

# THE MONITOR

## President's Report

First of all, I would like to thank Shawn Schafer for his presentation on the Internet and what it would take to get on with our beloved 64s and 128s. Our coffee experiment went well at the last meeting and I hope it will be a continued success. Congratulations to Dave Coleman. He was the big winner at the last club meeting. Not only did he win the draw from the 'software box', but he also picked up the CUGS coffee mug. He must think it's a conspiracy to keep him coming back. Harvey Klyne has graciously offered to give us a demonstration on keyboard cleaning this month.

Our ad in the Western Producer is starting to produce some results. Six possible new members have called in the first week to express interest and I have sent them a little information kit telling them about our club

as well as a demo disk from our club libraries.

It was decided at our last general meeting that we should have a SIG for new beginner members, helping them with the A's to Z's of Commodore computing. It was also discussed that it would be appreciated that when club members purchase disks from the libraries that maybe if something catches your interest, that you might want to share your experience with the rest of us by writing a review for the Monitor. That way the entire club could benefit from it. If the article is published, for your trouble, you will receive a free disk from the libraries.

Hope you enjoy this month's Monitor. It is Stan Mustatia's turn to produce and edit it. I hope you like the new look. See you next month.

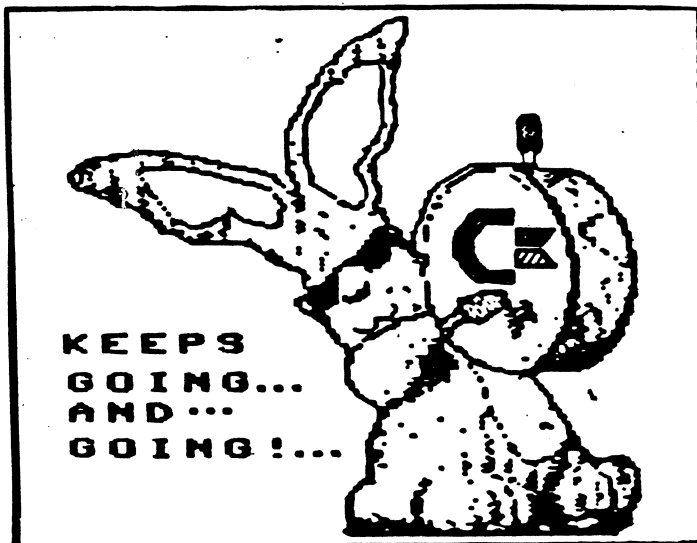
## CUGS EXECUTIVE

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CUGS is a nonprofit organization comprised of Commodore users interested in sharing ideas, programs, knowledge, problems and solutions with each other. Membership dues (\$15) are pro-rated, based on a January to December year.

Anyone interested in computing is welcome to attend any meeting. They are held on the first Wednesday of every month at Miller High School, from 7:30 P.M. to 9:30 P.M. The next meeting will be held on April 3, 1996.

Members are encouraged to submit domain and shareware software for inclusion in the CUGS Disk Library. The programs are compiled onto disk volumes, which are made available to club members for a very reasonable price. Since some programs are from magazines, individual members are responsible for deleting any program that they are not entitled to by law. To the best of our knowledge all programs are identified in their listings.



By Judi Zentner &  
Drew Ruether

This month's newsletters are from Mahoning Valley Computer Club of Youngstown, Ohio. Their monthly newsletter is called the Computer Connection. Not only did they send their newsletter, but they also used one of our articles from a previous Monitor. The article they used was about making labels for UHS videos. Also, W.C.C.U.G., the Western Colorado Commodore Users Group of Mack, Colorado had an honorable mention of C.U.G.S. in their monthly newsletter. These and all other newsletters we receive every month are available for viewing at all club meetings. They can be taken home to view at your leisure. Just see me after the meeting to make arrangements.

This month's articles come from several different sources. A very interesting article from CMD regarding the Super 64 CPU 10mhz and 20mhz. I thought it may be of interest to all. For all you tinkers out there, we have an article on installation of external device switches for the front of your 1280s. This article comes from MPC Club Monthly, The Commodore Helpers, of Long Beach, California. See you all next month.

P.S. : I have included a list of some hardware, software, magazine suppliers that I received the other day in the mail. I hope They help.

## Programming Commodore Graphics #3

Well I can tell you that after that last cold snap we had, I nearly gave myself a hernia shoveling up all those little brass orbs I found in my yard. Man was it cold . . . (HOW COLD WAS IT ?) It was so cold I saw a polar bear wearing electric socks. Ha Ha. Now that the corn is out of my system, lets pop some and settle down to some work. I know it's a four letter word that ranks right up there with cold, but here we go .

