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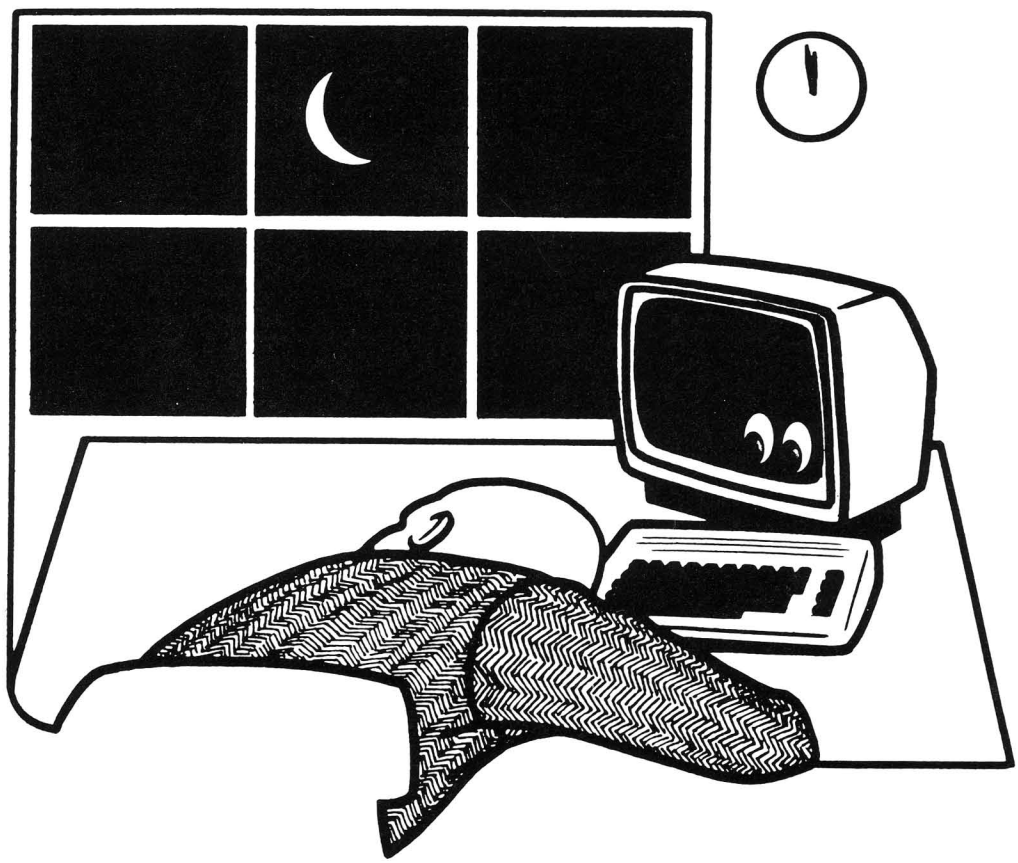

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The best deal in Commodore computing just got better.

The Intelligent Software package: an integrated home/business/educational package of **25 programs** on disk or tape at the ridiculous price of **$29.95** [plus five cents for postage + handling].

The package is not public domain or home-brew software; totaling over 51 pages of source code listings, it is the one product that can take care of all your data processing needs. One customer writes: ". . . *accolades for the authors. This is as slick a deal as I have seen and more than adequate for all except fancy presentations. The best thing is the ease of use* . . " The package includes:

Database: A complete multi-keyed fixed-record-length data base manager. Sort or select [using all relational operators:, = , >, <, AND, OR, NOT, wild card] on any field, perform computations on numeric fields. Any operation can be performed on all, or only selected records. All fields completely user-definable. Can be used for any number of tasks, including accounting, mailing lists, inventory control, record, tape, or book cataloging, expense account maintenance, or as an electronic rolodex. Even if you use your Commodore for nothing else, this program alone might justify its expense.

Word Processor: A full-featured menu-driven word processor including: very fast file commands, screen editing, text locating and full control over margins, spacing, paging, indentation, and justification. "*. . . well done and highly functional . . . Provides an excellent alternative to the high priced word processors . . . this is an excellent buy. Highly recommended.*" — Midnite Software Gazette. "*Provides good basic features.*" — Compute's Gazette.

Copycalc: An electronic spreadsheet. Turns your Commodore into a visible balance sheet; includes screen editor. "*Excellent program for budgeting, estimating, or any math-oriented use . . . well worth the money. Highly recommended.*" — Midnite Software Gazette.

Also included: **ReportGen, ReportMerge** [interface W/P with Database to create form letters, statements, invoices, mailing labels, other reports.]; **Baseball Statistician** [compiles batting statistics for a baseball league]; several W/P utilities, including **Index** [indexes W/P's text files]; several Database utilities, including **DBmerge** [facilitates multi-file database applications.], and **DBStat** [analyzes D/B files]; a programming utility, **ASCII,** which converts text files [program listings] into program files; also **Checkbook**; **Inventory**; **Paper Route**; **Loan Analysis**; **Breakeven Analysis**; **Depreciation**; **Labeler**; **File Copier**; more.

Versions of the package are available for every Commodore computer having a minimum of 10k RAM. All programs will support tape, disk, and printer. Price includes documentation and shipping; Calif. residents add 6%. Add $3 for credit card, COD, 8050 disk, or cassette orders [cassette not available for Plus4™ and 16™.] No personal checks from outside USA. This ad is the catalog; a sampling of program output is available for $2.

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Congress is facing pressure to do something about the current trade imbalance between the United States and Japan. Though the reasons are complex, some relate to computers. Current U.S. tax structure favors capital-intensive "smokestack" industries over "hi-tech" firms, yet the only areas in which the U.S. are still fully competitive in the world econony are agriculture and high technology. Both are in decline this year, with farmers and electronics firms going out of business in large numbers. As Congress considers tax reforms this year, I hope it will put our industries on a more equal footing.
A related matter is that in Japan companies work together to plan long-term strategies; here each company is required by anti-trust laws to work alone. Traditional American short-sightedness assures short-term plans. This puts us at a competitive disadvantage against "Japan, Inc."
To make matters worse, for many Americans the only way to advance is to leave for another firm. Among many hi-tech firms this has become a way of life, with engineers and others changing firms every few months--or years, at most--and taking many trade secrets with them. In Japan, joining a company is much like getting married. The company is like a family, and hopping from firm to firm is rare. Although the Japanese are just as competitive as Americans, within the company the goal is cooperation, not competition. It appears that their system may work better than our own.
Though rarely discussed, another reason for America's trade woes is our huge military budget. Few of our allies spend as large a share of their national wealth on arms, and that gives other countries a competitive advantage.

Apart from the Amiga, perhaps the most exciting new development in the micro world is the invasion of the generic PC. After five years, the IBM PC has become well enough known that perfectly acceptable copies can now be purchased with the same ease as buying plain aspirin instead of Bayer's. It is now possible to buy a virtually perfect copy of the IBM PC system unit for as little as $400. Naturally, that's not an all-inclusive price, but it's not much different than saying you can buy a C-128 for $300. In both cases you have to buy a disk drive and monitor, plus a keyboard, DOS, and display adaptor in the case of the PC clone. The interesting part, however, is that when you're all done you can spend less for a dual disk 640K RAM PC than for a one disk 128K C-128. This doesn't necessarily mean you'd want a PC instead of a C-128; anyone who enjoys computer games on the 64 would be apalled by the pathetic quality of PC games. On the other hand, this new development may make the 128's CP/M mode a very weak alternative to comparably-priced PC systems. PC DOS and its business programs are much improved over CP/M. Thanks to fierce competition in the PC software market, excellent business programs of every type are now available for under $50 dollars retail, so C-128 users will not save much on software compared to careful PC shoppers.
For those with a few hundred extra to spare, it is possible to vastly improve on IBM's PC, and still for less than the cost of a Boca Raton original. At least two suppliers now offer a PC clone that is

significantly faster than a real PC for under $1,000. Both can also accept a $500 ten Meg hard disk, yielding a machine almost as good as the PC XT's sold for $5,000 last January.

