE2C
0820-  E0 06      CPX   #$06
0822-  D0 DE      BNE   $0802
0824-  60         RTS
```

This routine uses the monitor's move subroutine at $FE2C (note the Y-register must be Ø on entry) to perform block page moves where a page is considered to be 256 bytes starting at an address of the form XXØØ, i.e. the low order byte is ØØ. If $8ØØ is considered the first byte of the routine, then the "table" begins at byte $825. A table entry is 3 bytes designating which pages to move and where. For example- if I wanted the monitor to perform the following move:

11ØØ<22ØØ.33FFM

the table entry would be

825:11 22 33

You can have as many as 85 table entries but you must set byte $21 to 3 times the number of memory moves to be performed (in other words, set it to the total number of bytes in the table). As long as you load this code on a page boundary, then bytes $ØD, $13 and $19 are the only bytes you have to change to relocate the code. These locations should hold the high byte of the page to which you relocate the code. If you are using an assembler, you can make all of these changes in the source code by simply changing the origin and the contents of the table.

Our goal is to have 5 binary files, the 4 games and the menu or "Fun Machine" file which we will name LAF PAK. We will change the menu file to simply BRUN the selected game instead of loading it in directly from disk as it does on the original disk. On the original, when you are playing any of the games and you hit <**ESC**>, the game will BRUN a file called BOOT.OBJ which in turn loads in the menu. We will simply change each game to BRUN LAF PAK instead of BOOT.OBJ.

The first thing we need to do is to save each of the games. I will illustrate all of the steps in detail for the first game, Creepy Corridors.

Creepy Corridors

1) Boot the initialized disk on which you saved PAGE MOVER (preferably a disk with a fast DOS on it). Insert your Laf Pak backup, load the boot up file LP and get into the monitor.

BLOAD LP
CALL -151

2) LP starts at $14ØØ where it first reads in the I/O routine at $22Ø. Whatever the accumulator is holding on entry to $22Ø determines which game (or the menu) is to be loaded. A Ø means Creepy Corridors and a 4 means the menu. At $1438, the accumulator is loaded with 4 (indicating that the menu is to be loaded) and a jump is made to $22Ø. We can change this JMP instruction (4C in hex) to a 6Ø (RTS) so that the I/O routine will be loaded, but not executed. To do this type

143A:6Ø N 14ØØG

Upon examination of the I/O routine at $22Ø, you can see that each game and the menu are loaded in three seperate chunks. The destination addresses and the number of pages to be loaded in each chunk are given in the tables at $2FA and $2EB, respectively. With this information and a little bit of hexadecimal addition, the following addresses can be determined:

Creepy Corridors:
$8ØØ-$1CFF, $4ØØØ-$5FFF & $7ØØØ-$94FF
Space Race:
$8ØØ-$15FF, $6ØØØ-$6EFF & $8ØØØ-$93FF
Mine Sweep:
$8ØØ-$1EFF, $4ØØØ-$5FFF & $87ØØ-$94FF
Apple Zap:
$4ØØØ-$5FFF, $6ØØØ-$7EFF & $7DØØ-$8CFF
Fun Machine (Menu):
$8ØØ-$EFF, $4ØØØ-$6ØFF & $9ØØØ-$94FF

3) We are going to let the Laf Pak routine read in each game, then stop it before it jumps to the beginning of each game. This is done by changing the JMP at $28A to a RTS.

28A:6Ø

4) Now we just need to load the accumulator with Ø for Creepy Corridors and jump to $22Ø. This is done by changing the code at $1438 so that the accumulator will contain a Ø when the I/O routine executes.

1439:ØØ 4C N 1438G

5) The code is now in, so let's change BOOT.OBJ to LAF PAK so the menu will be loaded if the <**ESC**> key is hit.

14C5:CC C1 C6 A0 D0 C1 CB A0

6) We next can compact the 3 chunks of code into one contiguous block with the following memory moves.

1DØØ<4ØØØ.5FFFM
3DØØ<7ØØØ.94FFM

7) Since PAGE MOVER will live at the end of the block (at $62ØØ), we need to call this subroutine before the main program is run. So we put a JSR $62ØØ at the beginning of the code.

7FD:2Ø ØØ 62

8) Now insert the initialized disk with PAGE MOVER on it, load it in and change it so that it will run at this new location.

BLOAD PAGE MOVER,A$62ØØ
62ØD:62 N 6213:62 N 6219:62

9) Note that the inverse of the moves made in step 6 are 7ØØØ<3DØØ.61FFM & 4ØØØ<1DØØ.3CFFM, which give us the table entries for the move code.

6225:7Ø 3D 61 4Ø 1D 3C

1Ø) Now, simply save the game.

BSAVE CREEPY CORRIDORS,
A$7FD,L$5A8Ø

You now have a completely normalized Creepy Corridors game which can be BRUN to your heart's content. Before going on, you should test it by first clearing memory and then running it from disk. An easy way to clear memory without turning your Apple off is by typing:

8ØØ:ØØ N 8Ø1<8ØØ.95ØØM

If something goes wrong, BLOAD the file and check the code at $62ØØ for any typos.

In case you got lost along the way, here are the basic steps we performed in order to capture a compacted version of Creepy Corridors.

A. Load the game into memory
B. Compact the game code into one contiguous area of memory

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C. Append the PAGE MOVER routine onto the end of the compacted code and fix it so it will run properly there
D. Put the proper values into the PAGE MOVER table
E. BSAVE the game after inserting some code at $7FD that calls the PAGE MOVER routine before the game tries to execute

When the game is BRUN the first thing that happens is call to the PAGE MOVER routine to "decompact" the code.

For the other three games, the steps are very similar to those we performed for Creepy Corridors.

Space Race

Steps 1-3 are the same as for Creepy Corridors.

4) The Accumulator should hold a 1 so that Space Race will be loaded.

1439:01 4C N 1438G

5) Change BOOT.OBJ to LAF-PAK.

962:8D 84 C2 D2 D5 CE A0 CC
96A:C1 C6 A0 D0 C1 CB

6) Compact the game's code with the following memory moves.

1600<6000.6EFFM
2500<8000.93FFM

7) Insert the code which calls the PAGE MOVER routine.

7FD:20 00 39

8) Insert the initialized disk, load the move routine and relocate it.

BLOAD PAGE MOVER,A$3900
390D:39 N 3913:39 N 3919:39

9) Put in the table for PAGE MOVER.

3925:80 25 38 60 16 24

10) Save the game.

BSAVE SPACE RACE,A$7FD,L$3180

Mine Sweep

Steps 1-3 are the same.
4) The accumulator should hold a 2 so that Mine Sweep is loaded in.

1439:02 4C N 1438G

5) Change BOOT.OBJ to LAF PAK.

96D:CC C1 C6 A0 D0 C1 CB A0

6) Compact the code with the following memory moves.

2900<800.1EFFM
6000<8700.94FFM

7) Insert some code which calls the PAGE MOVER routine and jumps to the start of the game.

28FA:20 00 6E 4C 00 08

8) Insert the initialized disk, load PAGE MOVER and relocate it.

BLOAD PAGE MOVER,A$6E00
6E0D:6E N 6E13:6E N 6E19:6E

9) Install the memory move table at $6E25.

6E25:87 60 6D 08 29 3F

10) Finally, save the game.

BSAVE MINE SWEEP,A$28FA,L$4580

Apple Zap

Steps 1-3 are the same.
4) The accumulator should hold a 3 so that Apple Zap is loaded.

1439:03 4C N 1438G

5) Change BOOT.OBJ to LAF PAK

63BD:CC C1 C6 A0 D0 C1 CB A0

6) No moves are necessary since the code is already contiguous.

7) Insert the code which jumps to the beginning of the game.

3FFD:4C 00 60

Steps 8-9 are not needed because PAGE MOVER is not used with this game.
10) Insert the initialized disk and save the program.

BSAVE APPLE ZAP,A$3FFD,L$4D03

Before we move on to the menu program, I would like to note that Mine Sweep, Apple Zap and the menu all store standard hires pictures at $4000-$5FFF. Those of you who are ambitious and wish to save about 50 more disk sectors can pack these pictures and insert the unpacking routine with them to make these files even more compact. If you just want to be able to BRUN each of the games and do not care about the "Fun Machine" menu, then you have completed this task and you can stop here. But if you would like to use the menu program on occasion, then read on.

The Fun Machine

Capturing the menu program is similar to the above except that we must intercept the jump to the I/O routine to load in a game and replace it with our own BRUN routine. At $862, the number of the game that is chosen is utilized to get an address from an address table at $D62. This address is stored in $00.$01 which is used as a vector to the correct entry into the I/O routine. We will place our own address table at $D62 so that $00.$01 becomes a pointer to the correct game that should be run. We will then print out BRUN with the code:

```
86C- LDY #$06
86E- LDA $0879,Y
871- JSR $FDED
874- DEY
875- BNE $086E
877- JMP $0E30
87A- N U R B <CTRL-D> <RET>
```

At $E30, we will place a routine that uses the address in $00.$01 to print the name of the game. The code to do this looks like:

```
E30- LDY #$00
E32- LDA ($00),Y
E34- JSR $FDED
E37- INY
E38- BNE $0E32
```

The result is that DOS will BRUN the desired game from the Fun Machine menu. All of the steps are summarized as follows:
Steps 1-3 are the same as above.
4) The accumulator should hold a 4 so that the menu is loaded.

1439:04 4C N 1438G

5.1) Type in the code below which will print out the DOS command BRUN (preceded by a carriage return and a CTRL-D).

86C:A0 06 B9 79 08 20 ED FD 88 D0
876:F7 4C 30 0E CE D5 D2 C2 84 8D

5.2) Type in this code which will print out the name of the game to be run.

E30:A0 00 B1 00 20 ED FD C8 D0 F8

5.3) Next, install in memory a table which contains the names of the four games (each followed by a carriage return)

E40:C3 D2 C5 C5 D0 D9 A0 C3
E48:CF D2 D2 C9 C4 CF D2 D3
E50:8D C1 D0 D0 CC C5 A0 DA
E58:C1 D0 8D D3 D0 C1 C3 C5
E60:A0 D2 C1 C3 C5 8D CD C9
E68:CE C5 A0 D3 D7 C5 C5 D0
E70:8D

5.4) Now, put the addresses of the names in the address table.

D62:40 0E 51 0E 5B 0E 66 0E

6) Compact the menu code with the following memory moves.

F00<4000.60FFM
3000<9000.94FFM

7) Insert the code which calls the PAGE MOVER routine.

7FD:20 00 0E

8) Insert the initialized disk, load the PAGE MOVER and relocate it.

BLOAD PAGE MOVER,A$E00
E0D:0E N E13:0E N E19:0E

9) Install the PAGE MOVER table.

E25:40 0F 2F 90 30 34

10) Of course, we also have to save the compacted code for the menu.

BSAVE LAF PAK,A$7FD,L$2D03

Now you have a completely normalized Laf Pak that you can put on any one of your game disks. I hope the techniques I have illustrated will come handy when you are trying to normalize other copy-protected games.

*See No. 15, page 5 - modified SWAP CONTROLLER -
**See No. 16, page 4 - (letter) - additional suggestions & values

BEYOND CASTLE WOLFENSTEIN

By Ray Darrah

Requirements:
Super IOB & swap controller
Blank disk

Beyond Castle Wolfenstein is a highly improved version of the original Muse program, Castle Wolfenstein. This newer version has better voice synthesis, smoother graphics and higher playability. The program will also utilize a 16K RAM card for the storage of the castle so that no disk access is required when moving from room to room.

Unfortunately, Muse is still copy protecting their programs. Since I was anxious to perform some APTs, I decided to deprotect the game.

The Softkey

The softkey is performed quickly with a little help from the Super IOB swap controller:

1) Begin by booting Beyond Castle Wolfenstein.

PR#6

2) The instant you see the Applesoft prompt, hit RESET. The computer should then beep and put you in the monitor.

3) Move the Wolfenstein RWTS out of the way so we can boot a slave disk.

1900<B800.BFFFM

4) Boot your 48K slave disk (Super IOB disk).

6^{CTRL}P

5) Save the RWTS from Beyond Castle Wolfenstein.

BSAVE RWTS.BEYOND WOLF, A$1900, L$800

6) Remove your Super IOB disk. Put a blank diskette in the drive and Initialize it.

INIT HELLO

7) Install the controller printed at the end of this article into Super IOB and RUN it.

8) Follow the prompts and do NOT format the backup.

9) When the copy is done, clear the program in memory.

FP

10) Type this short greeting program.

