

CoCo~123



Glenside Color Computer Club, Inc.
Volume 36, Number 2

Carpentersville, Illinois
Summer 2016

CoCo ~ 123 Memory Map

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Upcoming Events:

The 26th Annual "Last" Chicago CoCoFEST! **April 22-23, 2017**
Regular meetings every 2nd Thursday @ Schaumburg Library

G.C.C.C. OFFICERS

Here is the list of 2014 club officers and how to contact them.
If you have questions about the association call one of the officers for the answers.

| POSITION | NAME | PHONE | PRIMARY FUNCTION |
|-----------------|------------------|--------------|-------------------------|
| ----- | ----- | ----- | ----- |
| President | Tony Podraza | 847-428-3576 | The buck stops here... |
| Vice-President | Chris Hawks | 815-943-4690 | Meeting planning, etc. |
| Treasurer | Geo Schneeweiss | 815-832-4441 | Dues and Purchasing |
| Secretary | Bob Swoger | 630-589-4692 | Records and Reporting |
| Director | Tony Podraza | 847-428-3576 | CoCoFEST! Organizer |
| Librarian | Brian Goers | 708-805-1888 | Software/Hrdwr Manager |
| Editor | John Mark Mobley | 847-409-8604 | Newsletter Production |
| ----- | ----- | ----- | ----- |

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Chris Hawks



Robert Swoger



George Schneeweiss



Brian Goers



John Mark Mobley

CoCo~123 - A Glenside Publication Since 1985

CoCo~123 INFORMATION

CoCo~123 is the newsletter of the Glenside Color Computer Club. Your annual contribution of \$15.00 helps to keep our club going. Send your check to:

George L Schneeweiss, Glenside Treasurer
13450 N 2700 E Road
Forrest IL 61741-9629

Our treasury provides newsletters and good times with fellow CoCo users at our Annual "Last" Chicago CoCoFEST! and Annual Glenside Picnic.

CoCo~123 CONTRIBUTIONS

If you have any suggestions for the newsletter or would like to submit an article, please contact the CoCo~123 Newsletter editor:

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G. C. C. C. MEETINGS

The Glenside Color Computer Club meets the second Thursday of each month at the Schaumburg Township District Library at 7:00 pm. If you need a map, see our Glenside Homepage at:

<http://glensideccc.com/splmap.html>

A social get-together always follows the meeting at a nearby restaurant we lovingly call, "The Meeting After".

FROM THE PRESIDENT'S PLATEN

This year, we have had the best-attended CoCoFEST! we have had in 7-10 years. Thank you all for your support.

We look forward to an interesting addition next year. You may, or not, know (yeah, right) that the Color Computer was the first foray into the COLOR graphics realm by Tandy, but by no means was it the first foray into computers. Glenside has taken the opportunity for the 2017 CoCoFEST! to invite the supporters of the Model 1 upwards through the 4, et. al., to attend the 2017 CoCoFEST!,,, perhaps even to have a display area for the FEST! attendees to see/remember what prompted Tandy to develop the customer base for our beloved hardware. As I said, it looks interesting.

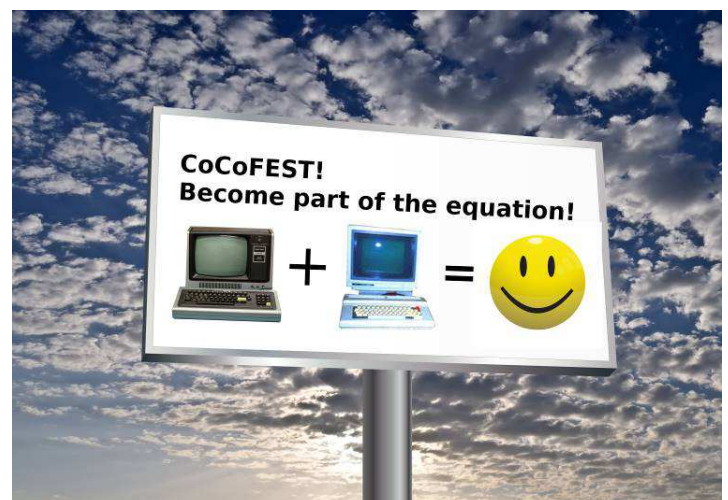
Over the years, I have enjoyed being your auctioneer for the "No Minimum Bid" Auction. There have been some crazy moments and some really esoteric donations. And then there was the year of the "Two Buck Tape Drives".

Three years ago. we had visitors from the Vintage Computer Festival Midwest, which focuses its attention on Commodore/Apple/Atari/Altair and other early home computer era hardware. They experienced our auction for the first time... and loved it. The next year, they were forced to find a different venue for their get-together and were surprised with the huge increase in costs. SO, in the same vein of cost-coping as Glenside has been doing, they tried their first NMBA. It greatly helped to meet the cost. This year, I attended their Festival, and their auction... as a bidder. I have not bid on the Glenside Auctions as I was the auctioneer, but now I have seen it from the other side. It was great. I might add that I tried to drive up the bid on a system for them, as some of you have done at CoCoFEST! and oops... well... I walked out with the system. But if I hadn't had a use for it, I would not have gotten in bidding... JUST LIKE SOME OF YOU. A fun time was had by all. The highest form of flattery is imitation. Your enthusiasm during our auctions has helped another user group to meet their needs. Again, thank you for your support.