If you have your disk with last months program handy, put in your drive and type "LOAD "FILENAME",8 where FILENAME is the name under which you last saved this file. Make sure to use the comma ,8 extension.

Next type LIST 20. Cursor up to the point where you see C=0. Place the cursor on the 0 and type a 3. Press return to record this.

Change in your program. Move the cursor down the screen until you have a clean line to type on, then type RUN. If all went well, you should see the something that you saw before, but only in a different colour, cyan or a greenish blue .

Now we are going to add a new line to your program. Cursor down your screen about halfway, or until you have a clear line to type on and type this new line exactly as shown.

```
45 C=INT(RND*(1+16)):IF C=1
THEN 45 <RETURN>
```

Next clear your screen and type LIST. If you have done the above correctly, you should see a new line between lines 40 and 50. The one you just typed, number 45.

(Incidentally it is always a good idea when programming in basic to number your lines in units of ten or something close to it just so you can do what we have just done. If we hadn't done this we would have had to type in the whole program again just to add this one line).

Line 45 looks a little complicated and it does contain some unfamiliar commands, so we will have a little closer look at it now. You will remember that the variable C is the one we have been using to define the colour of the characters as they are displayed on the screen. The statement (RND\*(1+16)) looks strange but to put it simply all we are telling the computer to do is pick a number between 1 and 16. Not difficult. However, we also preceded the RND statement with an INT. This means integer or whole number if you will we to include this because of the way that the computer calculates the random number. Suffice it say that your computer will generate a *pseudo-random* number between 0 and 15.99999999, by preceding the RND with INT. The computer will drop anything after the decimal place, so we end up with a value for C that ranges from 0 to 15, the numbers for the colour codes in the Commodore.

The statement after the colon (which by the way can be used to separate multiple statements on the same line) simply looks to see if the new value for C is equal to one. If it is, then the line simply returns to its self and generates a new number. If C does not equal to one, the program goes on to the next line. The reason for doing this is that your screen should be coloured 1. If the value

of C were equal to one, you would not be able to see it against the back ground. You will see what I mean in one second. If you have not already done so, cursor to a clear line on screen and type RUN. You should see the same familiar characters at the top of the screen, only this time they should be multi coloured.

And now the moment we have all been waiting for, **MAKING THINGS MOVE**. Okay clear the screen and get ready to type another new line. Remember type exactly as shown and press return after your done typing.

```
65 GET A$:IF A$="" THEN 65
```

There must be no space between the "" marks.

Okay the A\$ tells the computer to scan its keyboard to see if a key has been pressed (any key) and assign the value of the key pressed to the variable A. The rest of the line simply states that if no key has been pressed, "" execute line 65 again and continue to do so until one has been pressed.

Find a clear line and type run SURPRISE! Nothing appears to be happening. Okay, I should have warned you. By now you probably pretty good at typing in these single lines and probably didn't make any mistakes in your typing, so press down on the space bar and hold it down. This key (bar) is one of the few keys that automatically repeat. The others being the CURSOR keys and the INST/DEL keys being the others. (This can be changed however by POKEing address 658.)

Did you see it move across the screen. If you did your typing right, you did. If not, try again. If you did, bring the program to a halt by pressing the RUN/STOP

key and you should see BREAK IN 65. This means that you interrupted the program as it was executing line 65.

Next we will get rid of line 45. We don't need it any more, but were not going list it then erase it by using the INST/DEL key or by typing over it with spaces. Just do this. Cursor down to a blank line and type 45 <RET>. If you list your program now by typing list, you will see line 45 is no longer there. For future reference, when you type a new line that has the same number as an existing line, the old is automatically replaced with the new. So when you typed 45 followed by a line of nothing, the computer replaced the old line 45 with a line of nothing. Then the computer noticed *That nothing from nothing leaves nothing* and since there was nothing on the line, the computer threw out the line and its number.

Now for a little more fun. First list the program to ensure that line 45 is indeed gone. Now edit line 60 so that it looks like this ...

```
60 POKE VA+A,1
```

Next we will add a new line that appears as follows ...

```
67 POKE VA+A,32
```

Run the program again. Hold down the space bar, and you should see a little blue A Running along the screen. Line 60 POKEs video memory with 1 (*the code for an A*). Line 65 stops the program till you press a key, as before. Then line 67 POKEs video memory with 32, a blank space (*32 is the asii code for a space*), which wipes out the blue A and lets the background colour (white) show through again. The process repeats over and over, in successive video addresses, and it happens enough so that the symbol seems to move. This is how we

animate images in simple video games - as you will see, when we write our first game in the next installment of **GRAPHICS ON THE COMMODORE**.