```
10 POKE 1010,105 : POKE 1011,255 :
   POKE 1012,90
20 PRINT CHR$(4)"BRUN^@INIT"
```

11) Save it on the copy of Beyond Castle Wolfenstein.

SAVE HELLO

Easy wasn't it! It almost makes you wonder why they bothered copy protecting the game in the first place.

You now have a working COPYAable backup of Beyond Castle Wolfenstein. I suggest you put the original in the vault in your basement (or your bunker) and make a couple of copies of the backup before trying any of the APTs that follow.

HELLO!

The three POKES in the HELLO program set up the RESET vector so that when the RESET key is hit you will be placed in the Apple's monitor. This will allow you to perform some Advanced Placing Techniques that would have made a high-ranking officer of Waffen SS drool with envy.

The Map

The file BACKUP contains all the information about the standard castle, while the file CASTLE contains all the information about the current castle. Therefore, at the beginning of a mission in the standard castle the files BACKUP and CASTLE are identical.

Room Definitions

When BACKUP is BLOADed (A$4004), the 61 room definitions each occupy 256 bytes starting at $4100. If you wish to sector edit the file, each room definition occupies one sector starting with the second sector of the file.

Each room, except the first one, is defined with four exits. However, when the main program draws a room, it blocks the exits that don't lead to another room.

A new castle is created by changing the contents of each room and then shuffling the room definitions. This means that when you're playing a game with a different castle, you will encounter the same rooms, only in different places and with different objects in them.

Bytes $00 through $47 of each 256 byte long room definition define its walls. Each room is drawn on an eight by nine matrix with the seventy two squares having overlapping edges. The lower four bits of each byte in this area state whether to draw a specific wall of a particular square or not.

To see this, boot up the game and press RESET as soon as you are placed in the first room.

Now let's erase the wall definition of this room (while playing a game, the current room definition resides at $4000 through $40FF)

4000:00
4001<4000.4046M

To see this completely blank room, type 1290G, but don't leave the room as you will go to strange places and most assuredly not get back. When you finish looking at this bland site, hit RESET to get back into the monitor.

Now let's fully illuminate the upper left and lower right squares:

4000:0F
4047:0F
1290G

Entire squares lit up because all of the lower four bits were set to 1. If you don't want an entire square, then a value representing which walls you want illuminated should be stored in bytes $00 through $47. Bit 0 controls the left wall, bit 1 controls the right wall, bit 2 controls the top wall and bit 3 controls the bottom wall.

If you would like to design your own wall definitions, remember that the squares overlap. To see this, set $4000 and $4001 to $0F and type 1290G.

Which Room Is Where?

The rooms are numbered. When BACKUP or CASTLE is BLOADed, room one is at $4100 (1st in the file), room two is at $4200 (2nd in the file), and so on. Bytes $49

*** see No.16, page 19 (fix for this SOFTKEY)

through $4C of a room definition hold the numbers of the rooms to the left, right, top, and bottom, respectively. If one of these bytes is less than one or greater than sixty-one, then there is no room in that direction and when the room is drawn the corresponding exit will be blocked.

The Items In The Room

Bytes $80 through $FF contain definitions of the items in this room. As far as I can tell, each item (except closets) take up eight bytes. Closets seem to occupy sixteen bytes. With this assumption, the table below gives the offsets in the sector (or page of memory) for each of the item definitions:

Item	Bytes	Item	Bytes
1	$80 - $87	9	$C0 - $C7
2	$88 - $8F	10	$C8 - $CF
3	$90 - $97	11	$D0 - $D7
4	$98 - $9F	12	$D8 - $DF
5	$A0 - $A7	13	$E0 - $E7
6	$A8 - $AF	14	$E8 - $EF
7	$B0 - $B7	15	$F0 - $F7
8	$B8 - $BF	16	$F8 - $FF

In each of these item definitions, the first byte determines what the item is and the second byte is a value from $00 to $3F that determines where it will appear in the room. As far as Beyond Castle Wolfenstein is concerned, there are sixty-four positions in each room for either you, a German or some other item. Position $00 is the upper left corner, position $07 is the upper right corner and position $3F is the lower right corner.

Here are the possible values that byte zero of the item definitions can hold:

Value	Item	Value	Item
$10	Alive Guard	$40	Dead Guard
$20	Closet	$50	Desk Clerk
$30	Alarm Button	$60	Super Wall

I haven't determined what the other bytes in the item definitions are for. However, I do know that byte $02 of a closet definition holds a value representing what will be found in the closet. These values are:

Value	Contents	Value	Contents
$01	Bullets	$09	Hitler's Diary
$02	Money	$0A	Alarm Controls
$03	Passes	$0B	Dagger
$04	Powder Kegs	$0C	First Aid Kit
$05	Coat Check	$0D	Tool Kit
$06	Art Objects	$0E	Secret Passage
$07	Keys1	$0F	The Bomb
$08	Keys2		

I also know that byte $04 determines whether the closet is open or not. An open closet will have a value of $00 and a closed closet will have a value of $F0.

To Help You Along

To aid you in the conquering of Beyond Castle Wolfenstein, here are some helpful APTs. All of them require you to press RESET before performing them. If no command is specified, start the program by typing

1200G (get going again)

If ever you feel that the number of bullets in your revolver is inadequate for the massacre ahead of you, RESET into the monitor and type

4347:0A (# of bullets)

This will give you ten bullets. You may put any hex number from $00 to $FF here. Numbers greater than ten will be displayed on the inventory screen as ten bullets but you will really have how ever many you typed.

If you prefer to be a slaughtering machine, infinite bullets can be obtained by typing

15AE:EA EA EA (infinite bullets)

Perhaps you're not the killer type. Maybe you would rather bribe everyone. If this is the case, then you may alter the amount of money you have at any time by typing

434B:64 (amount of money)

This will give you 100 marks because $64 is 100 in decimal. Care must be taken not to give yourself more than 100 marks. If you have more than 100 marks when you try to bribe someone, you will be recognized.

Again on the milder side, the passes are stored at location $4360. The lower five bits are 1 if you have that pass and zero if you don't. Therefore, if you wish to have every pass, you would type

4360:1F (which passes)

Instantly, you can aquire a dagger or a tool kit by changing the following values from $00 to $FF:

4306:FF (dagger)
4307:FF (tool kit)

If, with all this, you still manage to get injured, you can obtain a first aid kit by typing

4308:02 (number of bandages)

This will give you two bandages. You may enter as many bandages as you like. As long as you have at least one bandage left, there will be a first aid kit on the inventory screen.

On the other hand, if you don't wish to bother bandaging yourself every time you get shot, then you can try:

59BA:EA EA EA (forever healthy)

This will have the effect of nulling all wounds. This means that the game will still tell you when you are injured, but you won't slow down when you walk. You see, location $432B holds the delay constant to be used when you walk. A zero is no delay and you can walk fine. This value is changed to $16 the first time you are injured with the effect of making you limp. When you are severely wounded, this location holds a $76 which makes the delay routine wait a long time

Continued on page 27

Most Wanted List

If you have been trying to backup a program, and have only ended up pulling your hair out as a result of the ordeal, let us know about it.

We have received softkeys for a number of programs previously in our list and these will be published as soon as each has been evaluated and edited by our staff.

Hardcore COMPUTIST
Wanted List
POB 44549K
Tacoma, WA 98444

If you know how to de-protect, unlock or modify any of the programs below, we encourage you to help other Hardcore COMPUTIST readers and earn some extra money at the same time. Send the information to us in article form on a DOS 3.3 diskette.

1. **Apple Business Graphics**
Apple Computer
2. **Flight Simulator II**
Sub Logic
3. **DB Master 4.0**
Stoneware, Inc.
4. **DB Master 4.0 +**
Stoneware, Inc.
5. **Bookends**
Sensible Software
6. **Crossword MAGIC**
L & S Computerware
7. **Visiblend**
Micro Lab
8. **BPI General Ledger**
Apple Computer
9. **Dollars And Sense**
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10. **Word Juggler**
Quark, Inc.
11. **Catalyst**
Quark, Inc.
12. **Rocky's Boots**
The Learning Company
13. **Gutenburg Jr. & Sr.**
Micromation LTD
14. **Prime Plotter**
Primesoft Corp.
15. **The Statistics Series**
Human Systems Dynamics
16. **MASTER TYPE**
Scarborough Systems
17. **Sargon III**
Hayden
18. **Dow Jones Market Analyzer**
Dow Jones Software
19. **Zardax**
Computer Solutions
20. **Stickybear Series**
Xerox Education Publications
21. **List Handler**
Silicon Valley Systems

Softkey For Transylvania & The Quest

By Thomas A. Phelps

Requirements:
Apple][,][+, //e, or compatible
Three blank disk sides
(one for Transylvania and two for The Quest)
Transylvania and The Quest disks

As you are aware, both Penguin Software and Beagle Bros are spoken of highly for their unprotected applications disks. Even the Beagle game disk Beagle Bag bears no protection. Penguin game disks, on the other hand, are copy-protected, thus not allowing easy backup nor the art of APT.

Arcade games in broken form do not especially lend themselves well to APT due to difficult to understand machine code, but adventures, especially ones written in BASIC, do. After performing the softkey for both Transylvania and The Quest you can examine the BASIC programs which are the core of these fine adventures, as well as each well-drawn picture without the need of traveling there in the adventure itself.

The protection for these adventures is more or less the same, and is easily broken with just a little effort. First, type in the following Super IOB controller. Since this controller works on all Penguin entertainment software I've tried (including such releases as Coveted Mirror), save it to disk as PENGUIN.CON.

After using the controller on a Penguin disk, you should add DOS (ideally HYPER-DOS from the Hardcore flyer or Update 3.2 of the old series). Now follow the softkeys to unlock Transylvania and The Quest, and enjoy the APT's!

Transylvania Softkey

First, run Super IOB with the Penguin controller installed. Once the program has been copied only one modification needs to be made for the program to function. The Binary file TPAR checks to see that $D6 is nonzero (causing the BASIC program to autorun). If it is not nonzero, the program will exit to BASIC as soon as the player is ready to enter his first command. This problem can be fixed in either one of two ways. One way is to add "5 POKE 214,255" to HELLO, or, better yet, the file TPAR can be modified to ignore this check. To modify TPAR, follow these steps:

1) Since TPAR loads in an area normally used by DOS buffers, change Maxfiles

MAXFILES1

2) Load in the file to be modified

BLOAD TPAR

3) Enter the monitor

CALL - 151

4) NOP the $D6 byte check

943D:EA EA EA

5) Save the new file

BSAVE TPAR,A$9400,L$69D

For a complete, stand-alone copy, simply copy DOS onto the disk and use HELLO as the boot-up program.

According to the VTOC, the disk has no free sectors, but a VTOC rebuilder will show several free sectors which may be used to store saved games and the APT programs below (no extra disk needed!).

APT For Transylvania

In addition to this bit of protection, TPAR contains a list of all the words the adventure understands. A utility that prints out disk files, or the program below will print a complete list of recognized words if TPAR is in memory (the periods just fill out commands requiring less than five letters).

Print Commands

```
5 PR# 1 : PRINT
10 ST = 38281 : EN = 37888 + 1693
15 COL = 80 : REM # COLUMNS PRINTER
    SUPPORTS, SET TO FIVE FOR EACH
    RECOGNIZED WORD TO BE ON ITS OWN
    LINE
20 FOR I = ST TO EN : PRINT CHR$ ( PEEK
    (I) );
30 NN = NN + 1 : IF NN = COL THEN PRINT
    CHR$ (13) : NN = 1
40 NEXT I : PRINT CHR$ (13)
45 PR# 0
```

Checksums

```
5     - $D66E     30    - $84BF
10    - $F8CD     40    - $BC63
15    - $6A49     45    - $D328
20    - $32D2
```

Examining the BASIC program TRANS will give you some clues and show some interesting program techniques; it's worth looking at.

Another benefit of unlocking this Transylvania is that the beautiful hi-res pictures can be enjoyed without the bother of traveling through the entire adventure. Owners of the Graphics Magician can load up the pictures just as if they were any other picture created with the picture editor, or those without can use the following program to take a look at the pictures (save to the Transylvania disk under SEE PICTURES).

See Pictures

```
10 IF PEEK (103) + PEEK (104) <> 65
    THEN POKE 103,1 : POKE 104,64 :
    POKE 16384,0 : PRINT CHR$ (4)
    "RUN^SEE^PICTURES"
20 TEXT : HOME : HGR : PRINT CHR$ (4)
    "BLOADPICDRAW2"
30 HOME : VTAB 21 : INPUT "SEE^
    PICTURE^->^" ;A$ : IF LEFT$ (A$
    ,3) <> "CAT" THEN 50
40 TEXT : HOME : PRINT CHR$ (4)
    "CATALOG" : PRINT : PRINT "ANY^
    KEY^" ; : GET A$ : PRINT A$ : HGR :
    GOTO 30
50 IF A$ = "" OR A$ = "END" THEN TEXT :
    HOME : END
60 PRINT CHR$ (4) "BLOAD^" A$
    ",A4608" : POKE 2560,0 : POKE
    2561,18 : CALL 2608
70 GOTO 30
```

Checksums

```
10    - $2437     50    - $C073
20    - $37EF     60    - $03F6
30    - $E771     70    - $EC38
40    - $374A
```

The possibilities for modification are endless; you can even modify the adventure map!

The Quest Softkey

The softkey for The Quest is less complex than the softkey for Transylvania. You need to use the Penguin controller on the boot side of the disk and, interestingly enough, only COPYA on the back side.

After that, a couple of modifications need to be made. First of all, the boot program needs to be changed so that a file called AMP 2.8 can be BLOADed into the DOS buffers. Type the following:

```
FP
10 PRINT CHR$(4) "MAXFILES1" :
   PRINT CHR$(4) "BRUN QUEST
SAVE QA
```

Copy DOS onto the disk and use QA as the boot-up program.

The next modification concerns a check to see if Penguin DOS is still in the machine. The check occurs in line 9120 of a program called QB so

LOAD QB

Change the Z = PEEK (47092) in line 9120 to a Z = PEEK (47093) and then

SAVE QB

Like Transylvania, the disk shows no free sectors, but a CATALOG rebuilder (such as

FIXCAT from Bag of Tricks which was unlocked in Hardcore Computist No.3) will recover the unused sectors which can now be used for saved games.

APT For The Quest

The end of this adventure is much, much better than that of Transylvania. In fact, to see the end without toiling with the adventure, flip the disk to side two and BRUN EQA. Excellent work on the part of the authors and on the COPYAble side - interesting.

Again, all the hi-res pictures may be viewed but, disappointingly, many are duplicates. The BASIC program MQ can also be examined to aid in solving this adventure.

Final Word

As I mentioned earlier, Super IOB works on other Penguin game disks as well. For example, running Super IOB on Minute Man and simply changing line one to "1 HOME: HGR: HGR2: PRINT CHR$(4) "MAXFILES1" will create an unlocked Minute Man which, of course, may be copied with COPYA or any other copier, even FID!

Well, that's it! Watch for the return of three mice in The Quest, and have fun!

Penguin Controller