The bottom line? The micro market has finally stabilized enough to be compared to other industries. This stability may be as fleeting as the eye of a hurricane, but is truly welcome after seven years of tumultuous changes. Who wins in such times? Consumers who can buy less for knowing which programs will be usable a year after purchase, and companies lucky enough to offer the products everyone wants. IBM is still prospering, although it's PC DOS and PC are now beyond control and will probably be with us in recognizable form into the year 2000. The Apple][will also survive now that Steve Jobs has quit dumping on it. The Macintosh can struggle along for awhile as is or be remade into a more successful product along the lines of the Amiga. The new Apple management surely will choose the latter course and make the Mac into an open architecture, PC-compatible machine with a long happy future. Commodore should be quite successful with its Amiga. The 128 is also proving successful, and can be made even more attractive by swapping its 64K RAM chips for 256K RAMs. Everyone else, including feisty Atari, may be reduced to riding on the coattails of one of these few market leaders.

An extra note:

As many of you have noticed, this issue is late. This monthly format/schedule is a bit un-nerving but we will not renig on our commentment to STAY monthly. With our 'at the last minute' deadline the issue is a bit behind the calendar but the information enclosed is not. Please bear with us as we feverishly work to get back to a schedule of publishing closer to calendar dates. You will be getting a postal card letting you know of your subscription status. This is mainly due to the time and expertise involved in converting all files over to our Commodore PC-10 computer. Please enjoy the issue and SEND THOSE REVIEWS IN! JO

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Commodore 64 in Wonderland (155pp) and **The Commodore 64 Playground** (135pp)
by Fred D'Ignazio.
Books with diskettes for the C64.
Hasbrouk, NJ. Hayden Books, 1984.
Unprotected. Limited warranty.
$24.95

These two products are standard educational packages for children. Each includes 20+ number, spelling, word, and keyboard games and tutorials. **WONDERLAND**, for ages 8 and up, is a respectable collection with several good games. **PLAYGROUND**, for 6 and up, while identical in format and similar in content, does not offer the same quality. The better games, such as "Book Report" in **WONDERLAND**, are interesting, easy to understand, useful, and fun. In each collection, some of the programs are hard to follow and confusing. A phonetics program in **WONDERLAND**, "Fat Cat," asks the player to match phonemes with the sounds of a given word. In some cases there are multiple correct answers, but the game only recognizes one. A child could be right and still get a frowning face.

Instructions range from excellent to poor. Some of the games require color recognition (a good color monitor required), pitch recognition, or both. These could be frustrating for most youths. With a little bit of help in selection, each package has enough to inform and entertain a child for several hours.
There is a possible second market for these packages: novice BASIC programmers. Most of the coding, all of it written by high school students, is fairly clear, usually straightforward, and occasionally elegant. Each chapter, one for every game, has suggestions for modifications. While too sophisticated for the children who would play it, these programs can give high school or adult novices good examples of how to program, ideas for new programs of their own, and teach simple graphics, sound, and good method. RECOMMENDED
Tim Sickbert

PROJECT SPACE STATION
Unprotected disk (requires dongle).
$24.95 for C64.
Space Station Construction Set from HesWare, 150 North Hill Drive, Brisbane, CA 94005.

Project Space Station is a very sophisticated, somewhat complicated program in which you have the full responsibility for building a space station in space. As Hes puts it in their manual "This is not a game. It is a mission simulation."

You are responsible for obtaining funds; purchasing equipment; selecting and scheduling crewmembers; picking the best shuttle on which to send your equipment and the best dates for launch, and getting the space station built.

Virtually every factor encountered in real life is present in this simulation, including weather problems and personality clashes among crew members if you are not careful in your selection.

There is a very extensive and well-done tutorial included on the disk, and the manual is very well written...if these two items were <u>not</u> well done, the program would be virtually impossible to manage!

The program makes extensive use of

icons and the graphics are quite good. Everything functioned as it was supposed to except a slight problem with the disk save feature, which may have been an equipment problem. Joystick operation is a little more convenient, but the keyboard can be used as well. The program works quite well on a C128 in 64 mode.

Although Hes advertises this as being for "ages 12 and up", I feel that might be a little young for this program. It will take a lot of work to master all the facets of this program. Highly recommended for those with an interest in the Space Program and the patience to master the simulation. -Art Lewis Kimball

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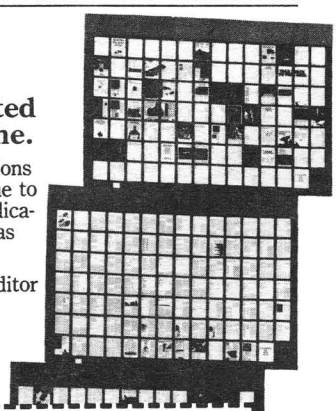

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Two and a half years have passed since the C-64's introduction. In this time the market has matured. For those who have matured with their machines and need bigger, faster data access there are now Fiscal Information's 10 and 20 MEG. hard drives. Connected to your C-64, the FI drives deliver speed and reliability, two features lacking in any other drive on the market: bar none. The FI drives are 43+ times faster. It does 24K loads in under three seconds and 8K loads so fast as to become simply a command.

The FI drive supports all BASIC 2.0 and over forty new disk commands including: build, copy, err(or), 'L' (for load), lu (logical unit: used like you would for a drive number), era (erase), oops (VERY handy: brings back the last prg. you scratched and renames it oops), renum (renumber), cleanup, config, merge, and a real handy command called 'txa' which is a rapid copier for transfering floppies to the hard drive. Name a program 'autostart' and the system will load and execute it on powering up. (This is especially handy when using a PUNTER BBS as Micro-PACE/MIDNITE does. We renamed Punter's 'startup' program and modified it so that if power goes out the bbs will re-boot and go back on line by itself.) One problem, soon to be resolved, is that the DOS doesn't allow for variable strings to be used as filenames for disk access.

The only other limitation is that the OS replaces Kernal ROM, making jumps to the Kernal bug out (also to be corrected), but no BASIC memory is used so you still have 38911 BYTES free. The FI drives are HIGHLY RECOMMENDED. JO

CALC NOW
$39.95 spreadsheet from CardCo for the C64. Disk. DOS protected. No statement of warranty. Compatible with **Write Now** (not tested). Printer optional.
CALCNOW is a very good spreadsheet for the C64 that suffers from a few striking weak points. All the major spreadsheet functions seem to exist, and a few features are included that I've never seen on any other micro- or mini-computer spreadsheet before.

CALC NOW gives 39K available memory with no disk access during execution, and has a very wide range of options: individual column size, split screen, auto/manual recalc, insert/delete row/column, sort, cell protection, on-line mini-help, absolute/relative addressing, formula editing, GET and FIND, formulas may be printed and have comments, calculator mode, saving of partial files, and merging of files.

