

# CoCo~123



Glenside Color Computer Club, Inc.  
Volume 37, Number 3

Carpentersville, Illinois  
Autumn 2017

## CoCo ~ 123 Memory Map

<i>Routines</i>	<i>Address</i>
-----	-----
GCCC Officers.....	1
GCCC Information, Contributions.....	2
Contributors to this Issue, GCCC Meetings.....	2
From the President's Platen.....	2
Trea\$ury Note\$, Secretary's Notebook.....	3
Editor's Clipboard, CoCoTALK!.....	3
Rainbow Online, I'm A Coconut Dot Com.....	3
Tandy Forum, Bomb Threat Game.....	4
Magnetic Inductive Circuit Tracer.....	4
Clearing a Hidden or Buried Short, Tandy Assembly..	4
The 27th Annual "Last" Chicago CoCoFEST!.....	8
CoCo Happenings.....	9
CoCobits: The 6309 Piggyback.....	10
Retrojetsonian.....	11
I Want my CoCo TV!.....	12
Merry Christmas .....	13
Calendar of Events.....	14

**Upcoming Events:**  
 The **27th Annual "Last" Chicago CoCoFEST! April 21-22, 2018**  
 Regular meetings every 2nd Thursday @ Schaumburg Library.

**G.C.C.C. OFFICERS**

Here is the list of 2017 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	Brian Goers	708-805-1888	Dues and Purchasing
Secretary	Rich Bair	847-835-1309	Records and Reporting
Director	Tony Podraza	847-428-3576	CoCoFEST! Organizer
Librarian	Brian Goers	708-805-1888	Special Events
Editor	John Mark Mobley	847-409-8604	Newsletter Production
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Tony Podraza



Chris Hawks



Rich Bair



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:

Brian Goers, Glenside Treasurer  
3312 Miller Avenue  
South Chicago Heights, IL 60411

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

If you attend the Annual CoCoFEST! your annual contribution is covered for that year.

## 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:

John Mark Mobley, Editor  
4104 Wren Lane  
Rolling Meadows, IL 60008  
[johnmarkmelanie@gmail.com](mailto:johnmarkmelanie@gmail.com)

## CONTRIBUTORS TO THIS ISSUE

Salvador Garcia  
Brian Goers  
John Mark Mobley  
Tony Podraza

## G. 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 the following link:

<http://ncmedals.com/glenside/splmap.html>

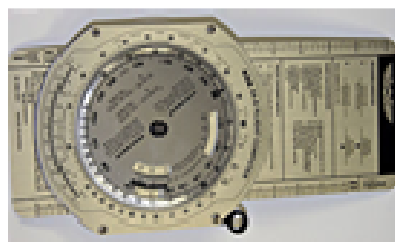
A social get-together, which we lovingly call "The Meeting After", always follows the meeting at a nearby restaurant.

## FROM THE PRESIDENT'S PLATEN

<http://www.glensideccc.com/cocofest/index.shtml>  
<https://tinyurl.com/yde33xf>

I could stop here, but then we would need a whole lot more to fill in the newsletter, so, a little personal history. I was born in 1952, July 12th @ 23:15 hours, Anchorage Alaska, to be exact. My dad used a computer quite regularly. Oh, not the ENIAC, or the UNIVAC I, or the EDSA or any of the multitudinous multi-lettered names of the day, but the E6B, probably known to every military and or civilian aircraft pilot and navigator since 1935. Since my dad entered into the Army Air Corps in 1944 (and then flew the Hump in Burma), I am sure that he used one of these or a variant, thereof. I should go out to the garage and get his. I know where it is. But this is close enough:

.....



It is a slide rule and so much more.

On Dec. 15, 1965, Lt. Col. John M. Podraza's military service ended on the side of a mountain at Cape Romanznof. (No pity party, here, please. Life happens). It was not a computer error, either, but whiteout conditions while bringing supplies to the men at the DEW line station, there, 500 plus miles from Anchorage, probably using the E6B to get there. The point is that whatever assists humans to crunch numbers is a computer, and there are thousands of examples...the abacus, the E6B, the much newer electronic dash mounted displays, etc.