```
1000 REM PENGUIN CONTROLLER
1010 TK = 2 :ST = 0 :LT = 35 :CD = WR
1020 T1 = TK : GOSUB 490 : GOSUB 1110
1030 GOSUB 430 : GOSUB 100 :ST = ST + 1
     : IF ST < DOS THEN 1030
1040 IF BF THEN 1060
1050 ST = 0 :TK = TK + 1 : GOSUB 1110 :
     IF TK < LT THEN 1030
1060 POKE 47505 ,222 : POKE 47413
     ,222 : GOSUB 230 : GOSUB 490 :TK =
     T1 :ST = 0
1070 GOSUB 430 : GOSUB 100 :ST = ST + 1
     : IF ST < DOS THEN 1070
1080 ST = 0 :TK = TK + 1 : IF BF = 0 AND
     TK < LT THEN 1070
1090 IF TK < LT THEN 1020
1100 HOME : PRINT : PRINT "DONE^
     WITH^COPY" : END
1110 POKE 47505 ,218 : POKE 47413
     ,218 : IF TK / 2 = INT (TK / 2 )
     THEN 230
1120 RESTORE : GOTO 190
63010 DATA 212 ,170 ,150
```

Controller Checksums

```
1000  - $356B      1070  - $5C4D
1010  - $3764      1080  - $E4C6
1020  - $B2CC      1090  - $7942
1030  - $A4CD      1100  - $7EA2
1040  - $34F8      1110  - $C0B7
1050  - $7477      1120  - $CFA4
1060  - $5448      63010 - $58A1
```

ADVENTURE TIPS ADVENTURE TIPS

***Enchanter**
Infocom

Frogs have some valuable information if you can only understand them.
Turtles can help in a "smashing" situation.
Printings change their appearance when it's dark.
Mouse holes have unique furnishings.
Can reflections be real?
When treasure talks, adventurers listen.

***Gruds In Space**
Sirius Software

In many situations, asking for "help" can be an asset.
People don't like guns.
Ropes can help you out of a "sticky" situation.
Gruds with ropes don't like thieves.

***Planetfall**
Infocom

Don't exceed the speed limit.
Floyd has arms. Why not put them to use?
Ladders can be used for things other than climbing.
Lights and liquids are related.
Floyd's friend could be repaired if he had a breastplate transplant.
Spare parts are useful.

* *Contributed By Michael Bouck*

†Quest
Penguin Software

Witches like jewelry.
Caves can be reached by carpet.
The sphinx has a trick question.
Take the rug to the southern islands.
Tie the rope before descending the pit.

†Sherwood Forest
Phoenix Software

Single men don't have anything.
Taxmen are fit to be robbed.
Beggars like gold.
Silver threads make good lute strings.
Merry men like music, worst to best.
Pools of water are good for face washing.

† *Contributed by Henry Ou*

Zork II
Infocom, Inc.

Ice will melt if you add enough heat.
"High" is "deep" upside down.
Dragons capture princesses and their fire is very hot.
There are things inside the gazebo.

Contributed by Cullen Johnson

‡Zork III
Infocom, Inc.

Rusty lanterns don't work.
See his face before he dies.
The chest keeps everything safe, from staffs to torches.
The old man is hungry.

‡Starcross
Infocom, Inc.

The spider is really bored. Give him something.
Guns don't misfire for no reason at all.
You can't follow the mouse home.
Well, not through the front door anyway.
Get sunglasses before looking into the light.

‡Suspended
Infocom, Inc.

The men can help you reach where your robots can't.
Better listen to what the men say.
You'll need to salvage parts.
Acid kills robots. Get it turned off.

‡ *Contributed by Tan Wee Meng*

Infidel
Infocom, Inc.

Get plenty of water from the Nile.
You can drop the shovel when you get into the pyramid, but keep the pick.
When you place the gems on the coffin, make sure that they are in the right order.
Don't try to refuel your torch while on the boat. It might catch fire.
On the other hand, be sure to refuel it when the light dims; it's no fun being in a pitch-dark pyramid.
The chest might be weak enough to break open with a rock.

Contributed by Chris W. Cowell

* see No. 16, page 26 - always use FP (NOT NEW) to clear Applesoft programs.

CORE

CSaver: The Advanced Way To Store Super IOB Controllers

By Ray Darrah

Requirements:
Apple][with Applesoft in ROM
16k RAM (or language) card
DOS 3.3 (not PRODOS)

After reading Ken Burnell's letter in Hardcore COMPUTIST No. 12, I realized that saving Super IOB controllers with "The Controller Saver" from Hardcore COMPUTIST No. 10 isn't as convenient as &Holding and &Merging them. Therefore, in my spare time I wrote CSAVER (pronounced "See saver") which adds the capability of holding programs and merging them.

Typing It In

Entering the CSAVER is quite simple. Merely type in the hexdump at the end of this article and

```
BSAVE CSAVER,A$4000,L$111
```

To install the CSAVER, type

```
BRUN CSAVER
```

It will appear as if nothing has happened to your precious computer but, in fact, all kinds of strange and wondrous events have occurred: Your entire language card has been filled with the image of your Applesoft ROMS; a small routine that hides and merges programs has been relocated into page $F7 of your language card; a short routine that calls the hider and merger at $F700 has been placed in the end of page three; and the ampersand has been revectored to the short page three routine.

How To Use The CSAVER

Once CSAVER has been installed, you should LOAD (yes, an Applesoft file) the controller and then type

```
&H
```

This will put the controller on hold and allow you to LOAD SUPER IOB. With Super IOB in memory, you should merge the programs by typing

```
&M
```

It is important to note that when the two programs are merged, the one on hold takes precedence over the one LOADed second. That is: *Lines of the program just LOADed will be overwritten (by the program on hold) where the line numbers are the same.*

CSAVER will work on most programs that you wish to merge. Just be sure to LOAD the program you wish to have precedence, first.

The Inner Workings

Those of you who get a little queasy when the conversation swings toward machine language might avoid some discomfort by skipping the following text.

When CSAVER is BRUN, the ampersand JuMP vector is set to $3B5. Next, memory locations $403D through $4057 are copied into locations $3B5 through $3CF. Third, the code from $401A through $4032 copies the Applesoft ROMs into the language card. The last thing to happen is that the main routines of the CSAVER (locations $4058 through $4110) are copied into the language card starting at $F700. This area is usually occupied by the hi-res routines HPLOT, ROT= and XDRAW etc. But since CSAVER's main routines don't use any hi-res routines while holding or merging programs, they can occupy that area.

An Encountered Ampersand

When the Applesoft interpreter comes across the ampersand, it reads one more character (from the input line or BASIC program) into the A register and JuMPs to address $3F5.

The routine at $3F5 (placed there after CSAVER is BRUN) switches the RAM card so that it is just like RAM (you can read from and write to it) and then JuMPs to $F700 which is the entry to the main routines of the CSAVER. The enabling of the language card in this manner is necessary because of a routine at $F776 that is like the CHRGET routine (at location $00B1) used by Applesoft.

The remainder of the routines in page 3 are used by CSAVER as exits. All of them start by disabling the language card and then (depending upon which exit) they JuMP to the final routines used by CSAVER.

The CSAVER Main Routines

First of all, CSAVER tests to see if a hold was specified. If not, execution continues at $F72E.

"...saving Super IOB controllers with "The Controller Saver" from Hardcore COMPUTIST No. 10 isn't as convenient as &Holding and &Merging them. Therefore, in my spare time I wrote CSAVER..."

The Hold Routine

If a hold was specified, then the code at $F704 through $F712 makes sure that the beginning of program is set $801 (i.e. a program has not already been hidden). If the program pointer isn't set to $801, then CSAVER exits via ERROR (at $3BE) which disconnects the language card and JuMPs to $FBE2 (the monitor bell routine).

Assuming the beginning of program pointer is set correctly, CSAVER then stores a $801 into the fake CHRGET routine at $F776. Next, it sets the beginning of program pointer equal to the end of program pointer and simultaneously calculates the length of the program and stores the answer in $FE and $FF. Finally, the hold routine exits via EXIT.HOLD (at $3C4) which disconnects the language card and JuMPs to the Applesoft NEW routine (at $D64B).

The Merge Routine

The code at $F72E through $F731 makes sure that a merge was specified. If not, execution goes to the ERROR routine. If a merge was specified, then the code at $F732 through $F73D makes sure that the beginning of program pointer is not set to $801. If it is, CSAVER exits via ERROR. Otherwise, the pointer to the start of variables is set equal to the end of program pointer. This has the effect of erasing all numeric variables and is necessary for the ENTER.LINE routine called later.

Next, CSAVER sets the COUT vector to point to DO.1.LIN. This must be done because the ENTER.LINE routine doesn't end

with a RTS. Instead, it prints a prompt and waits for another line to enter. Therefore, by setting the COUT vector to DO.1.LIN as soon as ENTER.LINE prints the prompt, CSAVER takes over again.

The two PLA instructions at the beginning are meant to remove the JSR to COUT (in order to print the prompt) but eliminate the JSR to the Applesoft command handler the first time through. The two JSRs to CHRGET get the line link pointer. If the MSB is zero, then we have merged the whole program and execution continues at DONE.MERGE.

If the MSB wasn't zero, then DO.1.LIN sets the entry conditions for ENTER.LINE by making LINNUM equal to the line number we wish to enter, putting the tokenized line in the input buffer and setting register Y to 5 more than the length of the line. ENTER.LINE enters the tokenized line just as if you typed it.

CHRGET gets a byte from the program on hold, increments its pointer, and returns.

DONE.MERGE starts by setting the beginning of program pointer back to $801 and then moves the merged program back to $801 via the monitor MOVE routine. It does a PR#0 (JSR SETVID) so that the COUT vector is fixed and then reconnects DOS. Next, it fixes the start of variables pointer by subtracting the length from the end of program pointer. Last, it exits via EXIT.MERGE which disconnects the language card and then JuMPs to a routine in Applesoft which fixes the linnumber link numbers.

That's all there is to hiding and merging programs.

CSAVER Hexdump

```
4000: A9 4C 8D F5 03 A9 B5 8D    $B44C
4008: F6 03 A9 03 8D F7 03 A2    $61AD
4010: 1A BD 3F 40 9D B5 03 CA    $B669
4018: 10 F7 AD 81 C0 AD 81 C0    $594C
4020: A2 00 BD 00 D0 9D 00 D0    $79B9
4028: E8 D0 F7 EE 24 40 EE 27    $CC94
4030: 40 D0 EF BD 5A 40 9D 00    $9DBC
4038: F7 E8 E0 B7 D0 F5 60 AE    $F691
4040: 83 C0 AE 83 C0 4C 00 F7    $70A6
4048: AD 82 C0 4C E2 FB AD 82    $ECF7
4050: C0 4C 4B D6 AD 82 C0 4C    $AF1F
4058: F2 D4 C9 48 D0 2A A5 67    $E75B
4060: C9 01 F0 03 4C BE 03 A4    $6877
4068: 68 C0 08 D0 F7 8D 77 F7    $B0EA
4070: 8C 78 F7 A5 AF 85 67 38    $6D09
4078: E9 01 85 FE A5 B0 85 68    $9494
4080: E9 08 85 FF 18 4C C4 03    $8E70
4088: C9 4D D0 D8 A5 67 C9 01    $F3A8
4090: D0 06 A5 68 C9 08 F0 CC    $9BA9
4098: A5 AF 85 69 A5 B0 85 6A    $250D

40A0: A9 4E 85 36 A9 F7 85 37    $D963
40A8: 68 68 20 76 F7 20 76 F7    $74A0
40B0: AA F0 29 20 76 F7 85 50    $85D5
40B8: 20 76 F7 85 51 A0 00 20    $DDAA
40C0: 76 F7 99 00 02 C8 AA D0    $9D90
40C8: F6 C8 C8 C8 C8 4C 6A D4    $DBD6
40D0: AD FF FF EE 77 F7 D0 03    $56C3
40D8: EE 78 F7 60 A5 67 85 3C    $63CF
40E0: A5 68 85 3D A9 01 85 67    $2E14
40E8: 85 42 A9 08 85 43 85 68    $5D1E

40F0: A5 AF 85 3E A5 B0 85 3F    $F51F
40F8: 20 2C FE 20 93 FE 20 EA    $AD8C
4100: 03 38 A5 AF E5 FE 85 69    $2CE4
4108: A5 B0 E5 FF 85 6A 4C CA    $DB3A
4110: 03                         $8F5A
```

CSAVER Source Code

```
03F5 AMP.VEC   .EQ $3F5      & COMMAND HANDL
     ER
FBE2 BELL      .EQ $FBE2
0067 PRG.BEG   .EQ $67       PROGRAM BEGGINI
     NG POINTER
00AF PRG.END   .EQ $AF       END OF PROGRAM
     POINTER
D64B NEW       .EQ $D64B     ROUTINE THAT DO
     ES A NEW
0069 VARTAB    .EQ $69       POINTER TO STAR
     T OF VARIABLES
0036 COUT.VEC  .EQ $36       LOCATIONS THAT
     POINT TO OUTPUT ROUTINE
0050 LINNUM    .EQ $50       USED TO DETERMI
     NE THE LINE WE ARE ON RIGHT NOW
0200 BUFF      .EQ $200      INPUT BUFFER
D46A ENTER.LINE .EQ $D46A
00B8 TXT.PTR   .EQ $B8
003C A1        .EQ $3C       MOVE FROM
003E A2        .EQ $3E       MOVE TO
0042 A4        .EQ $42       MOVE INTO
FE2C MOVE      .EQ $FE2C     MONITOR MOVE RO
     UTINE
D4F2 FIX.LINKS .EQ $D4F2     FIXES THE LINNU
     MBER LINK BYTES
FE93 SET.VID   .EQ $FE93     ROUTINE THAT DO
     ES A PR#0
00FE LEN       .EQ $FE       LENGTH OF HIDDE
     N PROGRAM
C080 RD.RAM    .EQ $C080     READ LANGUAGE C
     ARD
C082 RD.ROM    .EQ $C082     READ ROMS
C083 RD.WR.RAM .EQ $C083     RAMATIZE LANGUA
     GE CARD
C081 WR.RAM    .EQ $C081     READ ROM, WRITE
      RAM
F700 CSAVE1    .EQ $F700     CSAVE IS MOVED
     TO HERE