CALC NOW is driven by dedicated keys rather than commands. This is to make it easier to use, but can actually inhibit proficiency when the dedicated key functions conflict with those of other programs. The program gives no way to insert/delete more than a single row/column or erase more than a single cell at a time. Cells may not be formatted before they contain data, and may not be preformatted in groups. Disk commands are available, but "initialize" formats the disk; I almost lost my data disk by mistake. **BAD!** There are no "Page up" or "Page down" commands, just a less convenient "Goto." The drive may not be queried for status. Having paid full price for the program, I recieved only a terrible "temporary manual." If I were a novice to spreadsheets I'd be lost. CardCo says a full manual will be mailed.

So, while good for home and light business, the lack of Page Up and Page Down make it inconvenient for larger applications. If it cleans up the sore spots in updates, it could be a real winner. RECOMMENDED.
Frank Figlozzi

MIRAGE'S WORD PROCESSOR, PRO VERSION $40
wordprocessor/spellchecker for the C-64. Mirage Concepts, 4055 W Shaw #108, Fresno, CA. 93711

The **MIRAGE** is a great little program that used to sell for about twice the price and truly is "professional." The easy to use manual contains two tutorials: one to get started and a second for more advanced functions. As with PAPERCLIP, you design you own printerfile to accomodate your printer or interface.

The fun starts, not in the fancy cursor manipulation (it scrolls like lightning) but in the use of 'blocks'. Define any size paragraph or page as a 'block', copy it anywhere, move it around, save it, pop in another from disk, or erase it. Cursor is either destructive or non-destructive, and there are probably more cursor controls than most people will ever use. And any time you like, you can toggle between 40 and 80 column modes.

Another echo of **PAPERCLIP** is column manipulation. With a number of commands you can juggle data listed beneath columns from one column to another beside it. Kinda like the

shell game. Some have questioned its memory available for text, but with the file chaining options this should not be a problem. And for sending form letters that look individualized, MIRAGE provides for merging standard sequential files.

The dictionary is a colossal joke! This turkey uses over half the disk to retain a huge compendium of words. (You can make it bigger if you like.) When called, it will take seven minutes to compare every word in your document with every word on its list, then takes just as long when you ask it to give words in its dictionary that are similar to the ones that you have and it doesn't. Sound confusing? It is! See, spelling checkers do not simply correct misspelled words. They merely compare your words with theirs. If there is no match, they let you know. If the word doesn't look right to you, you may ask the checker to produce similar words and you get to decide which one looks better. If, on the other hand, you publish Horizon magazine and are convinced that "separate" is spelled "seperate," you will likely assume that "seperate" was not it its dictionary. Dictionary--the handheld version made of paper and some fancy cardboard is much quicker and more accurate.

All in all, I would recommend Mirage's word processor to anyone who has not had a good wordprocessing program before. But if you write letters less than once a week, I would suggest you stick with an easier program. RECOMMENDED.
Tom Newcomb (Tri-City Commodore Computer Club Newsletter)

B-GRAPH
$39.95 bar graphing aid on disk. Abacus Software Inc., POB 7211, Grand Rapids, MI. 49510
"A picture is worth a thousand words"--a phrase as true today as when it was first uttered. **B-GRAPH** will allow you to present business, scientific, stockmarket, or weather data, or anything else that you can express in numbers, as a picture. This program could be used by many people who will probably never consider buying it. "What would I use it for?"

-Present your club budget.
-Track your weight loss.
-Picture your child's grade point average
-Track your little league teams batting average.

The "Tutorial & User's Manual" is well done and provides an introduction to the graphing of data. If you know the type of graph you need, the menu driven system will lead you through the required steps to produce that graph. The second part of the program deals with statistical functions. If Poisson or Chi-square distributions don't turn you on, or if Kurtoisis and standard deviation mean nothing to you, make pretty graphs and forget the rest. If you understand greek, you will find the statistical package useful and well done. All the above, plus correlation and regression analysis are covered. The manual is a good short course in statistices; the program reduces data to a usable form with no pain or strain. In short, an excellent piece of software. RECOMMENDED.

Update (see M#'s 23,25): **FASTLOAD** $39.95 disk utility cartridge from EPYX.
A quick test: With **FASTLOAD** installed, load and run DISPLAY T&S from the **Test/Demo** disk that comes with the 1541. The next track will be given as 32. This is an error that traces to program line 420, an error in reading the command channel. Next, load and run DELPHI'S ORACLE (aka CONSULTANT). Write a sequential file on the same disk drive, or add or change a record. These cause a rewrite of a key file and will result in a "no-channel" error.

Then, to experience the chimerical "save with replace" bug, use **FASTLOAD** with sophisticated programs such as **EASY SCRIPT**, **MULTIPLAN**, **ORACLE**--or just use it to resave your BASIC programs. Sooner or later a file listed as "thisfile" will be replaced by "thatfile." No discrimination... program, sequential, or relative files can be lost. In short, you cannot use **FASTLOAD** without risk to save any type of data. And don't even try to save high scores on **JUMPMAN**, also by Epyx.

Don't toss **FASTLOAD**. It will load most files and retrieve data stored by the above programs. If you install a reset button you can leave **FASTLOAD** installed and disable it by using the main menu. The wedge, disk editor, and ML monitor which can be used safely are then readily available. Epyx is aware of this problem, but have not furnished a solution.
Tom Vernia. Vista, CA

UPDATE: **FONTMASTER** (cf. #26)
$25 disk for the C-64.
Wordprocessor from XETEC. Requires dot matrix printer with dot addressable graphics. DOS protected. Documentation booklet.

FONTMASTER is a more than a wordprocessor in the normal sense: it allows you to print in 15 different fonts. A sixteenth, "special," font is a collections greek letters in upper and lower case, scientific symbols, fractions and graphics. Each font can be printed in pica or elite; expanded, condensed, or normal; subscript, superscript, or standard; bold; inverse; or underlined. Many of these can be combined, and all are available at the touch of a couple of keys. If all this is not enough, the included font editor will allow you to modify characters or to create your own fonts.

On the other hand, the printer must work harder than usual. Each line is printed and then printed over. The result is much better quality at a much reduced speed. As more special features are added, more passes may be required. For making quicker copies without the fancy characters, a dot matrix mode will allow the printer to function at its normal speed. Unfortunately, there is no option to format a disk from within the program.

Like all wordprocessors, it takes some time to get used to **FONTMASTER**. The status display in the top four screen lines is always present. The easy-to-reach format screen allows you to control margins, headings, page numbers, etc. If I had to have just one word processor for a wide variety of applications, I would probably choose FONTMASTER. RECOMMENDED.
John Smith (from the NorthEast Ohio Commodore User's Group newsletter).

SSP: Save, Search, Print
Date and Calender program on disk for the C-64. ($24.95)
By Donald Davison, from Handic Software. DOS protected, no warranty. Printer optional.

A very elementary date and calendar program, **SSP** stores, locates, and prints data to printer or screen. One screen of data, keyed by date, can be saved for any specific month, day, and year. It is a menu driven, easy to use specialized application program. Its' global search feature will find any set of characters for any date stored on the data disk. It is fast enough and simple enough to be practical.

But: The documentation does not mention backup or warranty, and the load and save functions were reversed. The latter is no major problem as the menu is correct. The omission of an option to format a data disk is serious. **SSP** is an adequate diary or appointment calender, but I expected more from the company that produced **CALC RESULT!** Average. Roger E. Jones, Birmingham, AL.