Dusty from the TRS8Bit newsletter is rolling around ideas for a contest for 2017, but it is just a germ of an idea, so far. More to come on that. Any suggestions? Shoot him an email.

Till next time, I bid you peace.

Tony Podraza, President
Glenside Color Computer Club



TREASURY NOTES

We have \$5963.59 in checking. We have 78 paid members in 2016, up from 76 in 2015, and a total of 500 members to whom we send newsletters.

George Schneeweiss, Treasurer
Glenside Color Computer Club

THE SECRETARY'S NOTEBOOK

Those of you who attend our meetings know that finding a date for the picnic was rather difficult this year. Our normal date was changed due to VCFMW having their fest the same weekend. The club changed the picnic date to September 17. A wedding planned for the same date nullified this date. Finally August 20 was picked but that promised to be a day of on and off rain. Though our number was about half what it was in previous Annual Picnics, the participants, 15 in all, had a good time with plenty of good food and plenty of socializing.

Another setback for the club is the loss of our meeting room at the Schaumburg Township Public Library. After our October meeting that meeting room will exist no more. We will now have to plan for our future by finding a new meeting room.

Bob Swoger, Secretary
Glenside Color Computer Club

THE EDITOR'S CLIPBOARD

I want to encourage people to write some articles that will appeal to the younger generation. If our club is to continue, we need to attract younger people to our club.

My company had some interns that worked with us for the summer. I sent them a lot of emails to teach them different things about computer history, debugging, and other topics. I decided that some of these emails could be used as newsletter articles and I have included them in this issue.

John Mark Mobley, Editor
Glenside Color Computer Club

Why Are They Called IBM-Compatible Computers?

by: John Mark Mobley

In the 1980s there were many brands and models of computers, but they were not compatible with each other. If my friend had a program that ran on an Apple][e and I had a Commodore 64, then I could not borrow his floppy disk and run his program on my computer. The BASIC interpreters were incompatible, the hardware was different, and there was no hardware abstraction layer. The cassette tape format was different and the floppy disk formats were incompatible. Programs had to be ported (or rewritten) from one

machine to another. I think some people made virtual machines (and hardware abstraction layers) so that they would not need to port the entire program. The best way to share data from one computer to the next (in those days) was a serial port or a modem.

When the International Business Machines Personal Computer (IBM PC) Model 5150 was made, it was a good machine. It was expandable, but too expensive for most people. It had a Basic Input/Output System (BIOS) or Hardware Abstraction Layer (HAL). The BIOS contains firmware for doing things like reading the keyboard, displaying text on the screen, managing files, managing the serial ports, managing the Real-Time Clock (RTC) and Complementary Metal Oxide Semiconductor (CMOS) settings. If software used BIOS calls instead of directly accessing the hardware, then the BIOS could compensate for differences in hardware from one machine to the next.

Then Korea (or was it Columbia Data Products based in Columbia, Maryland?) copied the IBM machines, calling them IBM-compatible computers, importing them into the US. They became very popular. Because they were almost exact copies, they worked just as good (or almost as good) and sometimes faster at a lower price. They let IBM set the standard. Now there was compatibility between brands. Not only was the software compatible, but the expansion Input/Output (I/O) cards were compatible also. The idea of compatibility caught on and these computers started to sell.

Then came the IBM XT, then the IBM AT. The IBM AT had a wider data bus (16 bits instead of 8 bits) and twice the clock speed, so it was about 4 times faster. That was good, but what made it better was that it was backward compatible with the IBM XT. Any software that would run on the XT would run on the AT. The only problem was that some games increased their speed so much that a human could no longer play them.

The IBM compatible computers came out with upgraded computers that were also backward compatible. Some of them had a turbo button so you could slow the computer down to make games playable again and speed it up to do other tasks.

The original IBM XT floppy was a 5.25" 360KB format. Then later they came out with a 5.25" 1.2MB format, but the newer drive could still read the older 5.25" 360KB floppies. This is another example of backward compatibility.

The compatible computer brands like Compaq had to design their own hardware and make their own BIOS. They were forbidden to copy IBM's BIOS. They had one group of engineers convert the operation of IBM's

BIOS operations into specifications. Then they had another group of engineers convert those specs into a BIOS that was truly their own. The second group never saw the original BIOS disassembly so they could not be accused of copying (or reverse-engineering the code after seeing exactly how it worked). This is how they got around the copyright laws of the time. The second group of software engineers were said to be in a clean room of sorts. This idea is what made IBM-compatible computers legal. (By the way, there has just been released a movie called *Silicon Cowboys* that is about the rise and fall of Compaq.)

<https://www.youtube.com/watch?v=Xnp1jruKNOM>

It is apparently difficult to continually improve the computer and software and continue to offer backward compatibility. So this is where emulators come in. Programs like DOSBox and VirtualBox allow for compatibility and backward compatibility.

And so that is a little history of how we got where we are today, and where we are headed in the future.

How To Make A Faster Computer

by: John Mark Mobley

Will computers continue to get faster? Have we reached the end of Integrated Circuit (IC) advancements?