On April 21st and 22nd, 2018, you will have the opportunity to take in our raison d'etre, the Tandy/Radio Shack Color Computer in all of its various forms...original and (in 1985) futuristic ICs (CoCo on a Chip), etc.

Every year that this rolls around, I am increasingly surprised at what brains can think of...and then convert to reality... (yes, and Jim's also). One of the early things that I watched develop from a challenge at a meeting after the meeting at the Springdale restaurant in Bloomingdale, IL was an RGB to VGA converter..."that can't be done" 3 months later, the boards were made, the pieces were being inserted and there was a massive soldering party at a regular Glenside meeting. These things still happen... at 23:00 to 02:00 CoCoFEST! Friday night (right, PCdoc?). Unfortunately, not all of my soldering was expertly accomplished...but we had a whaler of a lot of fun. It was a good thing that we had plenty of coffee in the morning.

It would be selfish of me (and the rest of the Glenside Board) not to invite you to the FEST!ivities, so come along. We want to meet the ones, face to face, with whom we have been reciprocally typing.

This year's theme is FUSION! Not the atomic kind, but the fusion of technologies, the 68/6309, the operating systems, the PI, the, oh bother...come on to the ChiTown area and see for yourself.

We are gonna have a BALL!

Till next time,

I bid you peace.

Tony Podraza, President  
Glenside Color Computer Club

## **TREASURY NOTES**

The money for Glenside as of September is \$6593.34. We have added only interest collected for this month.

Brian Goers, Treasurer  
Glenside Color Computer Club

## **THE EDITOR'S CLIPBOARD**

We are looking for people to submit articles for the newsletter.

John Mark Mobley, Editor  
Glenside Color Computer Club

**Rainbow Online**  
by Salvador Garcia

The Rainbow Magazine was established in 1981 by Lonnie Falk. It started out as a simple two-page newsletter which grew to be one of a few iconic magazines that supported the Color Computer. This helped make the Color Computer one of the most popular personal microcomputers at a time when the 6502 and Z80 ruled the Earth.

Today, we gleefully welcome the online reboot of The Rainbow. Although not associated with the original publishing company or founders, The Rainbow Online promises to fill a much-needed information void.

The credits at the magazine's Website list Steve Strowbridge as the Editor and Publisher, Ron Delvaux as the Art and Graphic Designer, and Steve Batson and Steve Strowbridge as the Web designers and managers. The Rainbow Magazine Online started off as a mock cover created by Ron D. as a homage to the original Rainbow Magazine. After Ron presented the image on the Facebook group, a discussion started. Enthusiasm to bring back The Rainbow grew to the point where Ron created a 22-page prototype of an entire magazine. Steve S. caught wind of this wave of enthusiasm and jumped in, creating an online presence and home for the magazine using WordPress. Soon, the WordPress skills of Steve B. were recruited (drafted?) and the result is what we see today.

The magazine is still in its infancy, but has the potential for growth.

The online magazine follows a friendly approach to publishing articles. People are invited and encouraged to visit the Website and create an account. Once the account is created, the user can publish an article. Once approved, the article goes online for everyone to see. All topics related to the CoCo are welcomed. The article does not have to document an extraordinary project. It can be as simple as sharing an experience with the CoCo. The intention is to share by contributing.

Everyone is encouraged to submit content to the online magazine. In many cases, the experiences that we have with our computers may be trivial, but may be of interest to others. Did you solve a weird issue with the CoCo? Did you find a program particularly useful? Tell others about it. Many people believe that they need to have an extraordinary topic or skill to contribute, but this is not the case. Anyone that has asked a question in a public venue and has gotten the right answer can cobble together a few paragraphs explaining what the problem was and how it was solved.