GRAPHICS BASIC, Human Engineered Software, Brisbane,CA
Diskette. Price:$29.95

This extended BASIC by Ron Gilbert and Tom McFarlane gives over 100 additional statements to the user to easily program the 64 to draw on the hires screen; create, move, and animate sprites; and play musical notes. The 116 page manual is well-organized and contains numerous examples.

To program graphics, there are commands such as "box", "line", "circle", and "dot" in which the programmer provides parameters consisting of X-Y coordinates and size or ending coordinates. There are also commands to set the origin, scale, and colors of the hires or multi-color screens, and a command to include text on the same screen.

To create sprites, the built-in sprite editor--resident at all times--can be called up by simply keying in the command "edit" in direct mode. The screen clears, and a large grid is displayed. The sprite is created by filling in the squares formed by the grid. As this is done, a small box in the lower right-hand corner of the screen displays what the sprite will look like. Once you have created the sprite image, there are commands to rotate and invert the image. There is also a buffer into which a sprite image can be copied for use in definig other sprite images. Up to 32 sprite shapes can be defined, both in hires and in multi-color formats. After these sprite images are created, the shape of each sprite can take on the form of any one of these images. Sprites can thus be animated by stepping through the different shape definitions. There are commands to do this, as well as commands to smoothly move them in various directions at various speeds and to detect collisions.

The sound commands allow the user to easily choose the voice, waveform, ADSR, tempo, tone and volume of the sounds to be played. Lacking here are commands to control filtering and modulation.

Besides the graphics and other routines described above, this package includes a number of other commands to aid the programmer.

These include utilities to:

Dump the hires or text screens to the printer or disk;

Save previously-defined sprites to disk;

Re-define characters, allowing you to create customized fonts and save them to disk (a number of fonts are already included on the disk);

Perform scrolling and windowing smoothly and easily;

Write structured programs utilizing the "IF..THEN..ELSE" and "DO..PROCEDURE" clauses.

If you have been shying away from programming which includes graphics and sound, or have ever muttered to yourself "There's got to be an easier way!", I would definately urge you to pick this one up. Recommended Mark Lofland.

HESKIT-64 Human Engineered Software, Brisbane, CA
Cartridge. Price:$39.95

This is a cartridge which is designed to aid programmers in editing and debugging BASIC programs. Some of the features include:

Abbreviated keystrokes to insert, delete, and copy program lines.

Automatic line-numbering.

Screen dumps to the printer or to disk files.

The temporary pausing of listings.

The setting of tabs.

Some of the more powerful commands allow the programmer to search and replace text strings, compact programs by deleting extra spaces and REM statements, delete a range of lines, trace the execution of a program, restore a program after the NEW command has been issued, re-define keys, and to perform hexadecimal-decimal conversions. This software combines many useful and a few which, while not as useful as some of the others, are nice to have around should you need them. --- RECOMMENEDED Mark Lofland

C-POWER (C Language compiler)
by Brian Hilchie
$99.95 Disk For C-64, DOS protected. One year media warranty. Printer optional. From Pro-Line Software LTD

For the C-64, this very good **C** language compiler offers all the necessary tools. The only features not implemented, and so noted in the documentation, are bit fields and pointer initilization. Machine code can be accessed from C programs. A 'shell' program provides a mini command interpreter for all other programs included in **C-POWER**. The programs you write can run under the shell or separately as 6510 machine code. Available under the shell are a regular and a syntax checking editor, compiler, linker, and print utility. Only the compiler is copy protected. Documentation is provided for 100 standard functions. Source code is provided for 9 example programs.

Easy to use, **C-POWER** is nearly fully compatible with Kernihan and Ritchie standard (**THE** STANDARD!) with exceptions noted. It a very popular book from SAMS, **C PRIMER PLUS** by Waite, Prata, and Martin for it's coding documentation (531 pages.). Compiles into 6510 object code or 'shell' driven code. Package includes all you need to use and learn the **C** language. will work with one or two disk drives. Excellent value.

Compiler specific documention (not the book) is somewhat difficult to read (not enough examples). The book is good for beginners although it contains some confusing, albeit minor, errors.

This program will be good for anyone who wants power and speed of assembly coding usiing a highly structured language. **C** is currently the most popular portable language being used to write operating systems, and many other applications, including the **UNIX** environment. The **AMIGA** operating system is written 80% in C. HIGHLY RECOMMENDED. Roy Wagner, Westminster, CA.

PRO-TERM64 Diskette. $39.95 for C64. 30 day limited warranty. Terminal Package from King Microware, Montreal, Canada H3S 1Z6.

Pro-Term64 may well be the ultimate terminal package for Commodore users! Once the system has been configured, virtually any telecommunications system can be accessed with one or two keystrokes.

The program supports XModem (crc or checksum), Punter (new and old), and .IMG transfer, and has full VT100 and Televideo 910/920 emulation. There are TWO buffers; a 4k buffer (useful for holding Help screens, etc.) and a 20k buffer for capturing text. A 'Get Screen' command captures an entire screen and dumps it into the buffer whether the buffer has been opened or not.

Each system you access is configured **completely** and accessed with a keystroke when you are ready to call that system. The configuration includes baud rate, parity, word length, duplex, stop bits, 40/80 column, auto-logon (using prompts, not timing) and even an option that will automatically store your 'on-line' time for each contact. The 20-number telephone book allows you to specify different delay rates for each number when auto-dialing and even allows you to cycle through all 20 numbers looking for a 'free' line.

Streaming to disk or printer is supported as well as the usual dump of the buffer to disk or printer. Function keys can be programmed with up to 30 characters including escape and control characters. Another nice features is a 'release cursor' function which allows you to go back and over-write a line already entered on a Punter BBS.

Most of the popular brands of modems are supported with the exception of the Commodore 1660. It is our understanding that the author is now working on an update to include the 1660 as well. If there is any complaint to be found it is only that the program has not made use of King Microware's 'speed loader' used in Rhapsody...and load time is a little lengthy. It is our sincere hope that this program will soon be available in C128 format. Enthusiastically and highly recommended! -Art Lewis Kimball

SUPER BOX 64
IEEE Interface/Expansion Box for C64. $149.95 from Handic Software, Stockholm, Sweden.

This new product from Handic seems to work every bit as well as the Buscard II from Batteries Included, however it doesn't include the versatility of the dip switches allowing individual control of various peripherals. If two drives are connected as device 8, one to the IEEE and one to the serial bus, the serial bus will take priority.
As with the Buscard II, a connection to R44 allows the Super Box to operate without losing any RAM, and any of the three cartridge expansion ports can be used in conjunction with the IEEE function. When the connection is made to R44, the built-in reset switch can be used without loss of RAM.
This device seems to work very well with the C128 in 64 mode, without, of course, the connection to R44 which seems to have been left out of the design of the new computer. -Art Lewis Kimball

SNAPSHOT 64
$39.95 Cartridge Disk Backup for C64 from Marshview Software, Canada

Several new products have hit the market in the past few months which claim to make backup copies of virtually all software using a cartridge which captures the entire program after it is in memory. So far, **Snapshot 64** (formerly Codebuster) is the only one that lives up to its promise.
Snapshot is extremely simple to use. A program is loaded into the computer in the normal way. When the program is loaded and an option screen appears, the button on the **Snapshot** cartridge is pushed, the program is captured, broken into several files and written to a disk. This backup program can then be loaded on virtually any disk drive without worrying about head-banging etc. Also resident in the **Snapshot** cartridge is **Code Inspector**, a monitor that allows you to examine the entire contents of memory at the time you captured the program.
Snapshot worked on nearly every program we tried. One program refused to work quite properly and another could not be copied at all...but most programs were copied successfully. It also worked quite well on the C128 in 64 mode.
Programs which require disk access after loading are a little more complicated, but usually only the main or loader programs are protected, so it becomes a matter of copying the needed files to your new disk.
As of right now, **Snapshot 64** is probably the best solution for making backup copies of those expensive programs that the manufacturer decided you didn't need any insurance for! Recommended. -Art Lewis Kimball

Mon 64
$34.95 Machine Code Monitor Cartridge for C64 from Handic, Sweden.