               .OR $4000     OUT OF THE WAY
*--------------------------------
* HOOK UP THE AMPERSAND LOCATION
*--------------------------------
4000           LDA #$4C      A JMP INSTR
4002           STA AMP.VEC
4005           LDA #$3D0-END.AMP+BEG.AMP
4007           STA AMP.VEC+1 MAKE AMPERSAND
400A           LDA /$3D0-END.AMP+BEG.AMP
400C           STA AMP.VEC+2 START OF PROGR
     AM

*--------------------------------
* PUT AMPERSAND JUMP ROUTINE INTO PAGE 3
*--------------------------------
400F           LDX #END.AMP-BEG.AMP-1
4011 MOVE.AMP  LDA BEG.AMP,X
4014           STA $3D0-END.AMP+BEG.AMP,X
4017           DEX
4018           BPL MOVE.AMP

*--------------------------------
* MOVE THE CSAVE ROUTINE INTO
* THE RAM CARD
*--------------------------------
401A           LDA WR.RAM
401D           LDA WR.RAM    TWICE!
4020           LDX #0        START AT ZERO
4022 COPY.ROM  LDA $D000,X   MOVE ROM INTO
4025           STA $D000,X   RAM CARD
4028           INX
4029           BNE COPY.ROM FINISH PAGE
402B           INC COPY.ROM+2 NEXT PAGE
402E           INC COPY.ROM+5 LDA AND STA
4031           BNE COPY.ROM NOT DONE!
4033 MOVE.CSV  LDA CSAVE,X   MOVE CSAVE
4036           STA CSAVE1,X INTO RAM CARD
4039           INX           NEXT BYTE
403A           CPX #END.CSAVE-$F700
403C           BNE MOVE.CSV UNTIL DONE
403E           RTS

*--------------------------------
* DO A HIDE OR MERGE
*--------------------------------
403F BEG.AMP   LDX RD.WR.RAM RAM CARD ON
4042           LDX RD.WR.RAM TWICE!
4045           JMP CSAVE1    PERFORM FUNCTIO
     N
03BE ERROR     .EQ $3BE
4048           LDA RD.ROM
404B           JMP BELL      BEEP!
03C4 EXIT.HOLD .EQ $3C4
404E           LDA RD.ROM
4051           JMP NEW
03CA EXIT.MERGE .EQ $3CA
4054           LDA RD.ROM
4057           JMP FIX.LINKS
     END.AMP

*--------------------------------
* START OF CSAVE ROUTINES
*--------------------------------
               .OR $F700
               .TA $405A
405A CSAVE     .EQ $405A
F700           CMP #'H
F702           BNE M.CMP     NOT AN H SO TRY
      M

*--------------------------------
* HOLD THE CONTROLLER
*--------------------------------
F704           LDA PRG.BEG   MAKE SURE PROGR
     AM
F706           CMP #1        POINTER IS AT $
     801
F708           BEQ TRY.MSB   O.K. SO FAR
F70A HOLD.ERR  JMP ERROR     ERROR!
F70D TRY.MSB   LDY PRG.BEG+1 SEE IF IT IS 8
F70F           CPY #8        Y INSTEAD OF A
     BECAUSE OF MERGE STORE
F711           BNE HOLD.ERR NO, ERROR
F713           STA CHRGET+1 FOR MERGE LATER
F716           STY CHRGET+2 CHRGET TO GET A
     T $801
F719 HOLD      LDA PRG.END   MAKE START OF P
     ROGRAM
F71B           STA PRG.BEG   EQUAL TO CURREN
     T END OF PROGRAM
F71D           SEC
F71E           SBC #1        FIND LENGTH OF
     PROG
F720           STA LEN
F722           LDA PRG.END+1
F724           STA PRG.BEG+1
F726           SBC #8        FINDING LENGTH
F728           STA LEN+1
F72A           CLC
F72B           JMP EXIT.HOLD AND DO A NEW

*--------------------------------
* TRY FOR MERGE
*--------------------------------
F72E M.CMP     CMP #'M
F730           BNE HOLD.ERR NOT M EITHER, E
     RROR!
*--------------------------------
* DO THE MERGE
*--------------------------------
F732           LDA PRG.BEG   MAKE SURE
F734           CMP #1        A PROGRAM IS
F736           BNE DO.MERGE ON HOLD
F738           LDA PRG.BEG+1
F73A           CMP #8
F73C           BEQ HOLD.ERR NOPE!
F73E DO.MERGE  LDA PRG.END   SQUASH VARIABLE
F740           STA VARTAB    TABLE
F742           LDA PRG.END+1
F744           STA VARTAB+1
```

Continued on page 22

* See No. 15, page 12 - author's update

Adding New Commands To DOS 3.3

By Gary Peterson

CORE

One of the features that I liked about ProDOS, when I first saw it, was its ability to BLOAD and BSAVE any type of file to or from memory by specifying a T (for file type) parameter. With this ability you can, for example, put a text file into memory and manipulate it however you wish without having to use the extremely slow READ and WRITE commands. With ProDOS, the Byte (B) and Length (L) parameters can also be used in conjunction with BLOAD and BSAVE so that any range of bytes can be read from or written to any position in the file.

What I did not like about ProDOS, after using it for awhile, were its large memory requirements (so long, language card!) and its incompatibility with all of the DOS 3.3 programs I already owned. ProDOS might be fine for a hard disk based system, but it seems to be just a bit overblown for those of us with computers on low-megabyte diets.

A ProDOS Bug

After trying to use the BSAVE command with the Type and Byte parameters, I discovered that ProDOS had a bug in it which would crop up under certain conditions. Because of this bug, the BSAVE command would cease to operate properly after about 3 succesive BSAVEs where the B parameter was specified (for an example of this bug and a patch for it, see page 20). However, Apple has corrected this bug in their latest release of ProDOS.

Aside from ProDOS, some of the DOS 3.3 enhancers (David-DOS, for example) have commands that let you load and save text files to and from memory. But what I really wanted was the ability to do this with any type of file in conjunction with Address, Length and Byte parameters. I decided to go ahead and try to implement these commands myself. Of course, a little research was first required.

The first place I looked for help was in CALL A.P.P.L.E.'s book, "All About DOS". There I found the code for a command called TYPE which will dump the contents of any type of file to the current output device. This command, although it is handy for looking at the contents of text files, did not have the capabilities for which I was searching. However, I did make a reference of address $A2A8, labeled OPEN, which was commented as being a DOS suboutine which would open any file regardless of type. I also made note of how the author, Brian Matthews, had coerced DOS into accepting the TYPE command and its parameters.

Another article I found of interest in "All About DOS" was Text File Fast Loader by Robert Purves. In his article, Mr. Purves described how he implemented a DOS command called LTXT which allows you to read text files into memory. Except for the fact that it would only read text files, LTXT had the capabilities I wanted. An examination of the LTXT code was quite enlightening and I particularly made note of how the code for BLOAD was utilized to speed up the loading of the files into memory.

After reading these two articles and studying Beneath Apple DOS and Sandy Mossberg's Disassembly Lines columns in Nibble, I had a good idea of how to implement the new DOS commands. All I had to do was to write the code needed to do the job.

I expected to have a lot of problems getting the new commands to work properly, but the job did not turn out to be as difficult as I had anticipated. The final result was that I had two new DOS commands, called MREAD and MWRT, which did just what I had desired. The source code for these commands can be found in Listing 1 on page 19.

MREAD

Here are the basic steps which the code for MREAD goes through when reading a file:,

1) Temporarily stores a File Manager opcode of $03 which indicates that a file is to be read.
2) Checks that Address and Length parameters were specified with the MREAD command. If the parameters were absent, a "SYNTAX ERROR" message is generated.
3) Does a call to $A2A8 to open the desired file.
4) Checks to see if a Byte parameter was specified with the MREAD command. If it is present, $A53B is called to position the "pointer" to the correct position in the file.
5) Retrieves the File Manager opcode and stores it in the File Manager parameter list at $B5BB.
6) Stores an $02 at $B5BC (File Manager Subcode) to indicate that a range of bytes is to be read.
7) Stores the length value from the command line into the proper locations ($B5C1-$B5C2) of the File Manager parameter list.
8) Enters the BLOAD command handler at $A385 to load the file into memory.

MWRT

The operation of the MWRT code is pretty much the same as the MREAD code except that the File Manager is passed an opcode of $04 for reading and the BSAVE command code is utilized instead of the BLOAD code. The MWRT code is a bit longer than the MREAD code because, when writing to a file, the length parameter in the File Manager parameter list must be one less than the actual number of bytes to be written. This is taken care of at $AEA0-$AEAD.

Fitting In The Code

Since the combined code for MREAD/MSAVE is just a bit too bit long to fit into any of the areas of memory within DOS 3.3 that are "free", I put the code at $AE8E where the code for INIT normally lives. If you want, you can reassemble the code so that it will exist within two of the "free space" areas in DOS, $B6B3-$B6FD and $BA69-$BA95, for example.

Changes To DOS

Because of the addition of the two new DOS commands, there are some changes that must to be made to DOS so that it will accept the new commands, locate the code that handles them and know what parameters (A, L, S, D, etc.) can be included with the command. There are 3 places these changes must be made:

1) The command handler entry point table at $9D1E-$9D55. This table contains the entry point of the code which handles each of the DOS commands. The addresses stored here are actually one less than the true entry points (see page 8-4 of Beneath Apple DOS).

2) The DOS command name text table at $A884-$A908. This table contains the ASCII code for each of the valid DOS commands. The code for the last character of each command must have its high bit set to 1 (see page 8-18 of Beneath Apple DOS).

3) The Command valid keywords table at $A909-$A940. This table contains a two byte entry for each of the DOS commands to indicate what keywords or parameters are legal for that command. Each of the sixteen bits within these 2 bytes has a certain meaning (see page 8-18 of Beneath Apple DOS).

To fit in the two new DOS commands, I had to remove two of the existing commands. INIT was an obvious choice to eliminate since its code is written over, anyway. The seldom used (for me, at least) CHAIN was the second command to go. All that is necessary is to replace the table entries for these two commands with what is needed for MREAD and MWRT. These changes are:

9D1E:9A AE - Address-1 of MWRT code.
9D26:8D AE - Address-1 of MREAD code.
A884:4D 57 52 D4 - Text for MWRT.
A893:4D 52 45 41 C4 - Text for MREAD
A909:20 7B - Valid keywords for MWRT.
A911:20 7B - Valid keywords for MREAD.

The Applesoft program in Listing 2 will BLOAD the MREAD and MWRT code and make the necessary modifications in DOS for the commands to work properly.

Using MREAD & MWRT

The MWRT works pretty much like the normal BSAVE command, with the address (A) and length (L) parameters being required. However, MWRT is not allowed to create a new file. If you try to MWRT a file that is not already on the disk, a "FILE NOT FOUND" message will be printed. The usual slot, drive and volume parameters can be specied, as can a byte (B) parameter. The use of the byte (B) parameter will let you write to anywhere in the file, but if it is not used, writing will start at the first byte of the file. Remember that the first byte of a file is considered to be byte $0. For example the command:

MWRT TEST,A$2000,L$5,B$3

will write 5 bytes (starting at the fourth byte) into the file called TEST, from memory at $2000-$2004. Exercise caution when MWRTing to binary files since the file's address and length information is stored in the first four bytes of the file. MWRT *does not* update these bytes of binary files.

The MREAD command is utilized in essentially the same way as MRT, except that data is read from the file instead of being written into it. If you wish to read an entire file into memory, but don't know its exact length, just use a large length value such as $7FFF. The loading will stop after the final sector of data has been read into memory.

Installing MREAD & MWRT

Before you can use MREAD and MWRT you will have to type in the hexdump listed to the right. Save this code to disk by typing

BSAVE MREAD/MWRT,A$AE8E,L$5F 6C

Then type in the Applesoft program in Listing 2 and save it by typing

SAVE INSTALL MREAD/MWRT

As I mentioned previously, this program will install the MREAD/MWRT code and make the necessary modifications to DOS so that the commands will work properly. Just type

RUN INSTALL MREAD/MWRT

and you have 2 new DOS commands at your disposal. Don't forget that you cannot INIT a disk or use the CHAIN command until you reboot with a normal DOS disk. It would be a wise idea to test the commands on a disposable disk until you are sure that you have the commands operating properly.

I should mention that MREAD and MWRT may or may not work with a modified or enhanced DOS. I successfully tested the commands with Diversi-DOS and also on an Apple with a Corvus hard disk system. This would not be the case with Hyper-DOS and David-DOS, however, because these two DOS enhancements packages also have replaced INIT with their own commands.

Even if you can't think of a use for the MREAD and MWRT commands as I have implemented them, why not try to add some DOS commands of your own. After all, what can you lose besides all of your data?

Bibliography:

Don Worth & Peter Lechner, **Beneath Apple DOS**, Quality Software, 1981.

Sandy Mossberg, Disassembly Lines, **Nibble** (June 1984), pgs. 121-130.

All About DOS, Call A.P.P.L.E., 1983.

Listing 1