I am thinking that current IC manufacturers are making transistors using 200 atoms per transistor. And soon they will be making transistors using 100 atoms, and then 50, and then 25, and then 12, and then 7. And then that will be the limit and they will not be able to shrink a silicon transistor any more than that. And then perhaps IC manufacturers will need to increase the cost of their products in order to maintain profits. Rather than getting more chips out of the same amount of silicon / sand, they will get more money for each chip.

A modern 23 nm Central Processing Unit (CPU) may run at 1.2 volts and 70 amps. So now let's double the computing power without increasing the electrical power. If you shrink the size of the transistor a few times, then it may need to run at 0.6 volts and 140 amps. $1.2 \text{ volt} * 70 \text{ amps} = 0.6 \text{ volts} * 140 \text{ amps} = 84 \text{ watts}$. So now the electrical power is the same. But driving this much current into the package's leads is a challenge. You may need to increase the size of the package in order to overcome this challenge. If you are going to make the package bigger, then how about doing it in a way that shrinks the overall size of the computer? What if you integrate the Basic Input/Output System (BIOS) and Solid State Drive (SSD) into the CPU?

Rather than making faster single-core CPUs, IC manufacturers have started to offer multi-core CPUs.

Each core is a separate microprocessor. This allows for parallel processing. Not all programs can take advantage of parallel processing. But there is still an advantage because the Operating System (OS) can use one core, a Web server can use another, email can use another, word processing can use another, your spreadsheet can use another, and your printer driver can use another. So you can multitask better using a multi-core machine. Rather than time division multitasking 20 tasks with one microprocessor, the system can do more in parallel using a multi-core machine. A 10-core machine can put 2 tasks on each core for a total of 20 tasks. If a task is of high enough priority, then it might get a core all to itself. Some tasks can be run as multi-threaded tasks and use two or more cores at once.

Also we are starting to see more in the way of distributed computing. A home automation system can now be made up of a number of systems, each with their own CPU. The thermostat has its own CPU. Each camera of the surveillance system has its own CPU. Each voice-operated assistance has its own CPU. So the total system is made up of a number of CPUs.

I think we can make computers faster, but we need to take charge of the whole system.

How to make a faster microprocessor:

- 1) Faster CPU clock
- 2) Fewer clock cycles per instruction
- 3) More Complex Instruction Set Computing (CISC) and less Reduced Instruction Set Computing (RISC). CISC takes up less RAM for the same functionality. It may take five RISC instructions to equal the functionality of one CISC instruction. Less instruction fetches could mean improved speed. Perhaps CISC and RISC could co-exist on the same microprocessor.
- 4) Faster Random Access Memory (RAM) Cache
- 5) Faster RAM
- 6) Faster Hard Disk Drive (HDD) / Solid State Drive (SSD)
- 7) More microprocessor cores. This improves parallel processing.
- 8) Faster communication
- 9) Push some problems to a cloud computer
- 10) Better operating system
- 11) Simple driver with smart and powerful peripheral (i.e.: Don't buy a WinModem / Softmodem)
- 12) Don't consume a lot of processing power for virus protection
- 13) Better code compilers
- 14) Better computer languages
- 15) More speed-efficient programs
- 16) Perhaps the SSD should be a directly addressable part of the memory bus. You do not need to load the program because it is already in memory. Perhaps you should copy the program to RAM, if RAM is faster.

17) Custom instructions stored in the microprocessor in the form of a Field-Programmable Gate Array (FPGA)-like structure. This would be useful for making emulators.

18) Add a peripheral for doing all aspects of communications.

19) Microprocessor instructions for efficiently performing single-bit instructions. Some systems have an area of memory where you can address each bit of a portion of RAM. The bytes can be addressed at another location.

20) More speed-efficient tamper protection.

21) More RAM

22) Integrate the RAM into the microprocessor.

23) Integrate the SSD into the microprocessor. And provide a wider bus so more data can be read at a time. Read an entire sector in one SSD read cycle.

24) Integrate the video hardware into the microprocessor.

25) Build a private local computer cluster (cloud) in your own home. Or network your various home computers together so your applications can share the processing power.

26) Make programs more responsive. My email program should not hang the entire application's user interface when it is busy receiving an email. I should be able to compose an email while another email is being received.

27) Don't let pop-up interfaces block a copy-and-paste operation. My email program has an "Add Contact" pop-up dialog box, but I cannot use copy and paste from the email I am reading. Instead I have to copy the email to a text editor, go to "Add Contact", and then copy the data from the text editor. I want to copy the person's name and email address into the "Add Contact" dialog box. Perhaps making "Add Contact" a pop-up was a mistake in the first place. I have been using an older version of Microsoft Outlook. Clunky user interfaces make for a bad computer experience.

A New Printer

by: John Mark Mobley

Would you pay more for a printer that had lower cost ink cartridges/bottles? Well, Epson has introduced an EcoTank line of printers.

Epson EcoTank models: ET-2500, ET-2550, ET-3600, ET-4500, ET-4550, ET-16500, and WF-R4640

<https://duckduckgo.com/?q=Epson+ecotank&t=hk&ia=web>

<https://duckduckgo.com/?q=epson+ecotank+reviews&ia=web>

The money saved on ink should more than make up for the initial cost of the printer, provided the printer has a long service-free life. Would you use your printer more, if the cost of ink was not so high?