Mon 64 is a cartridge machine code monitor for assembling, testing, and debugging programs written in 6510 machine code. There are dozens of machine code monitors available for the C64, but once again Handic seems to have found a niche by going one step further in producing a product.
This monitor, as far as we know, is the only one available that allows you to work in **all** of the C64's RAM

and ROM. A unique feature of the Save command allows you to Save both RAM and ROM, so that you can save the RAM that lives "under" ROM...making all 64k of RAM available for use.
A switch on the top of the cartridge allows the monitor to live in either of two locations, depending on what you are going to do. In the 'Auto' setting, the monitor is located between $A000 and $BFFF and is activated at powerup of the computer. This, of course, replaces BASIC and programs cannot be run with the monitor in this location.
With the switch placed in the 'SYS32768' position, the monitor is located between $8000 and $9FFF and is transparent at powerup of the computer. In this position, the monitor can be activated by using the RUN/STOP-RESTORE keys, or by SYSing 32768.
A reset button is also placed on the top of the cartridge for those times when the dreaded 'machine code Bug' throws a monkey wrench into the works.
All of the other common features of machine code monitors are available as well as a SEEK operation of individual bytes, the ability to write text directly to memory; a WALK operation that executes the program step by step; and Quicktrace, which executes a program stopping if a breakpoint is found. Both Memory Display and Disassemble commands allow scrolling, which makes life a lot easier! A help screen is available by using f7.
This is a very straightforward monitor to use with some very nice features for anyone who does serious 6510 programming. Highly recommended. -Art Lewis Kimball

LT. KERNAL
10/20 Meg Hard Drive for the 64. $1595/$1995 from Fiscal Information Inc., Daytona Beach, FL

Assuming J.O. has covered all the "techie" aspects of this fantastic drive, I'd like to add my two cents worth.
I was highly impressed by the virtually total compatibility with the C64...something almost unheard of in a third-party drive of any kind where Commodore is concerned. But what impressed me even more is the fantastic customer support from FII.
While setting up the drive to work with a Punter bulletin board, we literally spent HOURS on the telephone with Roy Southwick, one of the designers of the drive. Roy was available day or night to help us with problems and tell us how to accomplish the things we wanted to do. In trying to trace down one problem, I called Roy at home at about 7 p.m. and his wife said she would get ahold of him and have him call me. About 45 minutes later Roy called me back from his office, having returned there following a raquetball game when he learned I needed some help!
This kind of customer support is rare in the computer industry, and there is no way to set a price on its value. Not only is the product one that we can highly recommend with no reservations...but the dedication of the people behind the product is an added incentive to deal with this company. This is Fiscal Info's first venture into Commodore territory...but you can be sure you'll be hearing from them and about them from now on! Art Lewis Kimball.

Essex
$39.95 Two diskettes/book adventure for C64 from Synapse/Broderbund.

Essex is the second "Electronic Novel" from the Synapse/Broderbund partnership. In this adventure you must find the missing Professor Ignatz Klein, who is the only person in the universe who has the knowledge necessary to defeat the dreaded Vollchons who are bent on taking over the Galaxy. Before you can do **that** you must find the elusive captain of your Starship, find a much-needed Trilithium crystal, and complete a number of other chores.

This adventure is really a good one. The puzzles are clever, the action is intriguing, the characters are interesting, and the game is very well written. Unfortunately, all of this is not enough to make this a viable contestant in the adventure game field.

Synapse did a lot of ballyhooing before **Mindwheel** was released, about their "BTZ" (better than Zork) language. They were going to knock Infocom out of First Place in the Adventure field. With the release of that game, it was obvious that they had bitten off more than they could chew. I had hoped that after that experience, they would go back to the drawing board and learn how to do it right, but they haven't.

The parser is **not** more sophisticated than Infocom's; the text is full of mis-spelled words; and fraught with clumsy syntax..."You successfully drop a hammer..."; "In record time you pick up a hammer..." When you say "Examine the lockers" you see: "One locker seems to be unlocked. Among all the closed lockers is one unlocked locker."

In order to enter the game, you must type a certain word from a certain line on a certain page in the accompanying book. This is a very clever security device which I praised in my review of **Mindwheel** since it leaves you free to make a protection copy of the disk and doesn't interfere with loading from another drive. But then they turned around and did a really irritating thing. In order to resume a saved game, you must first get into the game by entering the designated word. Then, after loading your saved game, you must type **another** designated word from the book...a totally unneccessary procedure!

But all this might be forgivable if it were not for the absolutely **intolerable** disk access. Without a word of exaggeration...**each and every** input is followed by a disk access of from 10-60 seconds! The text is printed to the screen practically one word at a time and if the room description is at all lengthy, it can take up to **three minutes** between the time you enter the command to move to another room and the time you can enter another command! And apparently **nothing** is stored in memory...because if you take a second 'look' at the room you are in...you have to wait for **another** interminiable disk access!

On top of this, for some strange reason, after the final word has been printed to the screen, the drive appears to be doing some kind of access for another 10 seconds or so before you get a command line. If this wasn't **enough** to drive you crazy...they have chosen to put the command line in a window at the

bottom of the screen...and this line must then be read, checked for syntax and then **re-printed** to the main screen before the drive even **starts** looking for any information.

If you have ever done a Telarium adventure or some of the other graphic adventures which slow down the action....you can double and sometimes **triple** that time for these Electronic Novels. I know of very few adventurers who will be willing to put up with this aggravation for what is at best a 'good' adventure game. Not recommended unless you are an addict who is going through withdrawal symptoms and have a **lot** of patience! -Art Lewis Kimball

SUPER ZAXXON Human Engineered Software Brisbane, CA
Diskette. Dongle-protected. Joystick required. Price:$29.95

This game, while not exactly like the arcade original, is still challenging and a lot of fun. For those of you who have never seen the arcade game, the object is to pilot your space-plane through a 3-dimensional obstacle course while destroying enemy targets and avoiding their fire and other barriers between you and your goal. With each successfully-completed course, the obstacles become trickier to navigate, and the enemy defenses stronger. Though the controls seem sluggish sometimes, the graphics and sound are well done. ---RECOMMENDED Mark Lofland

CELL DEFENSE
Game disk for the C-64. DOS protected. Joystick required. From Human Engineered Software; concept, design, and manual from Childware. 90 day media warranty

CELL DEFENSE is almost a great game. It's only possible flaw is its aspirations to be educational. And it doesn't claim that aspiration. The manual alone is a good, very short, tutorial on basic human immune defenses. That is the only education. Without the manual, the game is a good quality defensive arcade game. There are four factors determining the range of difficulty; each of these factors has a range of 8 values. And each affects a different aspect of game play! This game can be played by a child without frustration or by a joystick virtuoso without boredom. While it has only a relatively small range of sprites, these are well used to provide a total of virtual 4096 screens. Without a doubt ... RECOMMENDED!
Tim Sickbert

TURTLE TOYLAND jr.
Educational/game disk for the C-64. DOS protected. DOS protected, joystick required. Color monitor desirable. From Human Engineered Software and Childware. 90 day media warranty.