```
*
*-------------------------------
*
* CODE FOR MREAD/MWRT COMMANDS.
*
* THE 2 NEW DOS COMMANDS REPLACE
* THE INIT AND CHAIN COMMANDS.
*
*-------------------------------
*
*
            .OR $AE8E
            .TF MREAD/MWRT
*
*
*-------------------------------
*
A000 SYNERR   .EQ $A000     PRINT ERROR.
A2A8 OPEN     .EQ $A2A8     OPEN ANY FILE
A354 BSAVE    .EQ $A354     ENTRY TO BSAVE.
A385 BLOAD    .EQ $A385     ENTRY TO BLOAD.
A53B POSN     .EQ $A53B     POSITION FILE.
AA65 KEYFLGS  .EQ $AA65     KEYWORDS FOUND.
B5B8 FMOP     .EQ $B5B8     FM OPCODE.
B5BC FMSUB    .EQ $B5BC     FM SUBCODE.
B5C1 FMLEN    .EQ $B5C1     FM LENGTH PARM.
AA6C LEN      .EQ $AA6C     PARSED LENGTH.
*
*-------------------------------
*
* MREAD-THIS DOS COMMAND WILL
* LOAD ANY FILE TYPE INTO MEMORY.
* A & L PARMS ARE REQUIRED.
* S,D,V AND B PARMS ARE OPTIONAL.
*
*-------------------------------
*
AE8E MREAD    LDA #$03      FM READ CODE.
AE90          STA OPCODE    TEMP STORAGE.
AE93          JSR COMCODE   COMMON CODE.
AE96          BCS ERR       ERROR FOUND.
AE98          JMP BLOAD     BLOAD THE FILE.
*
*-------------------------------
*
* MWRT - THIS COMMAND WILL ALLOW
* WRITING TO ANY TYPE OF FILE FROM
* MEMORY. A & L PARMS ARE REQUIRED
* S,V,D AND B PARMS ARE OPTIONAL.
* NEW FILE CREATION NOT ALLOWED.
*
*-------------------------------
*
AE9B MWRT     LDA #$04      FM WRITE CODE.
AE9D          STA OPCODE    TEMP STORAGE.
AEA0          SEC           ONE MUST BE
AEA1          LDA LEN       SUBTRACTED
AEA4          SBC #$01      FROM THE

AEA6          CMP #$FF      LENGTH WHEN
AEA8          BNE .1        WRITING A
AEAA          DEC LEN+1     RANGE OF
AEAD .1       STA LEN       BYTES.
AEB0          JSR COMCODE   COMMON CODE.
AEB3          BCS ERR       ERROR FOUND.
AEB5          JMP BSAVE     WRITE THE FILE.
*
*-------------------------------
*
* COMMON CODE USED BY MREAD AND MWRT
* COMMANDS. CHECKS FOR A & L PARAMETERS,
* OPENS THE FILE AND POSITIONS IF
* NECESSARY.
*
*-------------------------------
*
AEB8 COMCODE  LDA #$09      ADDRESS AND
AEBA          AND KEYFLGS   LENGTH PARMS
AEBD          CMP #$09      SPECIFIED?
AEBF          BEQ .1        AN ERROR IF
AEC1          SEC           ABSENT.
AEC2          RTS           RTS WITH ERR.
AEC3 .1       JSR OPEN      OPEN ANY TYPE.
AEC6          LDA KEYFLGS   LOOK FOR BYTE
AEC9          AND #$02      PARAMETER.
AECB          BEQ RWFILE    B NOT FOUND.
AECD          JSR POSN      POSITION.
AED0 RWFILE   LDA OPCODE    TEMP STORAGE.
AED3          STA FMOP      FM OPCODE.
AED6          LDA #$02      R/W A RANGE.
AED8          STA FMSUB     FM SUBCODE.
AEDB          LDA LEN       PUT THE FILE
AEDE          STA FMLEN     LENGTH INTO
AEE1          LDA LEN+1     THE FM
AEE4          STA FMLEN+1   PARM LIST.
AEE7          CLC           NO ERRORS.
AEE8          RTS           RETURN.
*
*-------------------------------
*
* PRINT SYNTAX ERROR IF ADDRESS
* AND LENGTH PARMS WERE ABSENT.
*
*-------------------------------
*
AEE9 ERR      JMP SYNERR    PRINT ERROR.
*
*-------------------------------
*
* TEMPORARY STORAGE FOR
* THE FILE MANAGER OPCODE.
*
*-------------------------------
*
AEEC OPCODE   .BS 1         TEMP STORAGE.
*
*-------------------------------
*
```

* add patch from No 15, page 12

Hexdump

```
AE8E: A9 03                          $6F9A
AE90: 8D EC AE 20 B8 AE B0 51        $8390
AE98: 4C 85 A3 A9 04 8D EC AE        $E5FC
AEA0: 38 AD 6C AA E9 01 C9 FF        $44C4
AEA8: D0 03 CE 6D AA 8D 6C AA        $7392
AEB0: 20 B8 AE B0 34 4C 54 A3        $07B3
AEB8: A9 09 2D 65 AA C9 09 F0        $85F0
AEC0: 02 38 60 20 A8 A2 AD 65        $7136
AEC8: AA 29 02 F0 03 20 3B A5        $C7AE
AED0: AD EC AE 8D BB B5 A9 02        $DF84
AED8: 8D BC B5 AD 6C AA 8D C1        $53F0
AEE0: B5 AD 6D AA 8D C2 B5 18        $E034
AEE8: 60 4C 00 A0 00                 $CA20
```

* (ditto)

Listing 2

```
10 REM ++++++++++++++++++++++++++
20 REM +  INSTALLS MREAD/MWRT   +
30 REM +   AND PATCHES DOS TO   +
40 REM +    ACCEPT THE MREAD    +
50 REM +   AND MWRT COMMANDS    +
60 REM +    BY GARY PETERSON    +
70 REM +   HARDCORE COMPUTIST   +
80 REM +         NO. 13         +
90 REM ++++++++++++++++++++++++++
100 D$ = CHR$ (13 ) + CHR$ (4 )
```

```
110 PRINT D$ "BLOAD^
    MREAD/MWRT,A$AE8E"
120 POKE 40222 ,154 : POKE 40223 ,174
    : REM ADDRESS -1 OF MWRT
130 POKE 40230 ,141 : POKE 40231 ,174
    : REM ADDRESS -1 OF MREAD
140 FOR AD = 43140 TO 43143 : READ BY :
    POKE AD ,BY : NEXT : REM
    REPLACE INIT WITH MWRT
150 FOR AD = 43155 TO 43159 : READ BY :
    POKE AD ,BY : NEXT : REM
    REPLACE CHAIN WITH MREAD
160 POKE 43273 ,32 : POKE 43274 ,123 :
    REM VALID KEYWORDS FOR MWRT-
    A & L REQUIRED , S ,D
    ,V AND B OPTIONAL
170 POKE 43281 ,32 : POKE 43282 ,123 :
    REM VALID KEYWORDS FOR MREAD
    X A & L REQUIRED. S ,D
    ,V AND B OPTIONAL
180 HOME :A$ = "MREAD^AND^MWRT^NOW^
    INSTALLED" : HTAB 20 - LEN (A$ ) /
    2 : PRINT A$
190 DATA ^77 ,87 ,82 ,212 ,77 ,82 ,69
    ,65 ,196
```

Checksums

```
10   - $BADD     110  - $6C68
20   - $9B13     120  - $CFD2
30   - $4D3B     130  - $286F
40   - $AD92     140  - $7BA1
50   - $C899     150  - $F01C
60   - $FF65     160  - $DFF3
70   - $A3BF     170  - $F900
80   - $A900     180  - $C3A5
90   - $924D     190  - $4BD0
100  - $9D81
```

175 POKE 43773,76: POKE 43774,237: POKE 43775,174: REM APPLY FILE MANAGER PATCH

installed - IT WORKS!

Fixing a ProDOS 1.0.1 BSAVE Bug

by Cecil Fretwell

For those of you who have ProDOS 1.0.1, dated 1 Jan 84 and BASIC.SYSTEM dated 15 Nov 84, are you aware of the fact that the BSAVE command has a bug if you use it with the B (byte) parameter? If you don't believe me, just read on.

The Bug

To demonstrate this bug, try the following test. First, create a new file using the following command

BSAVE TEST,A$1000,L256

The CATALOG command will correctly show the length of TEST to be 256 with a starting address of $1000. Now type

BSAVE TEST,A$1000,L256,B$100

The CATALOG will now indicate that TEST has a length of 512 and a starting address of $1000. So far, so good. Now, type

BSAVE TEST,A$1000,L256,B$200

A CATALOG will show that TEST has a length of 512 and a starting address of $1000. If the ProDOS documentation is correct, the length of the file after the third BSAVE should have been 768.

Perhaps you think I used the parameters incorrectly. Should I have used an address of $1100 in the second BSAVE and an address of $1200 in the third BSAVE? You can give that a try if you like, but you will find the result to be the same. No matter what B, A or L parameters are specified, the third BSAVE will overwrite the effort of the second BSAVE.

Disclaimers

Now I will present a fix for this bug with the following disclaimers. First, this bug has been corrected in the latest release of ProDOS (1.1). Apple made several changes to the latest release of the BASIC.SYSTEM file, in addition to the correction of the BSAVE bug. Because Apple feels that assembly language programmers should only access ProDOS through the Machine Language Interface (MLI), they have reserved the right to change code from release to release. The result will be that the code for the ProDOS commands will be shifted in memory. Therefore, if you apply my patch for the bug, be forewarned that it will only work on the modules whose dates were given at the beginning of this article. Secondly, although several of us have tested the patch, there is no guarantee that it will work perfectly under all conditions.

The Fix

If you do not want to permanently change your copy of BASIC.SYSTEM, on the ProDOS boot disk you can just write a short program which will apply the patch whenever it is run. This program will change the content of $AF1C from $30 to $40 and the contents of $AF1D from $F0 to $D0. Create this program and save it after booting up ProDOS by typing the following

```
NEW
10 POKE 44828,64 : POKE 44829,208
SAVE FIX.BSAVE.BUG
```

When you want to apply the patch just type

RUN FIX.BSAVE.BUG

Of course, you can also just perform the appropriate POKE's from immediate mode whenever you like.

To permanently apply the patch to a ProDOS System disk, type in the following commands

```
BLOAD BASIC.SYSTEM,TSYS,A$2000
POKE 44828,64:POKE 44829,208
UNLOCK BASIC.SYSTEM
BSAVE BASIC.SYSTEM,TSYS,
A$2000,L$2000
LOCK BASIC.SYSTEM
```

The patch will now be active each time you boot the disk.

Convinced?

To convince youself that the patch works, let's try the original set of commands all over again. Type

```
DELETE TEST
BSAVE TEST,A$1000,L256
BSAVE TEST,A$1000,L256,B$100
BSAVE TEST,A$1000,L256,B$200
CATALOG
```

The CATALOG will now show that TEST has a length of 768, just as it should. You can now use the B parameter to "append" data to whatever file you want.

The above example is really not something you would normally want to do since the data at $1000-$10FF was not changed between the BSAVEs. Let's try something a little more applicable.

Suppose you want the data in $1000-$1FFF, $2000-$20FF and $3000-$30FF stored, in that order, into a single file. The following commands will perform this task

```
BSAVE DATA,A$1000,L256
BSAVE DATA,A$2000,L256,B$100
BSAVE DATA,A$3000,L256,B$200
```

A CATALOG of the disk will show DATA to have a length of 768 with a starting address of $3000. Take note of the starting address; it is the address from which the final BSAVE was performed. If you do not want to have the data BLOADed at $3000 you will have to specify another address when you BLOAD DATA. For example, by typing

BLOAD DATA,A$1000

If you wish, you can also reset the load address to $1000 by typing