Sharing benefits the community greatly, because there are few venues where Color Computer enthusiasts can get information about this computer. As far as publications, the CoCo ~123 newsletter has stood alone for a number of years. More publications about the Color Computer are needed, and as evidenced, welcomed into the fray of resources.

But any venue is worthless without the participation of the community. It is its passion and involvement that makes or breaks a venue. The community invites people to submit content to the available publications so that we can all benefit and motivate others to take the first step.

We can take the original Rainbow Magazine as a role model. Lonnie started this publication in an extra room in his house. In a time where scanners were scarce and expensive, and the Internet was unheard of, he produced the first two-page issue on a Radio Shack Line Printer VII and initially distributed 25 photocopies of it for \$1 USD each. Such a modest effort had an impact. Soon he moved his operation to his basement and from there to a commercial facility. After a few years The Rainbow was the premier magazine for the Color Computer, providing articles on varying topics, from technical engineering how-tos to product reviews.

Having the Internet as a resource means that anyone, anywhere in the world, can enjoy and learn from The Rainbow Online, but most importantly, can also participate. Our community stretches from the US and Canada to Brazil, to Europe, and Australia. The Internet provides the channel while these online venues provide the opportunity. I am certain that this new publication welcomes everyone's participation, as so does this CoCo ~123 newsletter. (I could not leave this venerable publication out<g>.)

<http://www.therainbow.online/>

**I'm A Coconut Dot Com**  
by John Mark Mobley

Check out the link below.

<http://imacoconut.com/>  
<http://imacoconut.com/resources-and-archives/>

**Tandy Forum**  
by John Mark Mobley

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Check out the link below.

<http://tandyforum.org/>

**Bomb Threat Game**  
by John Mark Mobley

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It is a remote-controlled vehicle with a mission. The mission is keeping the boxes and the bombs apart.

This game is by Rick Adams.

Rick Adams gave a speech at Tandy Assembly titled "The Resurrection of Bomb Threat". He told a good story about how it was created a long time ago but got lost and had to be recreated all over again. The game was able to be recreated because someone had a video tape of the original. Link to the conference:

<https://youtu.be/TChU95TE7H4?t=4914>

**Magnetic Inductive Circuit Tracer**  
by John Mark Mobley

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Assuming there is a short across two pins...

It may be possible to locate the short using a suction cup-type telephone inductive pickup coil.

Steps:

- 1) Create an AC signal that works with the telephone pickup coil. You can use a 60 Hz to 1k Hz sine wave, or a square wave, or a 555 timer, or you can use music and an audio amplifier. This signal should be current-limited to 100 mA or so, depending on the sensitivity of the telephone pickup coil.
- 2) Place the AC signal across the shorted pins.
- 3) Connect the telephone pickup coil to an audio amplifier and speaker.
- 4) Move the telephone pickup coil around until you hear the AC signal.
- 5) The telephone pickup coil is directional like a directional antenna. It picks up at 0 degrees and 180 degrees from the suction cup.
- 6) Trace the short using the telephone pickup coil like a stethoscope.

You need to use the inductive signal tracer in an electrically quiet area. You need to be far away from fluorescent lights and Cathode Ray Tube (CRT) displays. The inductive signal tracer can be used to locate sources of noise as well. Some modern Light Emitting Diode (LED) Edison base lamps used to replace incandescent Edison base bulbs can be noisy. A good old-fashioned incandescent light should be just fine.

**Clearing a Hidden or Buried Short**  
by John Mark Mobley

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Assuming there is a short across two pins...

The short may be buried inside a 4 layer board.

Locating the short is sometimes very difficult, so the idea is to treat the short as a fuse and deliberately blow the fuse with high power.

If you damage the circuit board in the process, then it is not a problem, because it was bad anyway.

Steps:

- 1) Unplug the item.
- 2) Get a power supply and set the voltage to 0.5 volts and set the current limit to 2-7 amps.
- 3) Set up a camera to record the flash of light. Perhaps an infrared camera could be used with lower current.
- 4) Momentarily place the power supply across the two shorted pins and look for a flash of light.