If you managed to remember everything we discussed in the previous articles, you have a better memory than I. So for those of us who couldn't remember where we left our heads if they weren't screwed on tightly, what follows is a little review or some things you should know by now.

- \* How to set screen background and border colour by POKEing a colour code (0 through 15) into 53281 and 53280.

- \* How a POKE statement works, putting a number into memory address like mail into a mailbox.

- \* How to type instructions in immediate mode (without line numbers) or a program (with line numbers).

- \* How to display characters on the screen by POKEing their ASCII codes into video addresses, and POKEing corresponding addresses in colour memory.

- \* How to clear the screen, move the cursor, and edit program lines (remember, press RETURN after editing each line, to update the computer's record of the program, which isn't necessarily the same as what you see on the screen).

- \* How to delete, insert, and replace whole program lines.

- \* How to save a program.

- \* How to GET a character from the keyboard.

- \* How to move an image from on pixel to the next across the screen.

## CUGS DISK PRICES

There is a new price structure for purchasing club disks:

Disks from the what is considered the old club library end use a letter cataloging system. They are sold at 5 disks for \$5 and 5 blank replacement disks.

Disks that use two numbers as the last digits in the LD., are considered to be part of the new library. They are sold at 1 for \$1, plus one replacement disk.

Both libraries contain a wealth of great programs. They are all backed by the CUGS guarantee. If for any reason the disks you purchase are faulty, a new disk will be exchanged.

## Here's looking At You

**Name:** Rob Gilchrist      **Age:** 32  
**Occupation:** Semi Retired  
**Phone:** 352-2428  
**Equipment:** C128, 1004S monitor, C64, Star MX10000 printer, 1541, 1571, Turbo Load & Save cartridge  
**Latest Project:** C64 Library  
**Commodore Wish List:**  
 Little Broun Box, Printshop, Geos 64 VR8, Modem, REU with battery back-up  
**General interest beyond CUGS:**  
 Computers in general  
**Expertise:** Geos 64

**Name:** Keith Kasha      **Age:** 32  
**Occupation:** Semi Retired  
**Equipment:** Vic-20, C64, C128, 2-1571, MSD R232 interface, Supra 2400 modem, Panasonic Printer, 1750 REU, 1551 mouse, Geo-cable, MI-050  
**Favorite software:** Word processing - Paperclip III, Geowrite128  
**Commodore wish list:**  
 Complete Geos Line- Ramlink, Hard drive, 3 1/2" drive  
**Interests outside CUGS:**  
 Star Trek, Broadcasting, Creative Writing, Christian children  
**Expertise:** Geos 64/128, Paperclip III, Sim City, CP/M

**By:** Mike Egglestone (M.I.C.E.)

The topic for today is the C128D and the installation of external 8, 9, 10, and 11 device switches on the front panel of the unit.

Before we get started, let me give you some advice. If you cannot make small connections, in tight areas on a circuit board, this is not a modification you want to attempt. Get someone else to do it for you.

You 128D owners know that the built in 1571 drive answers to device 8 at power up. Up to now, you had to "Software Switch" the device number to use any other drive you might have available for device 8.

Those days are gone folks. Here is the procedure for installing external device switches on the front panel of the case.

- Parts required for this job:**
- \* 25 watt soldering pencil
  - \* High grade electric solder (fine)
  - \* Two, micro mini switches SPST (on/off) (Radio Shack)
  - \* Approximately 30 inches of very fine stranded wire
  - \* A drill and drill bit to install the switches.

First, remove the case cover from the main unit. Three screws in the back and two muller ones on the bottom front of each side. Slide the case cover back about 1/2 inch, and pull the front straight up. The cover will turn loose of the bottom with ease.

Next, remove the built in 1571 drive unit. Do not let this throw you. It is very simple and easy to do. Disconnect the rear (read/write) head connection, then unplug the three power plugs. Hint: Note the color of the wire on the front of each plug. This will help you relocate them in the proper position when it comes time to plug them back in. It is darn near idiot proof, but I have screwed them up myself.

Remove the screws on the side of the drive. Some have 3 and some have 4. Pull off the latch lever from the front, and slide the unit out of the mount. Set it aside for now.

Under the drive, front facing rear,

on the left hand side, you will see a chip called 65c22 or 6898371923. This is the device number control unit, among other things. Directly behind this chip you will see a Crystal Can. It is a metal can with a piece of wire wrapped around it that is soldered to the circuit board. Keep this can in mind. We will use it later. On the left rear side of the 64c22 chip, you will notice two small silver dots, just to the left of the 4th and 5th pin (counting from rear to front).