```
BLOAD DATA,A$1000
BSAVE DATA,A$1000,L768
```

I hope that my fix for the ProDOS BSAVE bug will be of help to those users who have not yet obtained the latest release of ProDOS.

CORE

Enhancing Your Apple][

Volume 1, Second Edition by Don Lancaster

Reviewed By Martin Collamore

Don Lancaster, one of the pioneers of the microcomputer industry and author of such books as the TTL, CMOS and Cheap Video Cookbooks, in the last few years has become one of most active champions of the Apple][user. Besides being an author and all-around guerrilla hardware guru, Don is the founder of a Thatcher, Arizona based company called Synergetics which sells items such as an absolute RESET kit for the Apple //e and a toolkit for users of Applewriter //e.

The second edition of Enchancing Your Apple, Volume 1, is the first of a planned series of books by Mr. Lancaster designed to help serious users of Apple][computers realize the full potential of their machines. The first edition of the book was released back in 1982, and the recently published second edition has been updated to include information on the Apple //e and Franklin Ace computers. The book lists at $15.95 and provides four hardware and four software enhancements which deal mainly with hi-res graphics. A disk containing all the programs listed in the book and a package of the necessary hardware is also available by filling in the order cards provided at the back of the book.

In the introduction of the book, Don very clearly states his philosophy when it comes to the Apple Computer, its use and the personal computer industry in general. Here are some excerpts taken from the book's Introduction:

"The Apple][is far more significant and it will have a vastly greater impact than such short term frivolities as the automobile and television-and, possibly, even more than the printed word itself."

"The garbage-to-good ratio of Apple software is skyrocketing. The quantity of truly astoundingly atrocious Apple software is now running at least a thousand times ahead of the useful and reasonable stuff. And it's getting worse."

"Garbage software is usually locked, so that the user cannot back up or modify the program to suit his own needs. It is usually slow and awkward to boot."

"The big thing about copy protection is that is doesn't. A year's effort by a crackerjack military cryptography team can usually be undone in fifteen minutes, between klingon zappings, by your average fourteen-year-old. And morality and economics aside, one fact stands out....undoing copy protection is fun!

Not only is it fun, but cracking the uncopyable is about the most challenging and most rewarding thing that you can possibly do with your Apple. And, the things you learn along the way are exactly the skills that you will need to become a really great programmer. So, I guess we should all be thankful for the copy-protection fanatics since they are giving us all this fascinating entertainment and superb training at an unbeatable price."

"...it is absolutely impossible to write a great program in BASIC. Pascal, of course, is so bad that it is beyond the pale. Great programs **must** *execute either wholly or in part in machine language so that they can use Apple's resource to the utmost, at the fastest possible speed."*

Agree with Don or not, no one is likely to accuse him of being mealy-mouthed when it comes to the Apple.

The Enhancements

The first enchancement is aimed at those who use the family color TV as a monitor. Instructions are provided for the construction of what Don calls a "glomper". Not a type of cookie monster, a "glomper" simply provides a means of quickly connecting your computer to the TV, eliminating the aluminum switchbox that came with the modulator (that thing that was supposed to stick to the back of your television, but only stayed in place for about 10 minutes). According to Don, " This changeover switch is totally useless. It doesn't even do what it is intended to do, since you can easily leave a built-in antenna in place and radiate your video all over everywhere." Anyway, the use of Don's "glomper" will keep your downstairs neighbors from banging on the ceiling every time you turn on your computer and you don't even have to open up your computer to install it.

The remainder of the hardware mods do require you to open your Apple and heat up your soldering iron. The mods are simple and, if done correctly, removable if warranty work is needed.

The second enhancement is a programmable color killer. What it does is to allow true black/white/gray in HIRES and mixed text and graphics screens without all that annoying color fringing. It is programmable and is turned off by a cold boot or RESET. A POKE from Basic or BIT from assembly language turns the circuit on or off.

Some warnings: It won't work with Rev. 0 Apples and you must have a color monitor or reasonable quality TV. Since Rev. 0 didn't have a color killer circuit in the first place, and this mod uses the existing color killer circuitry in newer Apples (it works only in the text mode as is), this mod won't work for the owners of ancient Apples. The mod should work with any moderate quality TV after some adjusting of color levels and a tweek of the color trim on the Apple motherboard. The mod may not work on what Don calls "very old, cheap or scungy" TV sets due to the manner in which they detect a color signal. Because the color killer modification utilizes AN1 on the game paddle port, there may be conflicts for owners of some peripherals, such as light pens. You'll have to read the text to see if this applies to you.

The field sync enhancement described in Chapter 4 provides the basis for for what I think is the slickest of the hardware enhancements. This enhancement allows you to lock your software to the video timing so that such things as the flipping of soft switches or display pages can be done *during* the return trip of the video raster scan from the bottom of the screen to the top. The mod

is so simple that it has been added to the Apple //e's circuitry. Who knows where Apple graphics would be today if this mod had been standard from the beginning.

Here are just some of Lancaster's suggestions for its use: *"mix and match display modes, both dynamically and 'on the fly' for splits or wipes in any direction, eliminate 90% of the parts and hassles needed for a fast and precision light pen or touch screen, smooth, glitch-free animation or gentle scrolling. Or 3-D graphics, text over color, hundreds of LORES colors. How about video wipes moving smoothly off the page to reveal a second hidden page, done in any direction, speed, or combination."*

An excellent explanation of the Apple CPU and video timing is presented as background to the field sync mod. Several short subroutines and demo programs are included on the disk and in the book. Those without the disk may have to relocate some programs, but it is not much of a problem. This modification does utilize the cassette port circuitry, but a switch can be added if you still occasionally use your cassette port for other I/O purposes.

The power of the field sync modification is demonstrated in Chapter 5 entitled, "Fun With Mixed Fields". Here, Don provides some software that allows you to mix Text, Lo-Res and Hi-Res in any display. Two well-documented programs are provided in this chapter to demonstate the potential of "mixed fields". Apple //e owners can use the programs without having to pay homage to the god of hardware since the field sync modification is already built into their machines.

On Rev. 1 and newer Apples]['s there can be a glitch flipping in and out of LORES when using the field sync mod. In Chapter 6, Lancaster offers a fix for this glitch which requires modification of two chips on the Apple's motherboard. Again, for //e owners, this modification is not required.

The enhancements for Chapters 8 & 9 involve software only. Chapter 7's Gentle Scroll can be interfaced to Apple's Hi-Res Character Generator (or any other character generator) so that the text will scroll one, instead of eight, pixels at a time. If you have ever seen the standard HRCG scroll you will really appreciate this enhancement. The fast backgrounder utility in Chapter 8 provides a means of quickly clearing a hi-res page to your choice of 32 different colors or a practically infinite number of patterns. A complete discussion of the inner workings of the Apple's hi-res display is also included in Chapter 8.

The Tearing Method

One other area that is covered is more of a technique than an "enchancement". This is what Don calls the "Machine Language Tearing Method" and is detailed in Chapter 3.

Step by step, Lancaster shows you how to break down someone else's machine language program into understandable subunits. The High Resolution Character Generator program on Apple's DOS Toolkit is used as an example, although the method will work just as well on any machine language program. After working the example, you're ready to try exploring for those extra ships or learning how to modify the printer driver in your word processor.

Although much faster and saner than some orthodox methods, one stated requirement is "The Right Attitude" so that you can "Grok The Program". This is especially true if this is your first attack in this field of battle. By working through the example you'll have picked up considerable assembly code experience, become familar with the Apple's memory structure, and even gotten a good idea of how a machine language program is put together.

Some of the items you'll need to practice the tearing method are 48K with on board old monitor ROM (preferred, but not essential), printer, and 6502 and Apple references. Also, sundry stationary things like tape, scratch pads, and all the different color highlighters with matching felt-tip pens you can get.

I won't get into the nuts and bolts of the technique, but should you take the plunge and maintain your sense of proportion and perspective, you'll be amply rewarded for your time. Needless to say these techniques might be used to study protection schemes.

Conclusions

Don Lancaster has provided plenty of grist for the graphics-oriented mill. HIRES hackers should run, not walk, to get a copy of "Enhancing Your Apple][" Vol. 1. Since Apple has provided the field sync mod on the //e, you can now program for an audience wider than your own customized machine.

If you are considering ripping into someone else's machine code, Lancaster's clear instructions on how to do this are excellent. Like cod liver oil, it is sometimes difficult to take, but it does you some good. His techniques are a world above brute force methods. Joe "shoot'em-up-Zaxxon" Jones might find these things interesting, but the enhancements aren't really directed toward him.

If you buy the book, consider buying the hardware package unless you have access to a well-stocked electronics store that carries machined-pin DIP sockets. Don't cut corners! Follow instructions! The insulation you smell may be your own!

Volume 2 of Enhancing Your Apple is apparently very close to publication. The promised enhancements include an absolute RESET modification for the Apple //e, a graphics screen dump program for daisy wheel printers and a $2 BSR ultrasonic interface. Personally, I can't wait.

CSAVER source code

Continued from page 17

```
F746           LDA #DO.1.LIN POINT COUT TO
     DO.1.LIN
F748           STA COUT.VEC SO THAT WHEN
F74A           LDA /DO.1.LIN FINISHED,
F74C           STA COUT.VEC+1 DO NEXT ONE

*--------------------------------
* DO ONE LINE
*--------------------------------
F74E DO.1.LIN  PLA            POP OFF JSR
F74F           PLA
F750           JSR CHRGET     SKIP LSB LINK
F753           JSR CHRGET     GET MSB
F756           TAX
F757           BEQ DONE.MERGE WHEN LINK =0,
      DONE
F759           JSR CHRGET     GET LINNUMBER
F75C           STA LINNUM
F75E           JSR CHRGET
F761           STA LINNUM+1
F763           LDY #0         FILL INPUT BUFF
     ER
F765 .2        JSR CHRGET
F768           STA BUFF,Y
F76B           INY
F76C           TAX            END OF LINE?
F76D           BNE .2         NOPE, MOVE NEXT
      BYTE
F76F           INY            Y MUST EQUAL EO
     L+5
F770           INY            FOR THE ENTER L
     INE
F771           INY            ROUTINE
F772           INY
F773           JMP ENTER.LINE PUT THIS LINE
      IN THE PROGRAM
F776 CHRGET    LDA $FFFF      DUMMY NUMBER
F779           INC CHRGET+1
F77C           BNE .1
F77E           INC CHRGET+2
F781 .1        RTS

*--------------------------------
* FINISH MERGE
*--------------------------------
     DONE.MERGE
F782           LDA PRG.BEG    MOVE PROGRAM
F784           STA A1
F786           LDA PRG.BEG+1 BACK TO $801
F788           STA A1+1
F78A           LDA #1
F78C           STA PRG.BEG
F78E           STA A4
F790           LDA #8
F792           STA A4+1
F794           STA PRG.BEG+1
F796           LDA PRG.END
F798           STA A2
F79A           LDA PRG.END+1
F79C           STA A2+1
F79E           JSR MOVE       MOVE IT DOWN!
F7A1           JSR SET.VID    PR#0
F7A4           JSR $3EA       RECONNECT DOS
F7A7           SEC            MOVE PROGRAM EN
     D DOWN
F7A8           LDA PRG.END
F7AA           SBC LEN
F7AC           STA VARTAB
F7AE           LDA PRG.END+1
F7B0           SBC LEN+1
F7B2           STA VARTAB+1
F7B4           JMP EXIT.MERGE EXIT VIA FIX.
     LINKS
     END.CSAVE
```

Product: Locksmith 5.0 Revision Level F
Publisher: Alpha Logic Business Systems Inc.
Language: Machine and Locksmith Processing Language
Hardware: APPLE][+, //e, with 48K
At least one disk drive
Cost: $99.95
UPDATE: $29
PARMS DISK: $8
NEWSLETTER: $12

Locksmith 5.0

And The Locksmith Programming Language

By Thomas H. Dragon

When the bit copy program Locksmith first became available from Omega in 1981, it could not be purchased in most computer stores. It was a revolutionary program that only hackers dared dream of and most stores were afraid to carry. I purchased my Locksmith, one of the first 600, directly from Omega. Of course, as commercial companies learned about Locksmith, their protection procedures became more and more sophisticated. Omega then began a series of Locksmith updates to accommodate the new protection procedures. Each update of Locksmith was more powerful than the previous update. By the time Locksmith 4.0-4.1 became available, it was necessary to make parameter changes for virtually every disk on the market. But it is only possible to update a fundamental algorithm so many times before it becomes necessary to change the algorithm altogether.

Locksmith 5.0 represents a long awaited change in the fundamental Locksmith algorithm. Like the first Locksmith, this new version is also revolutionary, both in method of operation and in philosophy of user support.

Omega Microware: 1981-1984 R.I.P

Omega Microware Inc. the original publisher of Locksmith and the Locksmith family, Inspector and Watson, filed for bankruptcy in June 1984. The Locksmith family is now supported by Alpha Logic Business Systems Inc. of Woodstock, IL. Rumor has it that Omega went bankrupt with debts totaling one-quarter of a million dollars. An interesting sideline to this story is that for some period of time prior to their demise, Omega entered into the disk protection business. If this cannot be considered a conflict of interest, I do not know what can be. Perhaps this could help explain why Omega's support for Locksmith became so dismally poor.

Alpha Logic, the new support company for Locksmith, is not a new company. They have been in the distribution business for several years, dealing especially with Saturn products. They intend to provide full support for the Locksmith family of products and have hired the Locksmith development team. They are providing full research and development support for Locksmith and related Locksmith products, such as Locksmith for the //e and a "Locksmith" type algorithm for the Macintosh and the IBM-PC. They are supporting a quarterly newsletter that provides both in-depth and simple information about Locksmith and new ways of using it. This newsletter is available for $12 to registered Locksmith owners. Furthermore, Alpha Logic is providing exceptional telephone support and has already implemented some innovative Locksmith support techniques.

Locksmith Programming Language (LPL)

The new concept associated with Locksmith 5.0 is the Locksmith Programming Language, LPL. At first glance LPL is somewhat overwhelming! It is a label language similar in style to LOGO. The 140 page user's manual, in conjunction with the first Locksmith Newsletter, provides a great deal of insight into the role and function of LPL. I have listed two LPL "programs" in Table 1. Each line represents a logical operation. Each language label has an algorithm associated with it. For example, algorithm #7B is referred to as READ in the label language. The Locksmith manual provides a reasonable description of these labels. For the label READ the following description is given:

"This algorithm reads a track. If it encounters an error, it checks to make sure that the number of times the track has been read is less than the value in REREAD. If so, it activates ACTREAD, clears all error flags and rereads the track. If the value is equal to or greater than REREAD, it exits with the appropriate error flag set."

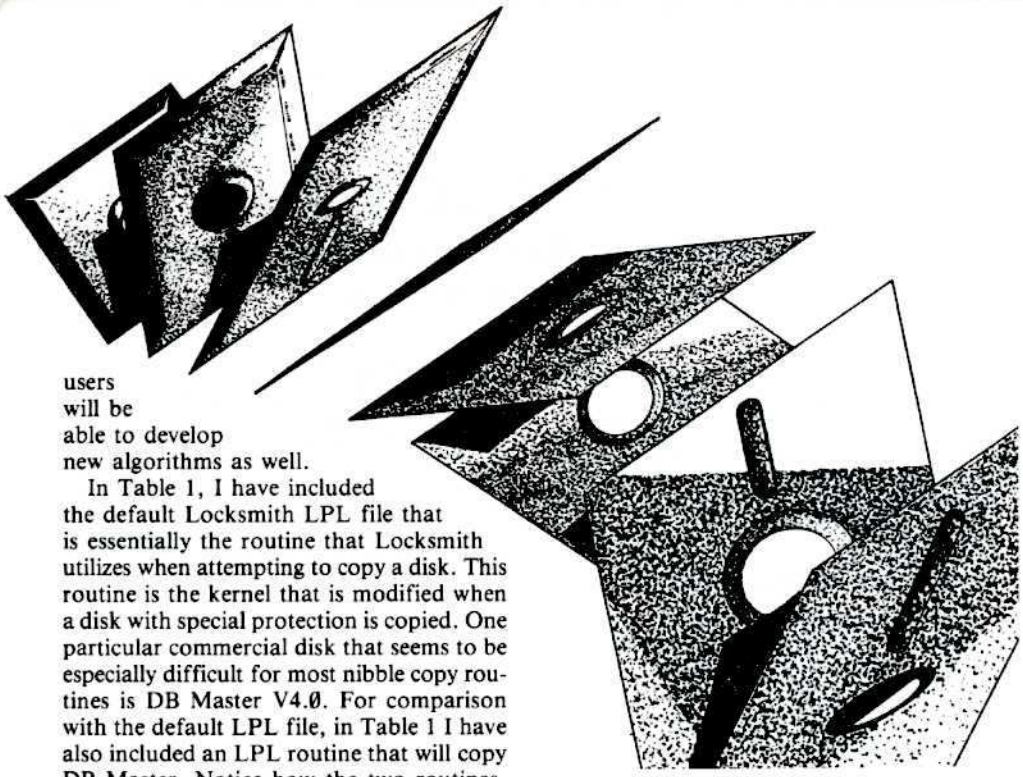
The Locksmith authors feel that LPL is much more flexible than the old numerical parameter approach, as words are more meaningful and easier to work with than numbers. They feel that they will be able to develop new algorithms as the need arises. Furthermore, they hope that some of the

Table 1

Two Examples Of Locksmith Programming Language Files