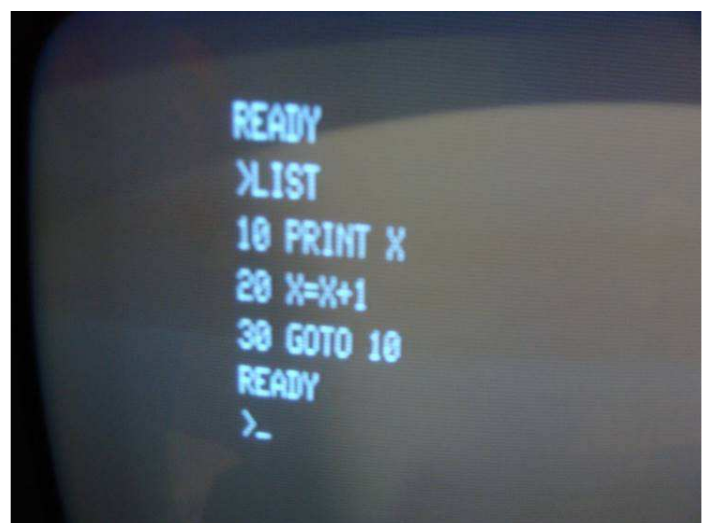


**Tandy Assembly**  
by John Mark Mobley

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The event was October 7-8, 2017.

What follows are some pictures for the event...



TRS-80 Model 1 CRT Display





Peter Cetinski's Display



Alan Hightower's Display



Mike Rowen's Display



Right side of Alan Hightower's Display



John Linville's Display



Jim Brain of RETRO Innovations  
<http://www.go4retro.com/>





Bomb Threat Game by Rick Adams



Crowd Pan Right



VGA CoCo+ Cartridge Slot-to-VGA Prototype  
Get CoCo 3 graphics on a CoCo 1 or CoCo 2  
By: Peter Bartlett of Bartlett Labs  
<http://bartlettlabs.com/>



Ian Mavric  
Melbourne, Australia

<http://ianmav.customer.netSPACE.net.au/trs80/>



Crowd Center



L-R Scott Adams and Lance Micklus  
Scott Adams is now with a company called Clopas.





Cloud-9 Poster

Steve Strowbridge made videos of the event. He was also selling Stuff We All Get (SWAG) shop items like tee shirts and coffee mugs.

Tandy Assembly Videos

Link: <https://tinyurl.com/yak8q82t>

Mike Rowen was selling a cartridge slot prototype board and case for the Tandy Color Computer (CoCo).

Richard Lorbieski of Boyson Tech was repairing computers. He had a soldering station and was able to repair a number of computers.

Peter and Alex Cetinski had a nice display of the Z80 based TRS-80 computers.

Cloud-9 is reworking its RGB-to-VGA converter so soon there will be a new and improved model.

Peter Barlett and Malcom Ramey were demoing hardware enhancements/peripherals for the TRS-80/Tandy computers. They have a circuit board that can replace the TRS-80 Model 1 Expansion Interface (I/E) box, also providing Internet connectivity.

Randy Kindig brought a collection of pocket computers and Model 100 series computers to display.

Jim Brain of Retro Innovations is now offering CoCoMEM Jr, a 512K byte RAM memory upgrade for the CoCo 1, CoCo 2, Dragon 32, and Dragon 64. This upgrade includes a memory management unit. Retro Innovations is also working on a memory upgrade for the CoCo 3.

Ian Mavric was displaying a number of circuit board upgrades and interfaces for the TRS-80 and Tandy computers. Ian tends to use all through-hole components and 1980s-era part numbers on his circuit boards.

Brendan Donahue was displaying his new MC6847 Video Display Generator (VDG) to Video Graphics Array (VGA) converter called the CoCoVGA. It plugs into the Integrated Chip (IC) socket of the VDG and provides an interface and signal to a VGA monitor.