These small silver dots are on the circuit board, and are really two half moon shaped dots with a very connection between the half moon sections. Look very close (use a magnifying glass if necessary). These are the pads we will be working with when we add the device number switches.

Take a very sharp exacto knife, or razor blade, and scrape the small trace between the pads off the circuit board. The drive will now answer as device 11. Both circuits are now open, and the device number is 11. These pads are nothing more than circuit grounding points. The side closest to the chip is the switch side, and the other side is a circuit ground. The trace in the middle makes the connection.

The next step is to install a wire to the chip side pad half.

Using very fine stranded wire, about 18 inches long, strip back about 1/4 inch plastic coating. Using the soldering pencil, pre-tin the wire. When the wire has cooled, bend the pre-tin end to a 90 degree angle in the middle of the tinned area. This will give you 1/8 inch up and 1/8 inch on a 90 degree angle. Do not try to place solder directly onto the circuit board pad. Use the solder on your pre-tinned wire only. Using care, position the 90 degree angle on top of the pad, and apply heat to the wire with the soldering pencil, while pressing down. When the solder flows, remove the heat and hold the wire steady until the solder cools. Do exactly the same to the other pad. You may drill a very small hole in the pad half and insert the wire 1/8 inch into the hole and then solder the

connection, but it is not necessary if you are careful. This is not a structural connection, and care must be taken always. If you mess up, and overheat the small pad half, it will separate from the circuit board and come off. If this happens, then the pins on the chip itself must be used, and they are on the opposite side of the chip. Starting from the rear and counting forward, pins 5 and 6 on the right side can be used. Check them with a UOM first to be sure.

All right, let's assume you made it. You have the two wires attached properly to the pads. Next, you remove the front plastic panel on the case, three screws at the top, spaced evenly across. Tilt the panel slightly forward, and up and out.

Drill two holes just left of the

drive activity light, and slightly lower. Watch your clearance between the switches, but mount them side by side with minimum spacing between them. The switches should be mounted so up is on and down is off.

Using the large hole to the left of the drive mount, feed both your wires through and out the front. Solder the front pad wire to the upper connection on the left switch, and the rear pad wire to the upper connection on the right switch. Using the third 18 inch piece of wire, bridge the lower connections between the switches. This is your circuit ground and is common to both switches.

Next, feed your wire back through the large hole, and solder the other end to the CAM mounting strap. Remember I told you to keep this

can in mind. It is the perfect circuit ground point.

OK, that is the end of the job. Re-install the front panel and drive unit. You may test this setup with the case cover removed. It will work out like this. Both switches up is drive 8. Left switch down, device 9, left up, right down, device 10, both down, device 11. Just do not forget that you must reset the drive or the computer after each switch change.

The drive has a separate reset switch right next to the computer reset switch on the right hand side towards the rear. I opened the hole for this drive reset switch, and put a plastic extension on the button. Those little vacuum caps that are sold in most automotive stores make perfect extensions for the reset switches.

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## Clark County Club Disk Review

This month's review is from Clark County, Las Vegas Nevada their July of 1995 issue. To load their menu system simply type `LOAD "0:*",8,1`. To move around in the menu use the cursor keys. When you come to something that may be of interest, simply press `<RETURN>` and the file will be loaded and run for you. When in any of the articles, pressing the up arrow key or the pound sign (both located in the upper right quadrant of your key board) will return you to the main menu. Pressing the + or - key will move you one page forward or back in any article.

Each of the disks received so far contain a list of topics in the main menu some with sub menus attached. The headings are as follows:

What's New *The table of contents*  
Featured Articles *The cover story*  
Members want ADS *Who wants*

### *What*

Info on group *Who's who's*  
Programs on disk *Instructions for running the programs included on the disk*  
Commercial Advertisement  
Pricing *policy for advertisements*

### Monthly Features:

BBS list  
Editors page  
4 Beginners only  
Writers tips  
Contributors  
Back issues  
Other side  
Help/Instructions

FEATURED ARTICLES for  
June of 1995

Buzz Words  
by Brain Heyboer

This is a short list of some confusing computer terms commonly heard, followed by short definitions for each one.

### 18 X

Some helpful hints for Gemini 18 X printers

### 64 Memory management

A brief explanation of cartridge interfacing and Commodore 64

### 51 Things

Fifty-one things to say when people ask why you own a computer  
*example:*  
Why do you own a computer?  
Stupid earthling!  
or  
Did you ever see War Games?

### Donations

A list of items, programs etc... that are available to club members for their use and/or edification.