```
*
*Default LPL File
*
READ
CHANGE SS DHDR
TSTART DOS PAT1 STAT1
IF FAIL 1 THEN TSTART LONG SS
TEND REPEAT
DISPLAY
TSTART BACKSPACE
TEND FSPACE 3
VSTART NORM
LABEL 1 : WRITE STAT 1
IF SUCC 1 THEN GOTO EE
SHORTEN ALL EQUAL BY 2 STAT 5
IF FAIL 5 THEN GOTO DD
CLEAR ERROR : GOTO 1
LABEL DD
SHORTEN ALL CENTER BY 2 STAT 6
IF FAIL 6 GOTO DA
CLEAR ERROR : GOTO 1
LABEL DA : *SHORTENING FAILED
LABEL EE : *WRITE SUCCEEDED
COPY 0 22 1
```

```
*
*DB Master V4.0 LPL File
*
READ
CHANGE SS DHDR
TSTART DOS PAT1 STAT1
IF FAIL 1 THEN TSTART LONG SS
TEND REPEAT
DISPLAY
TSTART BACKSPACE
TEND FSPACE 3
VSTAT NORM
LABEL 1 : WRITE STAT 1
IF SUCC 1 THEN GOTO EE
SHORTEN ALL EQUAL BY 2 STAT 5
IF FAIL 5 THEN GOTO DD
CLEAR ERROR : GOTO 1
LABEL DD
SHORTEN ALL CENTER BY 2 STAT 6
IF FAIL 6 GOTO DA
CLEAR ERROR : GOTO 1
LABEL DA : *SHORTENING FAILED
LABEL EE : *WRITE SUCCEEDED
COPY 0 5 1 SYNC=YES
COPY 6.5 22.5 1 SYNC=YES
*WRITE PROTECT COPY BEFORE RUNNING
*
*IF ABOVE DOESN'T WORK CHANGE COPY
*STATEMENTS TO FOLLOWING FOR SPIRAL
*TRACKING
*
*COPY 0 0 1 SYNC=YES
*COPY 1 6 1
*COPY 6.5 11.5 1
*COPY 12.25 13.25 1 SYNC=YES
*COPY 14.5 22.5 1
```



users will be able to develop new algorithms as well.

In Table 1, I have included the default Locksmith LPL file that is essentially the routine that Locksmith utilizes when attempting to copy a disk. This routine is the kernel that is modified when a disk with special protection is copied. One particular commercial disk that seems to be especially difficult for most nibble copy routines is DB Master V4.Ø. For comparison with the default LPL file, in Table 1 I have also included an LPL routine that will copy DB Master. Notice how the two routines, Default and DB Master, are virtually identical except for the last lines, the COPY statements.

Utilizing An LPL Routine To Copy A Disk

There are at least three ways to copy DB Master with Locksmith 5.Ø. From the boot-up Locksmith menu the Text Editor may be entered by pressing T. Once in the Text Editor you may enter the LPL routine for DB Master to form an LPL file. This is accomplished after pressing E (enter editor) while in the Text Editor. Once entered, the LPL routine may be saved as an LPL file by pressing S. The file may be saved on either the Locksmith disk or on some other DOS 3.3 disk. Once the LPL routine has been entered, simply press B (backup/copy disk) and follow the screen instructions to obtain a backup of DB Master.

A second, much easier, method for backing up DB Master involves the use of a Parm Disk that comes out quarterly with the Locksmith Newsletter. The Parm Disk has an extensive collection of LPL files arranged in alphabetical order. The information in Table 1 came from the Parm Disk. To use the Parm disk, enter the Text Editor. Once in the Text Editor, press the letter L (load LPL file). When prompted for the parm file name, enter PARMS D for DB Master inasmuch as there is one parm file for each letter of the alphabet and the first letter of the program identifies the particular parm file to be used. The user will be prompted again to enter the actual name of the program, DB MASTER V4.Ø for this example. Locksmith then searches for the PARM D file and searches within the PARM D for the DB MASTER V4.Ø LPL file. Once the file is loaded (approximately six seconds), press the letter B (backup/copy) and follow screen prompts to make the backup.

The third procedure is similar to the old parm's procedure followed with the Locksmith 4.Ø series whereby numerical parameters are entered. To enter parameters, the letter P (parameter) must be pressed from the boot-up menu. Most of the old parms appear to work with Locksmith 5.Ø but there are no numerical parms available, at present, for newer commercial programs, only LPL files. However, the Locksmith authors are contemplating making available the parm equivalents of LPL files.

Interestingly, many of the LPL files are very basic modifications of the default LPL file provided in Table 1. The file for DB Master is no exception. It is simply the default LPL file with additional lines appended in place of the COPY Ø 22 1. If you have used earlier versions of Locksmith, it is clear from the appended code that DB Master uses track synchronization, that tracks Ø to 5 are copied using increments of 1 and then half tracks are used in increments of 1 from 6.5 to 22.5. Note that a second set of COPY statements is included; the asterisks denote comment-type labels. Some of the newer versions of DB Master use a spiral tracking procedure for protection. If the first LPL file does not provide a faithful copy and your DB Master is protected with spiral tracking, changing the COPY statements as noted at the bottom of Table 1 should provide a faithful copy. Be sure to remove the asterisks from the front of the copy statements.

LPL Files In General

It should be clear that loading an LPL file from disk is a very straightforward and relatively error free method for customizing Locksmith to backup a specific disk. It should also be apparent that the LPL language makes Locksmith much more powerful and generally useful than any other nibble copier. The first Parm Disk (discussed in the first Locksmith Newsletter) is available from Alpha Logic for $8 and is a real bargain inasmuch as it contains LPL files for approximately 2ØØ commercial disks. I compared the Hardcore Most Wanted List (Issue No.1Ø) with the first Parms Disk and found LPL files for the following commercial disks: APPLE Business Graphics, Flight Simulator II, Type Attack, DB Master V4.Ø, PFS Graph, and Facemaker.

It would appear that there will be two types of users for Locksmith 5.Ø: the user who not only backs up disks but also develops new LPL files, and the user who is simply interested in backing up disks and has neither interest nor skill in developing new LPL files. Alpha Logic has indicated that they will purchase and publish in their newsletter the new LPL files from those who make them. This is the Locksmith parm-developer incentive plan. This new symbiotic support relationship should work very well for the user community.

New Locksmith Features

Locksmith 5.Ø is on a DOS 3.3 disk which means that it will boot on any APPLE compatible drive, unlike other nibble copiers (EDD) which do not boot on some APPLE drives. The Parms Disk is also on a DOS 3.3 disk. This allows the actual creation of parm files with either the Locksmith Text Editor or any one of a number of word processors. Finally, placing programs and files on DOS 3.3 disks reduces the per-disk reproduction costs.

There are several features built into Locksmith 5.Ø that are not yet available to the general user. Perhaps the most interesting aspect of this new Locksmith is an unprotect feature. For the disk with copy protection that appears to be impossible to backup because of physical alteration of the disk itself, Locksmith has an undocumented feature that can ultimately produce an unprotected copy! I have not actually seen this feature work and methods for making it work have not yet been provided to the general population of users, but the necessary algorithms are already in Locksmith 5.Ø.

DOS 3.3 Utilities

The 16 sector utilities on the new Locksmith are quite exceptional! There are five general utilities: fast (very fast!) backup, fast verify, sector format, sector compare, and sector sync signature. These utilities are intended to work with regular unprotected DOS 3.3 disks. The backup and verify are unbelievably fast and take advantage of any memory expansion card(s) that you might have in your APPLE. With a Saturn 32K card I am able to copy a DOS 3.3 disk in approximately 12 seconds. In my opinion, the integrity of this copy routine is better than that of any of the quick-copy procedures.

That is, you actually know when repeated reads or writes are made for a particular sector and whether or not the repeat was successful. Using the sector compare, two disks may be rapidly compared sector by sector to specifically identify by sector any differences that may exist between the two. The sector format utility allows the user to re-format either a sector, track or whole disk. The sync signature allows you to study the synchronization scheme on a disk as well as determining what copy program created a 16 sector disk! The sync signature is discussed in detail in the user's manual.

The more general utilities found on previous Locksmith versions are still available on Locksmith 5.Ø. These are: erase a disk, certify a disk, and disk speed check. Furthermore, there are several new general utilities: a parameter editor which allows a user to scan and modify all Locksmith parameters; a quickscan that scans a disk to determine to determine which tracks on a protected disk are and are not being used; and a screen print routine working with a single key-stroke. Of course, the Watson and Inspector interface is still supported.

Support And Updates

It is already quite clear that Alpha Logic intends to provide better support than Omega did. However, support will only be provided for registered users. If you are not a registered user you will not receive telephone support and you will not be eligible to receive the Locksmith Newsletter or the Parms Disk. When you place a support call to Alpha Logic you will be asked for your Locksmith serial number, your name and a bit of random information from your registration card, such as zip code or street number. If you cannot provide the necessary information then you will not receive support help. Alpha Logic will not be giving out parameters over the phone, but will try to develop LPL files for those programs for which there is the most demand. These files will be distributed through the newsletter and the parms disk.

Disk updates are easily accomplished through the newsletter or Parms Disk. If the Parms Disk is to be used, enter the Text Editor, press L for load, and respond to the prompt with the word PATCH. An update patch is loaded. Once the patch is loaded press P (patch) in the Text Editor and, if the prompts are properly followed, the Locksmith disk is updated to the current version level. The first parms disk contains the patch to early revisions up to the latest revision, F. Beware if you have a liberated Locksmith disk. It appears that it will be destroyed by the patch update.

When purchasing or updating to Locksmith 5.Ø the customer is provided with an original and a backup. Replacement disks are available for $5 and an original. This policy is a bit better than the original Omega policy which did not provide a backup with the original. Alpha Logic has indicated that it will not provide LPL files for, or any information regarding, the backup of those commercial disks that provide at least two backups or backups for $5 or less.

The more I use my Locksmith 5.Ø the more I like it, especially its 16 sector utilities. I am more than pleased with the ease of use of the Parms Disk. At this time, I would recommend Locksmith 5.Ø over any other nibble copier.

Alpha Logic Business Systems Inc.
4119 North Union Road
Woodstock, IL
Telephone order: 815-568-5166
Customer support: 815-568-6684 (9-5 Central time)
Parm-Developer Incentive Plan: 815-568-6684

WHIZ KID By Ray Darrah

In Hardcore COMPUTIST No.1Ø, I discussed the encoding technique DOS uses to make up for the hardware weakness of not being able to read certain bytes from the diskette reliably. That technique is called "6 and 2" encoding because six bits of the original byte are put one place and the other two are placed in a different byte. Older versions of DOS use different encoding techniques. For example, because DOS 3.2's hardware was inferior to DOS 3.3, even less "valid bytes" were possible. Therefore, "5 and 3" encoding was used. This resulted in a nibblized sector occupying 41Ø bytes instead of the 342 bytes that a nibblized DOS 3.3 sector occupies. Since a sector can be more efficiently nibblized with DOS 3.3, more of them can be stored per track (16 as opposed to 13).

There is an encoding technique used by both versions of DOS called "4 and 4" encoding. In this technique, the even bits of a byte are stored in one byte and the odd bits are stored in the other. The bits from the original bytes (both even and odd) are stored in the even bits of the output bytes. The output bytes are ORed with $AA which has the effect of turning all the odd bits to 1. This makes the output bytes meet the requirements of the disk head. The MSB is a one and no two consecutive zeros will result. To illustrate this, here are some sample input and output bytes:

Original	Nibblized	
00000000	10101010	10101010
11111111	11111111	11111111
10101010	11111111	10101010
01010101	10101010	11111111
11011001	11101110	11111011
ABCDEFGH	1A1C1E1G	1B1D1F1H

Because each original byte yields two nibblized ones, a sector encoded with "4 and 4" encoding would occupy 512 bytes. If a DOS were to encode its sectors with this technique, it could only fit 1Ø or 11 sectors per track. This is why neither DOS uses this technique to encode an entire sector.

What Is It Used For?

In Hardcore COMPUTIST No.8, I mentioned the address marks and data marks on the diskette. I also mentioned that in the address field there are a string of bytes that tell DOS various things about the sector that is about to pass under the read/write head. In fact they are eight bytes that, when decoded in a "4 and 4" manner, produce the disk volume, track number, sector number and checksum for the first three. The checksum byte is made by Exclusive ORing (EOR) the first three bytes together. An Exclusive OR is just like an OR (if a bit of either byte is 1, then the corresponding output bit will be 1) except if both bits are 1, then the corresponding output bit will be Ø. This has the effect of toggling certain bits.

Why Use That Kind Of Encoding?

The reason DOS uses "4 and 4" encoding is because the algorithm to convert nibblized bytes into their original values is extremely simple. Because of this simplicity, DOS can read and convert the bytes at the same time. This makes it possible for DOS to read these bytes, make sure the checksum and track number are correct and decide whether the sector following is the right one all before the data field comes below the head.

If any of these eight bytes aren't what they are supposed to be, then normal DOS will not read the sector that follows them. The Address field is written during INITialization, and never again.

ATTENTION ADVENTURERS!

Adventure Data Base

Hardcore COMPUTIST is looking for more adventure hints to any of the popular adventure/fantasy games sold for the Apple II, II Plus or //e. These will be used in our regular column, ADVENTURE TIPS.

Your Clues, Please

We prefer that these hints not be dead giveaway solutions to dilemmas presented by the particular game, but instead contain just enough information to nudge the stumped adventurer towards the solution to his/her problem.

How & Where

So, if you know how to open the jewel-encrusted egg, how to plug the hole in the rowboat, where to find the key to the treasure chest, or any other tidbits of information that may be helpful to your fellow traveler, please send this information on a 3×5 postcard to:

Hardcore COMPUTIST
Attention: Adventure Tips
P.O. Box 44549K
Tacoma, WA 98444

P.S. Please don't forget to include the name of the adventure game to which your hint pertains and the name of the manufacturer.

ADVENTURE TIPS

Deprotecting Electronic Arts

By Pete Levinthal

Requirements:
48K Apple][,][+, //e with at least one DOS 3.3 disk drive
Super IOB
A sector editor
A blank disk
Cut and Paste, The Last Gladiator, or One on One from Electronic Arts

Electronic Arts' recent releases have all used very nearly the same protection. Their protection scheme has been to change the data field prologue bytes from a normal "D5 AA AD" to a modified "D5 BB CF" on tracks $03 to $20. Tracks $00 to $02 contain the modified RWTS to read the new data field bytes and hi-res title page. These three tracks are unprotected normal DOS 3.3. In addition, these recent releases have a nibble count on track $22, and track $21 is unused.

Remember that the prologue data field bytes tell DOS where the data starts on a sector. This is usually identified by the unique sequence of bytes "D5 AA AD". Electronic Arts has modified these to "D5 BB CF" so normal DOS cannot tell where the data starts and hence, an I/O error occurs when copying with COPYA (or some bit copiers for that matter).

So, to deprotect the new Electronic Arts releases we must:

1) Read the original disk with data field prologue bytes of "D5 BB CF".
2) Write to a normal DOS 3.3 disk with normal data field prologue bytes of "D5 AA AD".
3) Change the modified Electronic Arts' RWTS to read normal "D5 AA AD" data field prologue bytes.
4) Disable the nibble count.

Easy enough, right? We can use Super IOB to do most of the work and then use a sector editor to complete the process. Here is the procedure:

1) Enter the Super IOB controller at the end of this article and save it as EOA.CON.
2) With the Electronic Arts controller installed, run Super IOB.

What Happened?

When Super IOB is finished, it will have made these sector alterations:

Trck	Sector	Byte	From	To
01	0F	68	20	18
01	0F	69	A2	60
01	0F	6A	A1	EB
02	03	47	BB	AA
02	03	51	CF	AD

If you have copied Cut and Paste, then that's all. Enjoy your backup. If you have copied The Last Gladiator or One on One, then you will need to pull out your sector editor and make the following modifications (to the copied COPYAable disk):

The Last Gladiator

Trck	Sector	Byte	From	To
1F	0E	05	A0	18
1F	0E	06	20	60
1F	0E	68	20	18
1F	0E	69	A2	60
1F	0F	05	A0	18
1F	0F	06	20	60
1F	0F	68	20	18
1F	0F	69	A2	60

One On One

Trck	Sector	Byte	From	To
09	02	1F	01	FD
0C	04	05	A0	18
0C	04	06	18	60
0C	04	07	88	C8
0C	04	DC	A0	18
0C	04	DD	FF	60

Now you're all done! Don't forget to write the sectors back out to your COPYAable copy as you change them.

Electronic Arts Controller