This package claims to be an introduction to programming. In many ways it is. And I wouldn't know what else to call it. In addition to sprites, graphics, and sound, it teaches the greatest truths of programming--frustration and patience. To begin with, the manual. It barely manages to cover everything and covers nothing well.

The directions, even when I am sure they are correct, are often unclear. If you get this for your youngster, master the package yourself first, otherwise you will simply multiply your frustration.
The only part of the package that works at all well is the sprite editor. Pretty standard, one moves the turtle around a grid, pen down, to trace the shape of a sprite. Then, on another screen, the turtle drags the completes sprite across the screen and points in the direction it is to move. One more step, to give it speed, and it is on its way.
The graphic "playground" and the music editor are poorly done. When creating graphics, moving the turltle gives the number of pixels moved. Changing direction starts the counting all over. This makes it a major project to draw a simple square--one pixel off and two lines need to be redrawn. An absolute position indicator would be invaluable. The music editor steps the pitch higher only, to the top of the octave. If, in trying to sound out a song, one overshoots the next note then its easy to lose track of the tune. Not for a six year old.
The central part of **TURTLE TOYLAND jr.**, the playground, allows different graphics, songs, and sprites to be shown in a user defined sequence with loops, to reshow a section of the "filmstrip," timing, to make it run smooth, and stepping, to do who knows what. The manual certainly doesn't explain it. Some of this would be easier in BASIC, even for a six year old. I would like to give HesWare and ChildWare credit for the concept and the attempt. The execution is...POOR.
Tim Sickbert

#%!!!# CURSORING AGAIN!!

A very useful technique (and unfortunately omitted in the 64's ROM) is a method of placing the cursor where you would like it without a lot of painful PEEKS & POKES. A common technique for positioning the cursor at a specific row and column involves the KERNAL routine PLOT. The general technique is useful but can be unreliable when accessed through the KERNAL jump table at 65520 ($fff0).

```
fff0  4c 0a e5  jmp $e50a  ;
   jump table entry for PLOT
```

```
e50a  b0 07     bcs $e513  ;
   if the carry is set then GET
   the cursor position
e50c  86 d6     stx $d6    ;
   store .X register in current
   cursor line number
e50e  84 d3     sty $d3    ;
   store .Y register in current
   cursor column number
e510  20 6c e5  jsr $e56c  ;
   go to the routine to set the
   cursor's position
e513  a6 d6     ldx $d6    ;
   current cursor physical line
   number to .X register
e515  a4 d3     ldy $d3    ;
   current cursor column number
   to .Y register
e517  60        rts        ;
   return from call to PLOT
```

As can be seen at $e50a, if the accumulator carry flag is set, the routine will GET the current cursor position! Not exactly what we had in mind. To correct this the current row and column coordinates should still be placed directly into the register storage area in 781 ($030d) and 782 ($030e). Then simply bypass the logic of the

cursor get/set routine at $e50a and SYS directly to 58636 ($e50c). In both the VIC 20 and the Commodore 64 this will work:

```
POKE                    781,row:POKE
782,column:SYS58636:PRINT'message'
```

Now lets talk a little about some other things you can do on a 64 only. First, the following line is an alternative to the above example:

```
POKE211,column:POKE     214,row:SYS
58640:PRINT'message'
```

This enters the plot routine a little later (at $e510) and avoids two steps (a
big deal at ML speeds). But if you do this a lot in a program,here is a neat 25
byte machine language routine that makes life a little simpler:

```
0806  20 fd ae  jsr $aefd  ;
      scan past the comma
0809  20 8a 8d  jsr $ad8a  ;
      read row from BASIC line and
      put in accumulator #1
080c  20 f7 b7  jsr $b7f7  ;
      put the row in the .Y
      register
080f  84 d6     sty $d6    ;
      store the row in TBLX (currnt
      cursor line #)
0811  20 fd ae  jsr $aefd  ;
      scan past the second comma
0814  20 8a ad  jsr $ad8a  ;
      read column from BASIC line &
      put in accumulator #1
0817  20 f7 b7  jsr $b7f7  ;
      put the column in the .Y
      register
081a  84 d3     sty $d3    ;
      store the column in PNTR
      (current cursor column #)
081c  4c 10 e5  jmp $e510  ;
      set the cursor
```

The following short BASIC program will place this routine in a REM statement:

```
10 REMXXXXXXXXXXXXXXXXXXXXXXXXX
20 FOR X=2054 TO 2078
30 READ Y:POKE X,Y
40 NEXT X
1000
DATA 32,4,32,253,174,32,138,173,32
1100 DATA 247,183,132,211,76,16,229
```

Be sure 25 X's follow the REM in line 10. After typing the program in, run it
and delete all the lines except 10. Save this line to disk as a program and
simply load and use it as the first line of any program in which you want to
easily be able to position the cursor. The syntax is now simplified to:

```
ln#

YS 2054,row#,column#:PRINT'message'
```

where line# is any program line # greater than 10, row# is the desired cursor
row (0-24) and column# is the desired cursor column (0-39). As a brief example:

```
10 [line 10 created above]
20 PRINT"[clear screen]"
30 SYS 2054,12,18:PRINT"TEST"
```

This will print TEST in the middle of the screen. The above machine language
routines are all well documented in the literature except the routine at $b7f7.
This is an interesting little routine that has a host of useful applications.It

takes a floating point number in accumulator #1 and converts it to a 16 bit
positive integer. An error is printed if the number is not positive. The value
of the integer is returned in standard Lo Byte/Hi Byte format in three
locations:

Hex	Decimal	Label
$14/$15	20/21	LINNUM
$63/$62	99/98	FACHO(The first two bytes only of this location hold the signed result of a floating point to integer conversion)
.Y/.A	782/780	SYREG/SAREG

Since in the above application the numbers dealt with are always less than 40,
only the Lo Byte of the integer is of interest. All in all, kind of a neat
trick.
Happy Cursoring!!!!!!!!! Stephen R. Gast

HEXADECIMAL FILE DUMP UTILITY

by Robert W. Baker

Here's a handy utility program for looking at the contents of sequential data files on disk or tape, as well as program files on disk. It displays the hexadecimal value of each byte in the file so you can easily see the exact contents. Each display line also indicates the decimal offset from the start of the file so you have some idea where the data is located.

Although written for the C-64, if you make the indicated changes in line 180, the program will also work on the VIC-20. By changing the values of BC and CL, the display line will be changed to fit the VIC's 22 column dislplay. If you have a printer, you can get an optional printed copy of the data displayed.

Normally, each line displays 10 bytes and a 5 digit decimal offset. If you should try to dump a file with more than 99,999 bytes, only the five least significat digits of the decimal offset will be displayed. To fit the 22 column VIC-20 display, only five bytes per line can be displayed and the decimal offset is restricted to the three least significant digits.

When run, the program first asks if a printed copy is desired (11. 250-270). Answering 'Y' will cause any data displayed to be printed as well as displayed. Hitting RETURN alone enters a default response of 'N' so that data will be printed to the screen only. When using a non-Commodore printer you may have to modify the OPEN statement for the printer in line 390.