### Programs on Disk:

#### Wizard Tag

A simple arcade game, use a joystick in port two, collect keys and heads. The first few levels are even easy enough for small

kids.

#### Pi

This animated program shows four different ways to calculate the value for Pi.

#### Basic Quiz

This program is designed to help beginning programmers with some *Basic 2.0* commands in the form of a quiz.

#### Clue

A graphic board game that is basically the same as its name sake with on a few variations.

#### Dis Err Check

Allows the user to check a whole disk or certain sections of a disk for read/write integrity.

#### 4 beginners only

Some disk commands with examples such as:  
how to format a disk, get a disk directory, how to print a disk directory.

#### Otherside

A sid writing program for the music buff.

## Uncle Cugsy's

## Tips & Trix

By: Drew Ruether

- 1) It's Not Dead Yet!! - A common problem with the C64 is the fuse inside the computer. If the power light comes on, but you have a blank screen, suspect the fuse. It is usually blown by misinsertion of devices into computer.
- 2) Slow Scroll Directory - To slow scroll the directory on the 128, type:  
ESC A  
F3 (LIST DIRECTORY)  
ESC C (CANCEL COMMAND)
- 3) Program Recovery - When a program hangs up on the 128, hold down the STOP key while pushing the RESET button. This puts into ML MONITOR. To exit, press the X key and then the RETURN key. You can now

list the program, save it to disk, or rerun the program again.

- 4) Two Column Directory Compare (128 only) Press F3 to list directory. Press HOME once, the TAB key five times and then ESC T. Press F3 to list the second directory.

We need help filling this column!! If you have any tips or tricks for the 64/128, please give them to Stan or myself and we'll see that they find a good home in the column.

## A Short Editorial

By: Stan Mustatia

As you all probably noticed, the Monitor looks quite a bit different this month. For the past few years our club newsletter has been produced by Tristan Miller. I would like to take this time to thank Tristan for the superb job that he has done. Unfortunately, Tristan has not been able to continue his role of editor, because of school commitments. I have volunteered to give it a fling. I don't hope to get the same results as before, but I will try not to disappoint anyone.

Tristan was publishing the

Monitor using a IBM clone because of lack of proper Commodore equipment. Before Tristan was the editor, the newsletter was done on a Commodore, with GeoPublish. I would like to go back to doing it this way.

This is of course my first effort, so bear with me for now. I promise to improve on the Monitor as I get more familiar with the publishing program. I may stumble a few times, and have to start over, but I will get the newsletter out each month. Each time out, I will try to add some new feature that shows off the capabilities of this fine computer.

At this time, I am actually looking for names. I would like to

know of any expertise in any given program that you might have. I'm not saying that you should know the program inside and out. As long as you feel comfortable using it, that could qualify you as a expert. I am looking for anyone with any skills in a wide variety of programs, such as, word processing, graphics, Geos, music, programming languages, CP/M, technical support, databases, spreadsheets, communication, etc. Just let me know what programs you have experience using, and if you don't mind, I will put your name on the list. The list will appear in future issues of the Monitor once I gather up a few names. Don't be shy, give it a try.

SOME SOURCES FOR COMMODORE SOFTWARE/HARDWARE/INFO

BUSY BEE SOFTWARE, PO Box 206, St David, AZ 85630. Phone (520) 720-4103. The Write Stuff (TWS) word processors for C64 and C128. Talking version available for C64. Easy for the beginner, yet packed with features for advanced users. Versions available for CMD devices, parallel printer output (ie: GeoCable). I *love* this word processor.

CREATIVE MICRO DESIGNS (CMD), PO Box 646, E Longmeadow MA 01028. ORDERS: (800) 638-3263. INFO: (413) 525-0023. Hard drives, 3.5" drives, RAMLink, GEOS, much more.

SOFTWARE SUPPORT INTERNATIONAL (SSI), 2700 NE Andressen Rd, Suite A-10, Vancouver WA 98661. ORDERS: (800) 356-1179. SUPPORT: (206) 695-1393. Software, interfaces, etc.

COMMODORE COUNTRY, 1420 County Road 914, Burleson TX 76028. ORDERS (800) 676-6447. INFO (817) 295-7658. Hardware, software, repairs.

JOHN ELLIOT, 35 Crestview Ave, Daly City, CA 94015. (415) 756-9810. RESET SWITCHES that plug into the User Port of a C64. \$10 (post paid).

ABU TAJJ PUBLICATIONS: The ATP MUSIC RITER for creating music manuscripts with FGM. Chauncey Westbrook, (215) 843-0118. See page 81 of FGM your manual.