```
1000 REM ELECTRONIC ARTS
1010 TK = 0 : ST = 0 : LT = 33 : CD = WR
1020 T1 = TK : GOSUB 490 : IF TK > 3
     THEN RESTORE : GOSUB 210
1030 GOSUB 430 : GOSUB 100 : ST = ST
     + 1 : IF ST < DOS THEN 1030
1035 IF TK = 2 THEN GOSUB 210
1040 IF BF THEN 1060
1050 ST = 0 : TK = TK + 1 : IF TK < LT
     THEN 1030
1060 GOSUB 490 : TK = T1 : ST = 0 :
     GOSUB 230 : IF TK = 0 THEN GOSUB
     1110
1070 GOSUB 430 : GOSUB 100 : ST = ST
     + 1 : IF ST < DOS THEN 1070
1080 ST = 0 : TK = TK + 1 : IF BF = 0
     AND TK < LT THEN 1070
1090 IF TK < LT THEN 1020
1100 HOME : PRINT "DONE^WITH^
     COPY" : END
1110 POKE 19015 , 170 : POKE 19025
     , 173 : POKE 18024 , 24
1120 POKE 18025 , 96 : POKE 18026
     , 235 : RETURN
62010 DATA 213 , 187 , 207
```

Controller Checksums

```
1000  - $356B      1070  - $6E5D
1010  - $B295      1080  - $F4D4
1020  - $2D67      1090  - $0382
1030  - $3B66      1100  - $C5DD
1035  - $7413      1110  - $5021
1040  - $D8E6      1120  - $41C5
1050  - $8451      62010 - $A907
1060  - $6658
```

Continued from page 6

spaces should follow the word "DUPLICATE". Without knowing the correct number of spaces, I can't get the checksums to match up.

2) The process for BSAVING RWTS.13 is not clear to me. I have no DOS 3.2 programs that I know of and START 13 and BOOT 13 appear to to waiting for me to insert a DOS 3.2 disk. How can I get the RWTS.13 to BSAVE?

J. Myslinski
Toms River NJ

Mr. Myslinski: Although in the listing of Super IOB it appears that blank spaces follow the work DUPLICATE in line 10100, there really are none. To minimize problems such as the one you have, we are now printing BASIC program listings with delta characters inserted where blank spaces must be typed in.

The easiest way of acquiring RWTS.13, if you don't have a DOS 3.2 disk to boot after BRUNning BOOT13, is to use the code relocation feature of the Programmer's Aid ROM. This requires that you have a language or Integer firmware card:

1) Boot your system master (so that Integer BASIC gets loaded into your language card).
2) Load the MUFFIN program

BLOAD MUFFIN

3) Enter Integer BASIC and then the monitor

INT
CALL-151

4) Move the DOS 3.3 RWTS out of the way so that it doesn't get destroyed

1000<B800.BFFFM

5) Initialize the code relocation feature of the Programmer's Aid

D4D5G

6) Tell the relocater what is to be relocated and where it is going (Note: The asterisk at the end of the line must be typed.)

B800<1900.20FF^{CTRL}Y*

7) Move and relocate the first hunk of code

B800<1900.1B8B^{CTRL}Y

8) Move without relocating a data table

.1DFFM

9) Relocate and move the last section of code

.20FF^{CTRL}Y

10) You now have a working version of the 13 sector RWTS. Move it to a safe place.

1900<B800.BFFFM

11) Now move the normal DOS 3.3 RWTS back to its original location

B800<1000.17FFM

12) Save the RWTS

BSAVE RWTS.13,A$1900,L$800

RESET Problem

I am writing to say that Earl Taylor and Steve Morgan's softkey for Bank Street Writer in Issue No. 9 works great, as does the softkey for EDD III. I do have a question about RESETS, though.

I have a modified F8 ROM, thanks to Ernie Young's article in Hardcore COMPUTIST No. 7. My question concerns two programs by Sirius Software: Beer Run (purchased in 1982) and Type Attack (purchased in 1983).

I can RESET into the monitor with Type Attack, but with Beer Run I get a noisy reply and the disk reboots. All attempts to use reset on this program have failed. Could you please shed some light on the reason why my modified ROM will not stop Beer Run from rebooting?

By the way, Beer Run is the only program with which I have not been able to RESET out of.

John Edmondson
Mechanicsville VA

Mr. Edmondson: We suspect your letter and Hardcore COMPUTIST No. 12 have crossed each other in the mail, as Clay Harrell's "Deprotecting Flip Out" article in that issue describes a similar problem he encountered with another Sirius product: Flip Out.

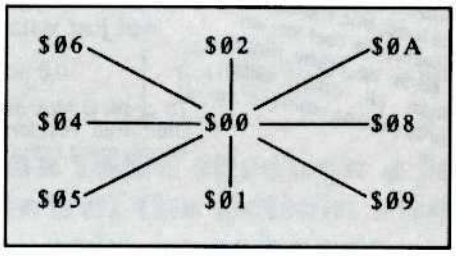
We suspect that you have a language card lurking in one your computer's peripheral slots into which Beer Run has written an image of the autostart F8 ROM. Try removing the language card before you attempt to capture the Artesians.

Continued from page 13

before updating you. At location $59BA you will find the STA $432B which stores this health value. By changing them to NOPs, we eliminate the limp because that location will always contain a $00.

Quick Draw McGraw

You may change the position of your gun by altering location $4342. The values which represent the various directions of your gun are as follows:



For example, if you wanted your gun pointed upwards and to the left, type

4342:06 (direction of gun)

Speedy Gonzales

You can instantly hop around within a room by changing location $4343. This location should hold a value from $00 to $3F. A value of $00 will put you in the upper left corner, $07 will put you in the upper right and $3F will put you in the lower right. For example, to move to the lower left square, type

4343:38 (position in room)

Beam Me Up, Hans

Sometimes it is fun to play Captain Kirk and beam yourself into another room. This can be accomplished by altering the value at location $4340. For example, to get to room 13 you would type

4340:0D (room number)
1284G

The 1284G is necessary so that the old room gets saved and the new one loaded and drawn.

The Lazarus Syndrome

Finally, to make yourself immortal, a patch can be made to the routine that BRUNs @INIT. The patch is:

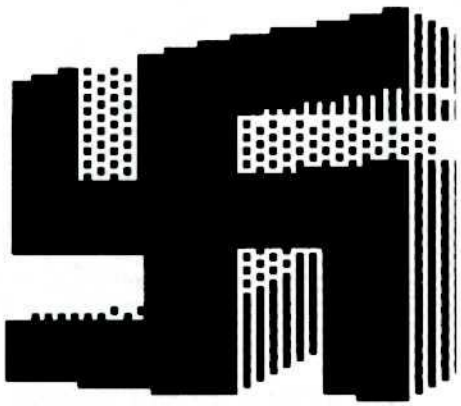
83B:4C 84 12 (immortality)

This will not stop you from dying. Instead, it will instantly resurrect you with the room setup the same as when you entered.

Final Notes

These are not all the APTs possible (they certainly aren't the best) and I would be interested in any APTs our reader's can come up with. I'm sure someone out there can find the voice pitch variable or maybe the combination of each closet.

Many thanks to Todd Kelsey for help with this article.



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..... News Of Note .....

Chapter 7 Blues

If you have been wondering what happened to your September 1984 edition of *Softalk* magazine, you might be interested to know that, according to the September 17th issue of *InfoWorld*, Softalk Publications Inc. filed for bankruptcy under Chapter 7 of the bankruptcy laws on August 22nd. Going down with the Softalk Publication ship are *Softalk* (Apple), *Softalk for the IBM Personal Computer* and *St. Mac* (MacIntosh). Earlier in the year, Softalk Inc. had ceased publication of *St. Game* (originally *Softline*).

Although we do not have any particular insights into why Softalk Publications should have come to such an untimely end, the number of pages in *Softalk* for the Apple had clearly been decreasing over their last several issues mainly due to diminished advertising. The accompanying drop in revenues probably dealt a fatal blow to *Softalk*. This sort of pinch has already affected a number of other industry publications which rely heavily upon advertising income.

Other computer-related magazines which will cease (or have already ceased) publication in 1984 include *Color Computer* (TRS-80 Color Computer), *PC*, *PC Jr.*, just plain *Jr.*, *CAP* (Computers Accessories and Peripherals), *Personal Software*, *Microcomputing* (originally *Kilobaud Microcomputing*), *Commander* (Commadore computers) and *Whole Earth Software Review* (to be merged with *Co-Evolution Quarterly*).

As *Whole Earth Software Review's* publisher, Stewart Brand said, *'It's a bloodbath out there, isn't it?"*

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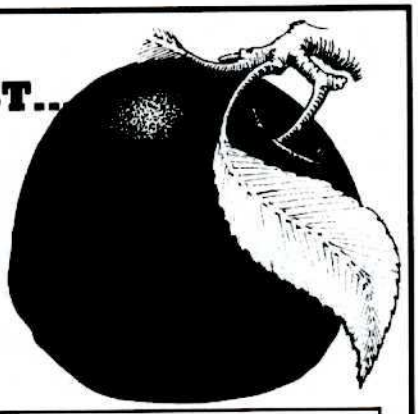

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