Alan Hightower was displaying a Tandy 1000 HX, Tandy 2000, Tandy 3000 HD, Tandy 4000, and Tandy 5000 MC. He also had some Tandy laptop computers on display.

John Linville of Retro Tinker was selling games on ROM cartridge/Program Paks.

Evan Write demoed his computer games for the TRS-80 and Tandy computers. Evan has developed a cross development tool that will take information about an Interactive Fiction (IF) environment and then create the code for a number of different systems such as TRS-80 and Tandy computers. Evan is a school teacher that understands what is meant by the proverb: "A wise teacher makes learning fun!"

Scott Adams originally of Adventure International and now Clopas (Puzzle Us Adventure!) gave a wonderful talk on Sunday morning. He shared his dream of introducing people to the Bible using new forms of Interactive Fiction (IF).

Michael Brant of Mike's Miscellany had an assortment of Tandy items for sale.

Rick Adams demoed his new Bomb Threat game.

Brett Gordon demoed Fuzix and Yet Another-Disk Operating System (YA-DOS) for the CoCo and answered questions about them.

Brett Gordon's projects:

Link: <https://sites.google.com/site/cocoboot2/home>

George Philips demoed TRSVID, a video player for the Tandy Z80 based computers.

TRSVID:

Link: <http://48k.ca/>

Paul Fiscarelli is making Floppy Disk Tools for the TRS-80 Color Computer. It can read a batch of virtual floppy (dsk) files and create a database of all the files. This is a viewable and searchable database. This database can automatically find duplicate files. Files can be displayed in various formats such as ASCII with semi-graphics, hexadecimal, and perhaps graphics. Files can be executed from the database listing. You just click on the file and the emulator of your choice starts up with the program.

Neil Blanchard demoed a Tandy 1000 TL/2 and a later version with VGA graphics.

Tandy Assembly

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

Tandy Assembly Speakers:

Link: <http://www.tandyassembly.com/speakers.html>

Tandy Assembly Exhibitors:

Link: <http://www.tandyassembly.com/exhibitors.html>

### **The 27<sup>th</sup> Annual "Last" Chicago CoCoFEST!**

by John Mark Mobley

The event is scheduled for April 20-22, 2018. CoCoFEST! is a vintage computer festival featuring the TRS-80 Color Computer, Tandy Color Computer, TRS-80 Micro Color Computer MC-10, and their clones. Other vintage computer systems are welcome. The event is in Lombard, Illinois in the basement of the Heron Point Convention Center next to the Fairfield Inn.

Steps:

- 1) Put CoCoFEST! on your calendar.
- 2) Visit Google Earth and explore the area between the Fairfield Inn and the Heron Point Building.
- 3) If coming from out of town reserve a room at the Fairfield Inn. Call (630) 629-1500 and mention Glenside CoCoFEST! to get the special overnight room rates. \$94 plus 11%, total \$104.34.
- 4) Make your travel plans.
- 5) If you plan to be an exhibitor/vendor then fill out the CoCoFEST! Exhibitors Contract and mail or email it to Tony Podraza.
- 6) If you plan to give a presentation, contact John Linville (better sooner than later!).
- 7) About one month before the show we hope to have a way you can pre-register and perhaps

pre-pay. Visit [glensideccc.com](http://glensideccc.com) for updates as to what is going on.