THE FGM CONNECTION (of course:): PO Box 2206, Roseburg OR 97470. INFO/HELP: (503) 496-2243. Source for FGM and related products.

V-TECH INC, 2223 Rebecca, Hatfield PA 19440. (215) 822-2989. Ribbons and inks, many colors, good prices. Ink jet refills.

TECH STAR SERVICE CENTER: (206) 251-9040. Hardware, repairs, good service.

SOFTWARE HUT: (610) 586-5701. Hardware and software.

TYCOM INC: (413) 442-9771. Hardware and repairs.

KASARA MICRO SYSTEMS: (803) 681-5511. Parts and chips.

MAD MAN SOFTWARE: (307) 632-1178. Backup and compression utilities.

CREATIVE DATA PRODUCTS INC., (408) 448-3773, X125. If you order disks in quantity this is a good source for quality disks at great prices.

PAPER MAGAZINES:

COMMODORE WORLD (Published by CREATIVE MICRO DESIGNS - CMD, see above). A fairly new entry, and a high quality magazine.

THE UNDERGROUND: 4574 Via Santa Maria, Santa Maria, CA 93455. A "Mini-Mag", packed with useful info. Leans toward the technical. Companion disk available.

DISK MAGAZINES:

LOADSTAR: ORDERS (800) 831-2694. SUPPORT (318) 221-8718. This is THE Commodore disk magazine. Info, puzzles, games, tutorials, much more. Call the 800 number and ask for a free issue (assuming offer is still valid).

COMMODORE CEE (previously CEE-64 ALIVE!): PO Box 232115, Sacramento CA 95823. PHONE: (916) 395-9773. A disk magazine on multiple disks, packed with useful info & programs from around the world.

Dear FGM User,

America Online (AOL) has finally struck the deathblow to that from which it sprang: October 31st 1994 was the last day of operation for Q-LINK. Q-LINK had been deteriorating over the previous two years due to AOL's inability(?) to maintain the Q-LINK system, with no new uploads posted since January 1993. Or, from AOL president Steve Case's letter: "The dwindling number of software vendors supporting your computer have made it impossible for us to maintain Q-Link as a high quality product". Since Q-Link wasn't relying on software vendors, that excuse sounds kinda lame to me. Anyway... AOL would like you to switch to their mainline service, after you run out and buy a MAC or IBM compatible (you can't use your Commodore on AOL). Fortunately, there are other major online services that still support our machines. The following services have good-size Commodore areas, and also provide Internet access. I really don't know which one to recommend, but you aren't marrying them; you can try them all.

COMPUSERVE (1-800-848-8990 voice)

DELPHI (1-800-695-4005 voice)

GENIE (1-800-638-9636 voice): The *Commodore Flagship* area appears quite active. An FGM area will likely be set up on this service as soon as GE figures out that there are computers in Roseburg and gets an access line into here.

THE INTERNET: For this you'll have to locate a service that can connect you. Many commercial servers are becoming available (even Roseburg has a few!), and the rates are generally very reasonable (our server is \$10/mo for nearly unlimited access). Many libraries and institutions of higher learning have numbers that allow you to access INTERNET through them (often free, but usually limited access). The above online services provide INTERNET access and email, though you must pay connect time.

The FGM email address on the Internet is "fgm@gears.efn.org". There are some very active Commodore message boards and WWW sites on the net.

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Ron's newest recommendation for printers; the Canon BJ-200e Bubble Jet. Works great with the C=64 and any interface. It's small, fast, quiet, and has great output. This printer has 64 nozzles which are used in varying combinations for 24-pin and 8-pin emulation (48-nozzle output is possible if you program or have a mega-buck computer). Has Epson and IBM Proprinter 24-pin emulations, as well as Canon's own native mode. Text is outstanding, and this printer has the best "8-pin" graphics output that I've ever seen (the printer uses more nozzles at lower densities so the dots always connect with no space between). The printer can be found for around \$200 (under \$200 for refurbished BJ-200's).

Possible negatives are: 1) Uses single sheets (in a paper tray); you can't use with tractor feed. 2) The User Manual contains NO control codes; if you need these you'll need to order the Programmer's Manual from Canon for about \$25. 3) The ink doesn't like to get wet. 4) The ink cartridges are a little pricey, BUT you can get refill kits from V-TECH and other sources, and the process is very easy.

If using a BJ-200(e) (or other 24 pin printer) with FGM then use one of the following setups:

1. Use EPSON emulation and select Epson (crt) for a driver. Printouts will be 17% taller than an 8-pin printer, but offers the most density selections.