I have no experience using this printer, but I like the idea of lower ink costs.

The History of the Computer Mouse

by: John Mark Mobley

History: The trackball was invented in 1941.

Douglas Engelbart demonstrates the computer mouse in 1968:

https://en.wikipedia.org/wiki/The_Mother_of_All_Demos

Video - The Mother of All Demos (1:40:53) (H:MM:SS):

<https://www.youtube.com/watch?v=yJDv-zdhzMY>

Wikipedia Douglas Engelbart:

https://en.wikipedia.org/wiki/Douglas_Engelbart

Wikipedia Computer Mouse:

https://en.wikipedia.org/wiki/Computer_mouse

Programmers Advice

by: John Mark Mobley

Things you as a programmer should avoid or trap:

1) Dividing by 0

2) Taking the square root of a negative number, e.g. -1 raised to the power of (1/2), (1/4), or (1/6)

3) Computing the tangent of -270 degrees, -90 degrees, 90 degrees or 270 degrees

4) Not testing for a full range of angles. Ex: Phase = { -360, -315, -270, -225, -180, -135, -90, -45, 0, 45, 90, 135, 180, 225, 270, 315, 360}

5) Referencing a pointer that has gone out of scope, e.g. a dangling pointer

6) Overflowing the accumulator

7) In some cases, computing $y=m*x+b$, where $m>10,000$

Ex:

```
100 REM COMPUTE A STRAIGHT LINE EQUATION
110 REM DON'T LET THE SLOPE OF THE LINE BE TOO STEEP
120 MAXSLOPE = 10000
130 MINSLOPE = -10000
140 IF MRUN = 0 THEN M=MAXSLOPE ELSE M=RISE/MRUN
150 IF M > MAXSLOPE THEN M = MAXSLOPE
160 IF M < MINSLOPE THEN M = MINSLOPE
170 Y=M*X+B
180 RETURN
```

Rosetta Code

by: John Mark Mobley

What if someone took the time to write the same program / algorithm in several different languages?

What if there was a Rosetta Stone for programmers?

What if it was called Rosetta Code?

Rosetta Code

http://rosettacode.org/wiki/Rosetta_Code

The list of algorithms is here:

http://rosettacode.org/wiki/Category:Programming_Tasks

This is "Hello World" in a number of different languages:
http://rosettacode.org/wiki/Hello_world/Text

What Do You Call a Flock of Bits?

by: John Mark Mobley

bit is short for Binary Digit

bit => 1-bit
nibble => 4-bits
byte => 8-bits
16-bit word
32-bit word
64-bit word
128-bit word
arbitrary-precision
sector => 256 bytes on a CoCo floppy
granule => 9 sectors (2304 bytes) on a CoCo floppy
A 35-track floppy has 35 tracks and 18 sectors per track. Track 17 is for the directory. So there are 2 granules for the directory and 68 granules for data storage. A 1 byte file will use an entire granule for storage. So a 35-track CoCo floppy has $68 \times 9 \times 256 = 156,672$ bytes of storage.
A 40-track disk has 78 granules for data storage. So a 40-track disk has $78 \times 9 \times 256 = 179,712$ bytes of storage.
An 80-track disk has 158 granules for data storage. So an 80-track disk has $158 \times 9 \times 256 = 364,032$ bytes of storage.
1024 bytes => kilo byte
 1024×1024 => mega byte
 $1024 \times 1024 \times 1024$ => giga byte
 $1024 \times 1024 \times 1024 \times 1024$ => tera byte
 $1024 \times 1024 \times 1024 \times 1024 \times 1024$ => peta byte
 $1024 \times 1024 \times 1024 \times 1024 \times 1024 \times 1024$ => exa byte
 $1024 \times 1024 \times 1024 \times 1024 \times 1024 \times 1024 \times 1024$ => zetta byte

Two bits sometimes means 25 cents. Two-bit sometimes means cheap or trivial.

Ex:

```
100 REM TWO BIT COUNTER
110 REM NOTE: NO TWO BIT COUNTER IS GOING TO TELL
120 REM ME WHAT TO DO!
130 I=(I+1) AND 3
140 RETURN
```

The History of Computers

by: John Mark Mobley

First there were mainframe computers, then minicomputers, then microcomputers, then single-board computers, then single-chip computers, and then multi-core single-chip computers. And then perhaps there will be multi-core single-chip computer clusters, computers based on photons instead of electrons, or perhaps quantum computers.

Digital Equipment Corporation (DEC) Programmed Data Processor (PDP) (minicomputer)

https://en.wikipedia.org/wiki/Programmed_Data_Processor

The word minicomputer had not been invented yet, but the PDP was a minicomputer. The government had said that government agencies weren't to buy a computer until the government had time to study the industry and see where things were headed. Government agencies were able to order DEC PDPs because they weren't called computers. This was a big shot in the arm for DEC.