Next, the program askes where the file to be read resides: on tape or disk (lines 280-300). The appropriate tape or disk should be inserted in the drive before answering this question. When reading data from tape, the first file found on the tape will be used. This tape file must be a data file, not a program file.

If the file is on disk, the program asks for the name of the desired file (1. 320). The program assumes the selected disk file is a sequential data file and attempts to open the file (1. 330). If an error #64 (File Type Mismatch) is returned, the program will then assume the file is a program file

and attempt to open the file again (1. 340-80). Random access and user defined files cannot be read.

Once the proper file has been opened, the printer is opened if a printed copy was selected (1. 390). The file is then read byte by byte, with each byte being converted to hex and displayed (11. 420-470). At the end of each line the decimal offset from the start of the file is displayed at the beginning of the next line (11. 480-500).

After displaying each byte, a check is made for keyboard input to allow pausing the display or terminating the program before reaching the end of the file (11. 510-50). While data is being displayed, simply press any key except 'D' to pause the display. Once paused, press any key except 'D' to resume the display. Hitting 'D' at any time will terminate the program prior to reaching the end of the file.

When the end of the file is reached, the program will terminate automatically. If any disk or tape errors are encountered while reading the file, the program will terminate after indicating the error detected. Whenever the program terminates, all the files are closed properly.

```
120 rem                hex dump
140 rem         by: robert w. baker
180 bc=10:c1=5
182 rem change to bc=5:c1=3 for vic
190 h$="0123456789abcdef"
200 printchr$(147)"hex dump":gosub600
210 print"hit any key to "
212 print"hold/continue display"
220 print:print"hit 'd' when done -"
222 print"to stop before"
230 print"end of input file"
240 print:gosub600
250 input"want printed copy";c$
260 f=0:ifc$="y"thenf=1:goto280
270 ifc$<>"n"then630
280 input"file on disk or tape";d$
290 ifd$="t"thenopen1,1
292 f$="** tape file **":goto390
300 ifd$<>"d"then630
310 open15,8,15
320 input"filename";f$:iff$="."then630
330 open1,8,5,"0:"+f$+",s,r"
340 input#15,en,em$,et,es
342 ifen=0thenf$=f$+"(seq):goto390
350 ifen<>64then620
360 close1:open1,8,5,"0:"+f$+",p,r"
370 input#15,en,em$,et,es
375 ifen<>0then620
380 f$=f$+" (prg)"
390 if f then open 4,4
392 print#4,"hex dump of file: ";f$
400 printchr$(147)+"file: "f$
410 b=0:goto490
420 get#1,c$:ss=st:ifd$="d"thengosub610
430 ifss<>0then560
440 a=0:ifc$<>""thena=asc(c$)
450 n=int(a/16)
460 print mid$(h$,n+1,1);
462 mid$(h$,a-n*16+1,1);" ";
470 if f then print#4,mid$(h$,n+1,1);
472 mid$(h$,a-n*16+1,1);" ";
480 b=b+1:if int(b/bc)<>b/bc then 510
482 print
490 printri$("      "+str$(b),c1);": ";
500 if f then print#4
502 print#4,ri$("    "+str$(b),5);": ";
510 getc$:ifc$=""then420
520 ifc$="d" then 550
530 getc$:ifc$=""then530
540 ifc$<>"d" then 420
550 goto630
560 ifss<>64 then print "error..."
562 print"st = ";st:goto630
570 print:print:print" end of file"
580 iffthenprint#4:print#4
582 print#4,"end of file"
590 goto 630
600 print:print"--------------------"
602 print
610 input#15,en,em$,et,es
612 if en=0 then return
620 print:print"disk error..."
622 print en;em$,et;es
630 close1:close15:print
640 iffthenprint#4:close4
```

BASIC VARIABLE CROSS REFERENCE

This handy utility program produces a cross-reference list of every variable found in a BASIC program saved on disk. The program itself was designed to run on the C-128 in either 64 or 128 mode, as well as on the C-64 and older PET and CBM systems. It analyzes all programs written in BASIC 7.0 on the C-128, BASIC 2.0 on the C-64 or VIC-20, or BASIC 4.0 on the PET and CBM.

With the aid of a variable cross-reference list, you can easily control variable assignment and usage within programs being developed. It also makes debugging much easier, as every reference of a particular variable is clearly indicated. You can quickly spot variables reused within subroutines destroying previous values, and other common programming errors. It also makes it easier too, to investigate other people's programs.

The ouput generated by this program is normally printed but can be displayed on screen. Each variable is listed along with the line number of every line that references that variable. Long variable names are reduced to the standard two character name used internally by BASIC. Array variables are indicated by parathenses following the name. Individual array elements are ignored and references to particular elements cannot be indicated.

When you run this program, it first asks for the filename of the BASIC program stored on disk that is to be analyzed. Note that the program file is opened in read mode using the standard BASIC "OPEN" command in line 280. Newer BASIC 7.0 commands are purposly avoided to allow the program to run on a wide range of Commodore systems.

After opening the disk file, the program reads and discards the two-byte load address with the subroutine call at the end of line 290. Remember that the load address is returned as the first two bytes read as input from a program file when it is opened for reading.

The link and BASIC line number are then read, with the line number displayed and saved in LN$ for later reference (lines 300-320). The command at the end of line 310 converts the first character of the string formed in LN$ to a space instead of a cursor right. Whenever the STR$ function is used to convert a number to a string, the first character is always a cursor right for positive numbers.

Each BASIC program line is then scanned for variables while properly skipping data within quotes (lines 370-410), program data (lines 420-500), remarks (lines 510-530), and normal BASIC keywords. Special two-byte tokens used for keywords in BASIC 7.0 on the C-128 are skipped by lines 560-580. For general information, all two-byte tokens created by BASIC 7.0 start with a value of 206 or 254 ($CE or $FE hex). The byte immediately following these values indicates the exact token represented by the two byte code.

When a new symbol is found (lines 540-680) it's added to the current symbol table (SM$) in alphabetical order (lines 690-820). The line number where the variable is first referenced is saved in the LL$ matrix to start the cross reference listing. When a variable is found that already appears in the symbol table, the new line number reference is simply added to the end of the corresponding LL$ entry if that line number has not all ready been entered. Whenever any

entry in LL$ aproaches the maximum string length of 255 characters, another entry is made in both matrices for the same variable.
The current implementation of this utility will only list the individual lines that reference each variable. There is no indication as to how many times the variable may be referenced within each line, so be sure to look at the entire line in the analyzed program when using the cross reference list. If you really need to know multiple reference information, line 740 can be deleted. With his line omitted, every reference will be added to the LL$ entry. Therefore, the line number will be repeated three times if the variable is referenced three times on the same line. I would not use this mode too often, though, since it uses a great amount of memory for so little additional information.
As the program executes, the line number of the current line being analyzed is displayed so you can see how the program is progressing. Be patient, the program can take a while to analyze large programs or those that use a large number of variables. While on the subject, the program is currently limited to handling up to 500 variables as set by the dimensions of SM$ and LL$ in line 190. This seems to be a reasonable limit for most systems but you may run out of space if the program being analyzed contains an abnormally high variable usage. If you are running this program on a C-128 in 128 mode, you could safely raise this value.
Once the data is collected you're given the option of printing or displaying the formatted information. In either case, the first line of ouput indicates the filename of the program that was analyzed. The left column of subsequent lines indicated the variables contained in that program. The numbers following a specific variable name indicate every program line that references that variable. If enough references were found to fill more than one line, the variable name will only appear on the first line shown.
While the output is being displayed or printed, pressing any key on the keyboard will suspend the output. This is especially convenient when using the screen display. When ready to continue, simply press another key on the keyboard and the output will resume. If you press the 'Q' key when the output is suspended, you can terminate the program.
Screen displays are formatted for 40 column lines while printer ouput is formatted for 80 column lines. If you want to run this program on a C-128 with an 80 column display in 128 mode, then change the first value of RM from 25 to 65 in line 900. If your printer has more or less than 80 characters per line, then change the value of RM at the end of line 900 to 15 less than the maximum printer line length. If you need to do anything special for your printer, you can add lines before or after the OPEN in line 880.
One final note, if any errors are detected while reading the program file form disk, the error information returned from the disk will be displayed and the program will terminate with all files properly closed.