2. Use IBM Proprinter emulation and select Epson (non crt) for a driver. Printouts will be same height as an 8-pin printer. Only densities of 60, 120, and 240 are available. To get 80 dpi print at 240 dpi 3x width.

NOTE: EPSON brand 24-pin and ink jet printers do not have IBM Proprinter emulation, hence they will not work well with most Commodore programs; output will be stretched vertically by 17%.



and can accommodate from 1 to 16 Megabytes of Dynamic RAM (DRAM). The RAM on this card can be used as either data or program storage. In addition, some or all of this RAM can be configured for use as an ultra-high-speed RAM disk drive similar to that of RAMLink. The most exciting aspect of this option will be that programmers can write software that greatly exceeds the limitations associated with the current 64K of internal computer memory found in the C-64. This gives software developers enough room to create sophisticated new applications with features and capabilities never before possible on the Commodore 64!

### Developer Support

CMD is actively seeking companies willing to create new commercial software and/or modify existing software to take full advantage of the SuperCPU. A comprehensive developers package is being assembled for programmers interested in using the new capabilities of the SuperCPU. This package will include an assembler which supports all 65C816 opcodes and addressing modes as well as all pertinent technical specifications and guidelines. This package will enable developers to produce programs which take advantage of the 65C816's enhanced instruction set, 16MB addressing capability and additional RAM available on the optional RAM Expansion Card.

### 128-Mode Compatible Version?

This is up to you—the C128 user! We have not officially decided on whether or not we will be designing a version of the SuperCPU that will accelerate the 128-mode. The decision to pursue this version will be made based on the number of inquiries from the C128 community. If you are at all interested in a C128 version of the SuperCPU, we request that you mail us a postcard or letter stating that you would be interested in purchasing one if we were to develop it. If we do not receive a favorable response to this request, a C128 version will not be developed, so take a moment and drop us a note let us know you are interested!

(Please Detach Here)

## Advanced Order Deposit Form

CMD is now accepting advanced orders for the Super64 CPU accelerators. By forwarding an advanced deposit of \$50.00 or more, you will be assured to receive one of the units from our first production run which is scheduled for February '96. This deposit shall be fully refundable prior to shipment and will be deducted from the final price of the unit. Projected Pricing: \$149.00 for the 10 Mhz model and \$199.00 for the 20 Mhz model. By placing an advanced order, you will be guaranteed that the price for your accelerator will not exceed our price projection. The remaining balance will be charged to your credit card as soon as your unit is ready. Deposits that are being made by check or money order must also state the method by which the remaining balance is to be paid and a phone number must be provided to insure prompt processing of your order at time of shipment. For additional info please call customer service between 10 AM and 4 PM EST.

**NEW  
for '96**

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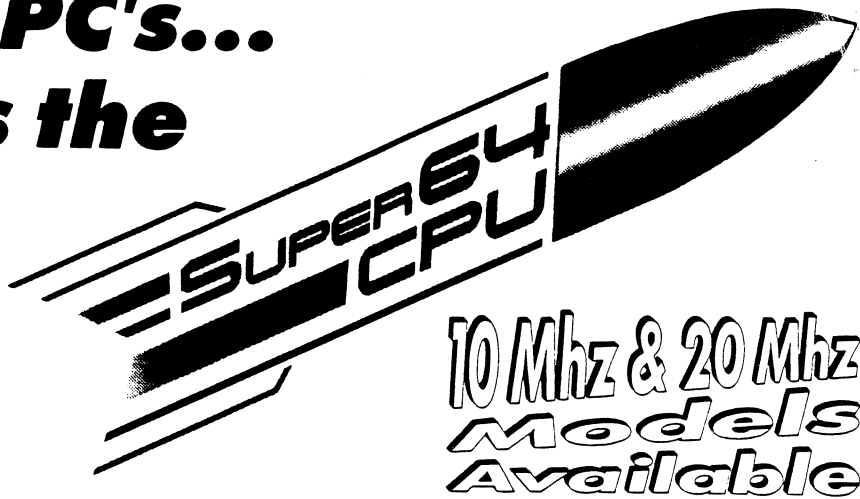


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# Move Over PC's... Here Comes the Future of Commodore Computing



10 Mhz & 20 Mhz  
Models  
Available

\* This version of the SuperCPU is designed for operation in the 64 mode only

## What is the Super64 CPU?

The Super 64 CPU is an accelerator module that plugs into the C64/128 cartridge port. At its heart is the W65C816S microprocessor running at either 10 or 20 MHz, along with 128K Bytes of high-speed Static RAM (the same type of high-speed cache memory found in 486/Pentium systems), 64K Bytes of ROM, and a Complex Programmable Logic Device IC (CPLD).