Minicomputer

<https://en.wikipedia.org/wiki/Minicomputer>

This is a delightful 4 part video that will take you back in time to when the PDP-11 was new. The video is designed to help you appreciate the tools you have today for writing code. This video explains the significance of a 2-pass assembler (because you had to handle the file by hand and feed it in twice). Also note what is being used for a computer terminal. The video is dated May 19, 2000; however, it will take you back to the 1970s.

Programming the PDP-11/10 (I think this 4-part video is about 20 minutes long)

<https://www.youtube.com/watch?v=XV-7J5y1TQc&list=PL5A42F37BD9DEED83>

Microsystems Engineering Corporation (MEC) in Hoffman Estates, IL was owned by brothers Henry and Everett Karles until June 1993. The company developed a product for NASA and its agencies for use on the DEC PDP-11. After that task was completed MEC went on to develop a product named MASS-11. MASS was an acronym for Management Administration System Software. MASS-11 was targeted to companies using PDP 11s for government and R&D work and banks. The product was an integrated software package providing a word processor, database, spreadsheet, and DRAW program along with a modem package; all managed using a menu system to call each routine using only three keystrokes. The printer drivers included all the top of the line printers from Tolaris down to Epson and Star as well as plotters. Because of their target market, this software package was leased and not ever sold. No one else had anything like it.

They next put their product on desktop microcomputers, first the DEC Rainbow, then the IBM AT. Their software was so tight that it all worked on a 10 MEG hard drive! Users did not have to learn how to use the system on the several different machines. It was keystroke for keystroke the same on all machines it was installed on.

They then made a student package to sell at college bookstores. But here they fell to the likes of Word Perfect, Lotus and Netscape who went to those same colleges and gave their software away with candy to promote their products.

In no time, others copied these ideas, and in no time at all, Office was born.

Analog Is Still Alive and Well

by: John Mark Mobley

Most real world interfaces are analog.

Ex:

Audio, voice, and music are analog.

An analog joystick is analog.

The stock market is analog.

Your vital signs are analog.

Temperature, wind speed, and barometric pressure are analog.

Velocity, acceleration, jerk, frequency, force, mass, weight, length, volume, time, electric current, resistance, and luminous intensity are analog.

An Operational Amplifier (op-amp) can be used to perform mathematical operations. The "Operational" in "Operational Amplifier" stands for mathematical operations.

A mixer or mixing board is made up of summing junctions that use resistors and an op-amp. An amplifier is a multiplier. The output of a resistor voltage divider can be connected to an op-amp so as to buffer / increase the drive current of the output voltage. An op-amp has a differential input so that it can subtract. So now you have addition, multiplication, division, and subtraction. You can also make a differentiator and an integrator, so now you have calculus too. And then there are all kinds of frequency filters you can make.

Operational Amplifiers are typically programmed by connecting resistors and capacitors to form a circuit.

Analog-to-Digital and Digital-to-Analog circuits are common in computer controlled systems.

A telephone may convert analog voice/speech to digital, and then transmit it a distance, then at the receiving end convert the digital back to analog voice so the user can hear.

Analog circuits, analog computers and hybrid analog/digital circuits are common in the world today.

Key:

AM => Amplitude Modulation

FM => Frequency Modulation

RF => Radio Frequency

IF => Intermediate Frequency

AF => Audio Frequency

AGC => Automatic Gain Control

AVC => Automatic Volume Control

DSP => Digital Signal Processor

SDR => Software-Defined Radio

A radio is another example of analog circuits. A good system will provide both selectivity and sensitivity. A good AM and/or FM radio will often be a super heterodyne receiver that uses a converter to transform the RF to an IF. The purpose of the IF is to filter the incoming signal to provide an output signal with the narrow bandwidth required for music, voice, or CW (continuous wave) tone to the speaker. This feature is called selectivity. Then the detector will convert the IF to an AF. Selectivity allows you to select the channel you want to hear without adjacent channel interference.



I think this is an Analog Computer disguised as a Radio

Sensitivity is the ability to receive a very weak signal. This is accomplished with the use of an RF amplifier ahead of the converter. In the case of an already strong signal, the radio may use AGC to limit the amount of signal delivered to the converter to maintain good selectivity.

DSP and SDR are becoming more common in radios but analog circuits are still part of the radio.

Heisenberg's Uncertainty Principle

by: John Mark Mobley

Heisenberg's Uncertainty Principle has to do with the measurements of sub-atomic particles, but his principle can be loosely tied to all measurements.

The general principle is any time (or almost any time) you make a measurement you are changing (or disturbing) the thing you are trying to measure.

If someone knows that they are being watched, then they may behave differently. Electronic circuits or software may seem to behave in a similar manner.

If you want to test an electronic circuit, you may decide to connect a voltmeter to the circuit, but connecting a

voltmeter will change the resistance or impedance of the circuit, because the voltmeter will load down the circuit. So you are not testing the circuit, but you are testing the circuit with a meter attached. If you are reading the voltage across a 1k-ohm resistor and the voltmeter has 1M-ohm input impedance, then the change will be small (perhaps 0.1%). But the higher the resistance, the more the meter will affect the circuit (depending on the circuit).