For those that don't like to type or would like a copy of the program right away, send $5 to cover costs and I'll send a copy of the program on disk. **Robert Baker.**

```
120 rem        basic program
130 rem  variable cross reference
140 rem
150 rem   by robert w. baker
180 :
190 dimsm$(500),11$(500):sm=0:sp$=chr$(160)
192 printchr$(147);
200 printspc(13);"basic program"
210 print"   variable cross references"
220 print"prints or displays a cross reference"
230 print"table of all variable used within any"
240 print"basic program saved on disk.";chr$(17)
250 print"----------------------------";chr$(17)
260 print"name of basic program on disk:"
270 printchr$(29);chr$(29);chr$(29);sp$;
272 printchr$(157);chr$(157);chr$(157);:inputf1$
275 if f1$=sp$thenend
280 close15:open15,8,15:open5,8,5,"0:"+f1$+",p,r"
282 gosub1170
290 printchr$(17)"ok, scanning program file"
292 printchr$(17)"at line:";:gosub1140
300 gosub 1140:ifv+v1=0then830
310 gosub 1140:ln=v1+(256*v):ln$=" "+mid$(str$(ln),2)
320 printtab(10);ln$;"          ":printchr$(145);
330 rem scan basic line for symbols
340 gosub 1150
350 ifv=0then300
360 ifv<>34then410
370 rem quote--skip chrs till next
372 rem quote or line end
380 gosub1150:ifv=34then340
390 ifv>0then380
400 goto300
410 ifv<>131then500
420 rem data token--skip charactors
422 rem till colon or line end
430 gosub1150:ifv=58then340
440 ifv=0then300
450 ifv<>34then430
460 rem if quote found--skip till
462 rem next quote or line end
470 gosub 1150:ifv=34then430
480 ifv>0then470
490 goto300
500 ifv<>143then550
510 rem rem token-skip chrs to line end
520 gosub1150:ifv>0then520
530 goto300
540 rem check for valid symbol
550 ifv<>206andv<>254then590
560 rem skip 2-byte tokens of basic 7.0
```

```
570 gosub1150:ifv=0then300
580 goto340
590 ifv<65orv>90then340
600 s$=c$:gosub1150
610 ifv<48orv>90then670
620 ifv>57andv<65then670
630 s$=s$+c$
640 gosub1150
650 ifv<48orv>90then670
660 ifv<58orv>64then640
670 ifv=36orv=37thengosub1130
680 ifv=40thens$=s$+"()":gosub1150
690 rem save in alpha order
692 rem with line ref
700 s$=s$+" "
710 z=sm:ifsm=0then810
720 forx=0tosm
730 ifs$<>sm$(x)then780
740 ifright$(l1$(x),len(ln$))=ln$then770
750 iflen(l1$(x))>246thensm$(x)=left$(sm$(x),len(sm$(x))-1)+chr$(1)
752 goto780
760 l1$(x)=l1$(x)+ln$
770 x=sm:nextx:goto350
780 ifs$>sm$(x)thennextx:goto810
790 z=x:fory=smtozstep-1
800 sm$(y+1)=sm$(y):l1$(y+1)=l1$(y):l1$(y)="":nexty
810 sm$(z)=s$:l1$(z)=l1$(z)+ln$
820 sm=sm+1:goto350
830 close5:close15
840 print:pd=3:print"done, want printed output (y/n): ";
850 getc$:ifc$="n"then880
860 ifc$<>"y"then850
870 pd=4:gosub1220
880 open4,pd
890 rem print symbol table in order
900 gosub1200:rm=25:ifpd=4thenrm=65
910 forx=0tosm
920 ifpd=3then940
930 ifpg=56thenfory=1to10:print#4:nexty:gosub1210
940 iflen(sm$(x))=0then1100
950 s$=left$(sm$(x),len(sm$(x))-1)
960 print#4,"   ";left$(s$+"     ",5);
970 b=0:fory=0toint(len(l1$(x))/rm)
980 a=b+1:b=a+rm:ifb>255then1010
990 c$=mid$(l1$(x),b,1):ifc$=""then1010
1000 c=asc(c$):ifc>47andc<58thenb=b+1:goto990:rem break line at space
1010 ln$=mid$(l1$(x),a,b-a):ifln$=""then1040
1020 ify>0thenprint#4,"         ";
1030 print#4,ln$:p=pg+1
1040 nexty
1050 getc$:ifc$=""then1100
1060 ifpd=4thengosub1240
```

```
1070 getc$:ifc$=""then1070
1080 ifc$="q"then1110
1090 ifpd=4thengosub1220
1100 next x
1110 close4:end
1120 rem subroutines
1130 s$=s$+c$:goto1150
1140 gosub1150:v1=v
1150 get#5,c$:gosub1170:ifc$=""thenv=0:return
1160 v=asc(c$):return
1170 input#15,en,em$,et,es:ifen=0thenreturn
1180 print:printchr$(18)"disk error"chr$(146)enchr$(18)"   trk/sec:";
1185 printchr$(146)et"/"es:printem$
1190 close4:close5:close15:end
1200 ifpd=3thenprintchr$(147);
1210 print#4,"variables in: ";chr$(34);f1$chr$(34):print#4:pg=2:return
1212 printf1$chr$(34):print#4:pg=2:return
1220 printchr$(147)"printing cross reference table"chr$(17)chr$(17)
1230 print"press any key to suspend output":return
1240 printchr$(17)chr$(17)"output suspended"chr$(17)chr$(17)
1250 printchr$(18)"press any key to";
1260 print"continue, q to quit"chr$(146):return
```


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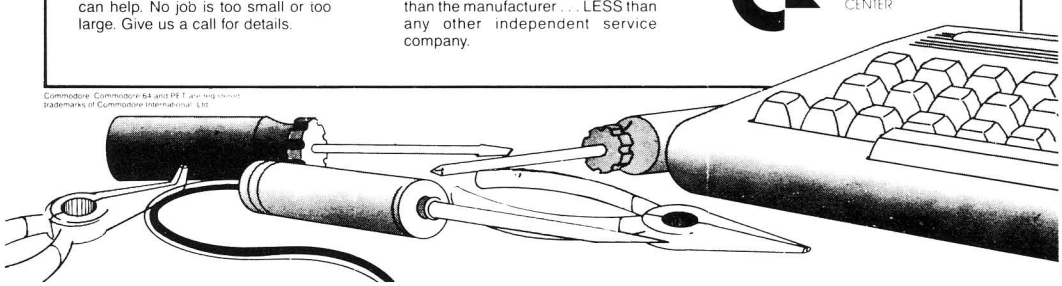

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