The SuperCPU is contained within an enclosure approx. 6" wide x 3" tall x 2" deep. The enclosure has an opening for the Cartridge-Port Pass Thru connector at the rear, precisely in line with the computer's Cartridge Port. The unit is approximately the same width as a RAMLink or REU. The main circuit board in the SuperCPU mounts vertically, so as to keep the depth of the unit to a minimum. This prevents devices plugged into the pass-thru port on the CPU from extending too far back from the computer. Three easy-to-use toggle switches line the upper front edge of the unit: A Unit Enable/Disable switch; a JiffyDOS Enable/Disable switch; and a speed selection switch.

## Installation

Installing the SuperCPU is simple: just plug it into the Cartridge port. No wiring or jumpers need to be installed inside of the computer.

## Operation

Operating the SuperCPU requires no special knowledge. The user can perform all computer tasks in exactly the same manner as with a stock system, and still gain the benefit of the greatly accelerated speed. The toggle switches on the unit are clearly labeled, easily accessible, and can be used without having to refer to a manual in order to determine their function. As with CMD's RAMLink, the SuperCPU has been designed to work out-of-the-box with any C64 or 128 computer - no manual "tuning" adjustment is required.

## Compatibility

The SuperCPU operates with C64 and 64"C computers as well as the C-128/128-D in 64 mode. The 65C816 supports all legal 6502/6510/8500/8502 opcodes and will therefore provide a very high level of compatibility with existing software. The C-64 memory map is emulated exactly by the PLD, and proprietary write-thru logic in this chip ensures full compatibility with all VIC graphic modes and memory mapping.

**REU's:** The CPLD chip in the Super CPU includes special DMA transfer logic to provide 100% compatibility with all types of data transfers to and from Commodore REU's. The SuperCPU does not have to be slowed down to 1MHz in order to initiate a DMA transfer to/from the REU.

**RAMLink:** The Super CPU is 100% RAMLink compatible, and contains its own version of RLDOS, which runs from the SuperCPU's high-speed Static RAM. The faster RLDOS, along with the efficiency of new 65C816 opcodes allow faster data transfers to and from RAMCard's memory as well as to and from CMD HD-Series hard drives connected to RAMLink's parallel port.

**GEOS:** Version 2.0 will be 100% compatible. Special adaptation software will be provided with the SuperCPU allowing GEOS to run at full speed.

## Performance

To help achieve its high level of performance and to accommodate the 10 or 20 Mhz speeds, all operating system routines are downloaded into 64K of the high-speed Static RAM upon power-up, eliminating the bottleneck caused by ROM-based operating system code (on PC's, this technique is called ROM-BIOS shadowing). 64K of high-speed SRAM remains free for programs. In addition, buffered write-thru circuitry (similar to PC cache-controllers) eliminates the need to slow down when writing data back into the C64's RAM.

## Additional Features

**Built-in JiffyDOS Kernal ROM:** The computer portion of JiffyDOS is built into the SuperCPU,

providing DOS-Wedge commands and enabling high-speed serial transfer rates to and from JiffyDOS-equipped disk drives. The JiffyDOS enable/disable switch is designed to function on the fly without disabling the Accelerator.

**Cartridge Port Pass-Thru:** Enables the full use of most plug-in hardware devices such as REU's, RAMLink, Swiftlink, SID Cartridge, GEORAM, as well as some software cartridges. These devices will work while the accelerator is running at 10 or 20 MHz.

**GEOS Software:** Custom software to optimize GEOS operation is provided. Additionally, an intelligent write-thru hardware circuit designed especially for GEOS effectively eliminates a major performance bottleneck associated with earlier accelerator designs. This design feature, coupled with the 10 or 20MHz clock speed of the 65C816 will boost the performance of GEOS far beyond anything currently available.

**Speed Selection:** The speed selection switch provides three options: 1) 1MHz mode for compatibility with programs (such as some games) that may operate too quickly in the turbo mode; 2) a "soft" Turbo mode which operates at 10/20 MHz and provides programs with a software speed selection register for switching to a slower speed when necessary; and 3) a "forced" Turbo mode which keeps the CPU in 10/20MHz mode regardless of the setting of the software register. This mode is useful for providing compatibility with existing programs that unintentionally alter the software register. Note: The SuperCPU performs disk access functions properly in all three speed modes. The user can change speed modes by toggling the speed selection switch while the SuperCPU is operating without quitting the current program.

## Expansion Capabilities

The SuperCPU includes an internal connector (called the "Rocket Socket") which will enable the user to plug in a CMD-supplied RAM Expansion card. This card will have on-board SIMM sockets