Ex: The meter is represented as a 1M ohm.

| Test Resistor | Meter Impedance | Parallel Resistance | Accuracy in Percent |
|---------------|-----------------|---------------------|---------------------|
| 1 | 1,000,000 | 0.999999 | 99.999900% |
| 10 | 1,000,000 | 9.999900 | 99.999000% |
| 100 | 1,000,000 | 99.990001 | 99.990001% |
| 1,000 | 1,000,000 | 999.000999 | 99.900100% |
| 10,000 | 1,000,000 | 9,900.990099 | 99.009901% |
| 100,000 | 1,000,000 | 90,909.090909 | 90.909091% |
| 1,000,000 | 1,000,000 | 50,000.000000 | 50.000000% |
| 10,000,000 | 1,000,000 | 909,090.909091 | 9.090909% |

I once had an oscillator that only worked when I attached it to an oscilloscope. Apparently the capacitance of the oscilloscope input was just enough to make the oscillator work.

This principle also applies to software testing. Debugging can be elusive because the behavior may change as you try to discover what is going on. At times this can make you feel that the system has consciousness. It is as if it is watching you and deliberately changing its behavior in order to disguise what it is doing. When this happens you need to remember that just taking a measurement can change the results.

If you add some debug code, then the compiler may change how it optimizes the code. The optimizer may completely eliminate some code, if it sees that nothing is referencing it. But once you add some debug code to check on the results, the optimizer sees it is referenced, and puts the code back in. If you study the final assembly code a little, you can pick up on what is going on with optimization.

If you compile for debug vs. release, then you are changing the code. If you add debug code, then you are changing the code. If you add a debug print statement, then you are changing the code and/or the timing of the code. If you single-step the code, then you are changing the timing of the code. If you set a breakpoint in an UART interrupt receiver routine, then you will likely get an overrun error on the next byte, call, or iteration. A race condition may change its behavior if you change the code or the timing.

You may find that leaving some debug code in place at all times can fix the code.

Unit tests are good because they do not change the code being tested.

The Hobbit Ported to 6809

by: Pere Serrat

This is the DEFINITIVE FINAL version for The Hobbit (v16f4). It runs at double speed on any emulation of a CoCo3 also.

On real hardware with real floppies it is MANDATORY to use it at the normal speed! Only with CoCo-SDC and other modules like that you could try the double speed: `LOADM"HDS":EXEC`

To play at normal speed, just Enter: `LOADM"H1":EXEC`

From my experience, I can confirm that it runs flawlessly at double speed in Vcc and in my CoCo3 with the CoCo-SDC card. But it fails when saving/restoring saved games from actual floppies! So, please don't use double speed with floppies, or do it at your own risk! The needed changes to take into account the double speed won't fit in the small residual free space in the 64k area and in fact it doesn't make a big difference compared to the normal speed. Art, you were soooo right!

By the way, I had to put back the `POKE&HFFDE, 0` so that SEB gets disabled. Some of the 27 patches done at startup, when called, redirect the code to data structures of the Hobbit, sending the program to la-la land.

The program supports now these DRAGON Disk Operating Systems (DOS)

Dragon Data: DDOS10, DDOS11C, DDOS12A, DDOS13A

Eurohard: DDOS41

3S: DosPlus4.9B, DosPlus5.0

Grosvenor: SuperDOS E6, E7 and E8

I have tested the game with these COCO Disk Operating Systems (DOS)

RS-DOS1.1, RS-DOS1.2, RS-DOS1.2A and VCC for CoCo3 (NO RS-DOS1.0, sorry)

You can find info about the project and download the VDK on these threads:

<http://retrowiki.es/rw30/viewtopic.php?f=84&t=68&start=304#p4516>

<http://retrowiki.es/rw30/viewtopic.php?f=84&t=357&start=32#p4517>

Note: The website is in Spanish language.

You could find info and download the two DSK in these threads at:

WorldOfDragon

<http://archive.worldofdragon.org/phpBB3/viewtopic.php?f=5&t=5521&start=10#p15094>

<http://archive.worldofdragon.org/phpBB3/viewtopic.php?f=5&t=5526#p15095>

We Had Us A Picnic!

by John Mark Mobley

The picnic was held at the home of Bob and Annette Swoger this year. Earlier in the week in anticipation of the coming picnic the village repaved the entire street in front of the Swoger's home so there wasn't a crack or pothole on their entire street.



It was threatening rain when Melanie and I arrived but it didn't last all that long.



So the first thing Tony and I did when we arrived was to erect the tent over the entire picnic table in the back yard.



Most of the time it was sunny with blue skies, giving us much time to socialize and snack. When it would start to rain, which never lasted long, we would just move to the tent and let it pass.



Because of the periodic rain we set up the dining room with all the pass-arounds rather than using an outdoor setup. Pass-arounds are provided by our participants with the thought of bringing something new for the others to enjoy. If you don't try a little of everything, you may miss a great culinary experience.



All-American Apple 3.141592653...



There were plenty of desserts to go around. When the day was gone, so were these, as was most of the apple pie.



Tony was our chef of the day. He cooked the hot dogs, steak burgers and brats to perfection!



including our friends Chris and Nancy Hawks (broken hip), George Schneeweiss (flooded basement), Donna and Dave Barnes, and Dr. Eddie Kuns with his daughter to name a few.



Just ask Brian Goers how those burgers turned out! Somehow I see the answer in his face.

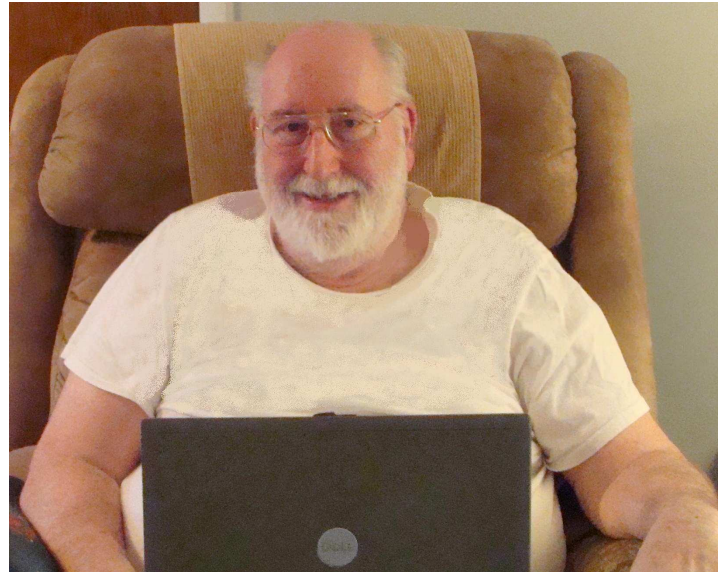
Brother Jeremy holds the distance record today for driving 77 miles to join us. The Abbott of Aldengate not only comes here for the food, but also for the fellowship we all need during this all-too-short time of rest to remember in prayer our 15 folks that could not be here



Proud mom Linda Podraza's youngest son Sam educated us on the finer points of Pokemon Go.



Brian Schubring who had rebuilt the woofers in both of Bob's MACH 1 speakers discusses his next project, putting Bob's Hallicrafters Linear Amplifier back on the air.



Bob (aka Captain ==GATOR==) in his Captain's chair with his newly acquired rebuilt laptop that contains 4G of RAM and 180 G hard drive. **LogiCall** is onboard.



Melanie, Annette, & Brian enjoy a break in the weather.



Brian & Brother Jeremy



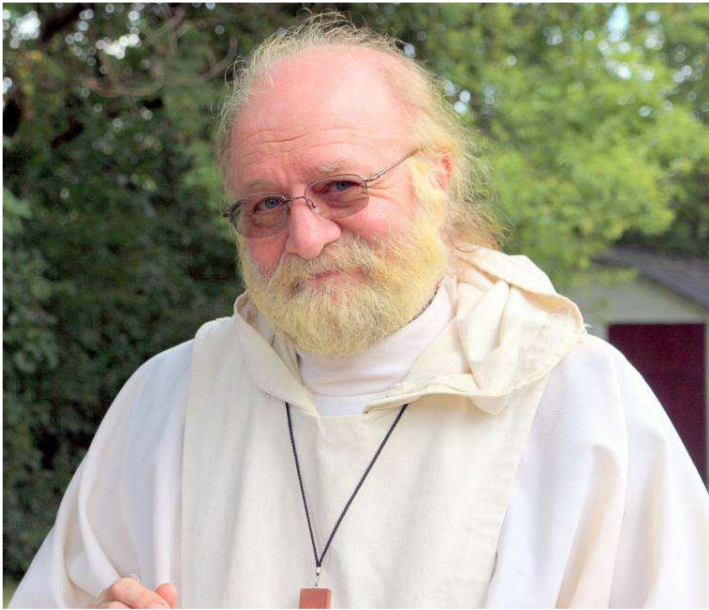
Carey Schug of Des Plaines, IL (back left) joined us at the picnic for his first time this year. Andy Weiler (picture on the right) arrived a bit late but there was still plenty of food left to try.



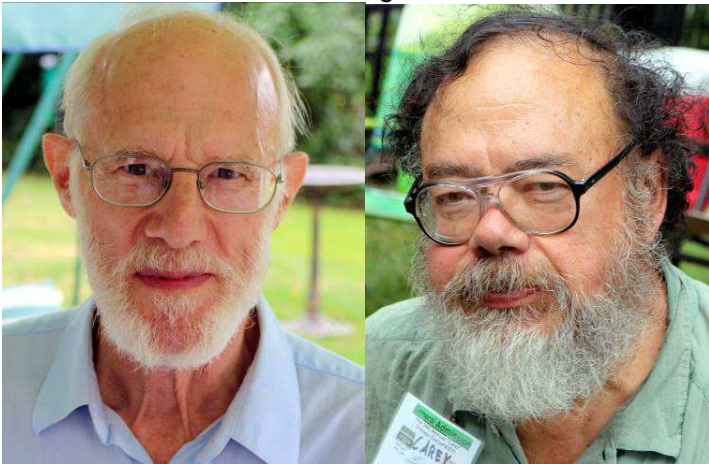
Brother Jeremy always has a story... or ten... to tell.



Hmm...there were no bees this year?



A man out standing in his field...
A man outstanding in his field...



Rich Bair & Carey Schug.

During the meeting we discussed the loss of our meeting room at the Schaumburg Township District Library. The Library is remodeling and removing our room from service. In November we will try to acquire one of their breakout rooms for our meeting. What we will do in the future may be another story.



Rich & Annette work on their suntans.



Incoming cell call, Rich?



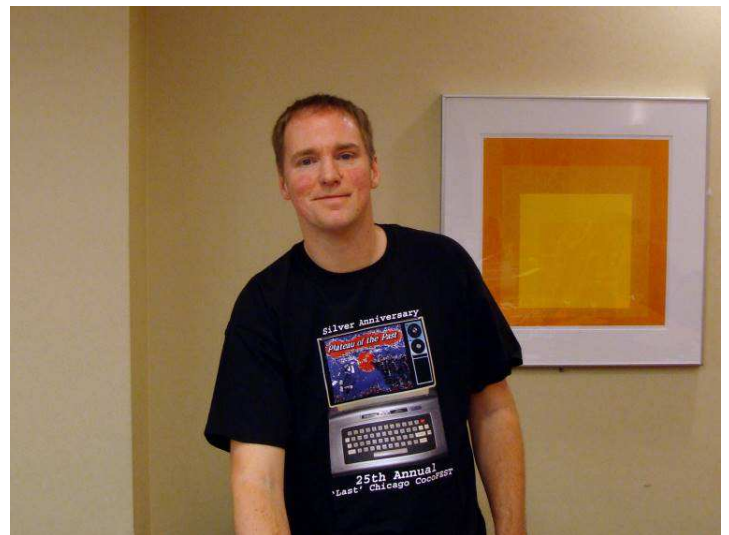
Annette was the hostess with the mostess.



John Linville attended on Google Hangouts



The Family / Club Take 1 from 2015



Neil Blanchard attended on Google Hangouts



The Family / Club Take 2 from 2015



Calendar of Events

By John Mark Mobley and Salvador Garcia

Saturday and Sunday, October 1-2, 2016

Retropalooza

Arlington Convention Center

Arlington, TX, USA

Link: <https://www.facebook.com/theretropalooza/>

Maker Faire Milwaukee

Saturday and Sunday, September 24-25, 2016

Wisconsin State Fair Park

West Allis, Wisconsin, USA

Link: <https://makerfairemilwaukee.com/>

Glenside Color Computer Club, Inc. Business Meetings

Thursday, October 13, 2016

7:00 PM to 10:00 PM CDST

Schaumburg Public Library

130 South Roselle Road

Schaumburg, IL, USA

Google Hangouts access is available via John Mark Mobley.

Saturday October 15, 2016

Chicago International Faire

This is a Texas Instruments TI-99/4A computer festival

Evanston Public Library

Evanston, IL, USA

Contact Faire Chairman Hal Shanafield for more info

Link: <http://www.chicagotiug.com/tiki-index.php>

Friday, Saturday, and Sunday October 21-23, 2016

Portland Retro Gaming Expo (PRGE)

Oregon Convention Center

Portland, Oregon, USA

Link: <http://www.retrogamingexpo.com/>

Saturday, and Sunday December 3-4, 2016

World of Commodore 2016

Toronto, Ontario, Canada

Link: <http://www.tpug.ca/category/woc/>

Wednesday December 21, 2016

The Fall newsletter should be released by this date

Monday March 20, 2016

The Winter newsletter should be released by this date

The 26th Annual "Last" Chicago CoCoFEST!



2017 CoCoFEST!
Proudly Presented By
The Glenside Color Computer Club
Fairfield Inn, Lombard, Illinois

Here are the 5 "W's"

WHO? 1) Glenside Color Computer Club, Inc.
PRESENTS

WHAT? 2) The 26th Annual "Last" Chicago CoCoFEST!

WHEN? 3) April 22 & 23, 2017

(Sat. 9 am to midnight - Sun. 9 am-3 pm)

WHERE? 4) Fairfield Inn & Suites Lombard
645 West North Avenue
Lombard, IL 60148

(Near the intersection of IL-355 and North Avenue)

(Same location as 2016!)

Overnight room rate:

\$92.00 plus 11% tax (\$102.12 Total)

Call 1-630-629-1500 for reservations.

You must ask for the Glenside "CoCoFEST!" rate.

>>> YOU MUST REGISTER UNDER "CoCoFEST!" <<<

>>> TO GET THIS RATE <<<

WHY? 5)

- A. To provide vendor support to the CoCo Community**
- B. To provide Community support for our CoCo Vendors**
- C. To provide educational support to new users.**
- D. TO HAVE AN OUTRAGEOUSLY GOOD TIME!!!**

And now, the "H" word.

HOW MUCH? All Attendees - General Admission

Both days: \$10.00 1st - \$5.00 2nd & more

Sunday Only: \$5.00 1st - \$5.00 2nd & more

******* Children 12 and under - FREE *******

For further information, general or exhibitor, contact:

Tony Podraza, GCCCI Robert Swoger, GCCCI

847-428-3576, VOICE 630-847-7026, VOICE

tonypodraza@gmail.com rswoger@aol.com

Please note the new starting times, 9 AM, not 10 AM.

**Be sure to visit our Website to see up-to-date information
on upcoming events. <http://glensideccc.com>**