- 8) Bring some spending money for meals, hardware, software, tee shirts, coffee mugs, and auction items.
- 9) Bring your camera. Bring hardware you want repaired. Bring items you want to sell or donate to the auction.
- 10) Show up at 5:00 pm on Friday April 20, 2018 and get settled in.
- 11) Get walking directions to the Heron Point Building, enter the lobby and notice the metallic sculpture of the heron. It is customary to touch the heron. Then find your way to the stairs or elevator and travel to the basement / lower level of the building. Have a look around.
- 12) Return to the Fairfield Inn and join a small group for supper.
- 13) About 6:30 PM check and see if there is an opportunity to help with early setup. We like to cover the tables with brightly-colored red, green, and blue plastic, and then allow the exhibitors and vendors to set up their displays.
- 14) On Saturday, April 21, 2018 from 7:00 AM to 9 AM, in the basement of the Heron Point Building (Convention Center), exhibitors/vendors have more time for setup.
- 15) At 8:30 AM find the CoCoFEST! registration desk. Check in, verify your email address, pay any money you owe, get your name badge, and sign up for Saturday night supper if you like.
- 16) At 9:00 AM join the group as we stand for the American national anthem as well as the Canadian national anthem.
- 17) Go to lunch around noon.
- 18) Join us for supper around 6:00 PM.
- 19) We have the building until midnight.
- 20) Sunday April 22, 2018 the show reopens at 9:00 AM.
- 21) Go to lunch around noon.
- 22) At about 2:00 PM people will need to start taking down their displays.
- 23) At 5:00 PM we must be cleared out of the Heron Point Building.

We had about 80 people show up to the 2017 CoCoFEST!

For the 2018 CoCoFEST! we are allowing students 21 years old and younger free admission with their valid student ID (does not include dinner). So consider inviting a student that is also a computer enthusiast. This is a wonderful chance to meet others with similar interests. Anyone who is interested in electronics, computers, hardware, software, firmware, hardware description language, digital communications, gaming, digital archeology, history, 3D printing, the maker movement, math or science will have no trouble finding



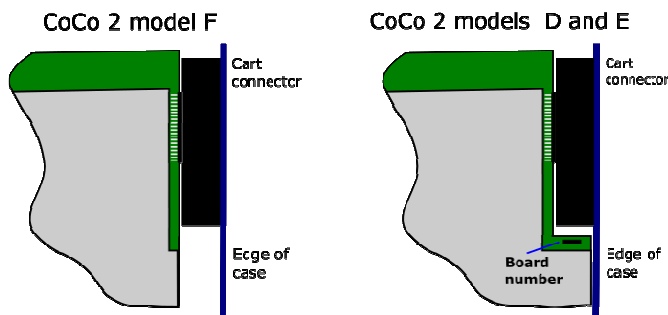
people with similar interests. There are always software and electronics engineers on hand to answer any STEM related questions.



2017 CoCoFEST!

### CoCo Happenings By Salvador Garcia

2017-09-25 Darren A, on the CoCoList, provided a tip to identify the D, E or F series of motherboards in the CoCo 2 without removing the case. He suggested shining a bright light through the vents between the cart connector and the keyboard. If the motherboard extended all the way to the right side of the case then the motherboard was a series D or E. If the motherboard left a gap between it and the case then it was an F series motherboard. See image below.



2017-10-04 On the CoCoList, Arthur Flexser provided a troubleshooting tip when overheating is suspected. He took an ice cube and placed it in a plastic bag. After that, he placed the ice cube on top of the integrated circuit (IC) suspected of overheating. If the computer's behavior did not change, he moved on to the next chip. If the behavior changed then the IC being tested may be the problem.

2017-10-04 Jim, of RETRO Innovations, announces that he is developing a memory board for the Coco 3 that will allow 2, 4, 8 or 16MB of RAM. He is still deciding what configurations to offer. Called the CoCoMEM, this board installs directly on the GIME

PLCC socket without requiring any modification of the CoCo 3's existing circuitry. The dislodged GIME installs in an onboard socket that's on the CoCoMEM.

<http://www.go4retro.com/products/cocomem/>

2017-10-06 Jim, of RETRO Innovations, announces that he is developing a memory board for the Coco 1 and 2, and the Tano Dragon that will provide a CoCo 3 compatible Memory Management Unit (MMU). The memory expansion board, called CoCoMEM Jr., currently supports 2MB of RAM. The board installs in the 6809 socket and the dislodged CPU installs directly on the CoCoMEM Jr.

<http://www.go4retro.com/products/cocomem-jr/>

2017-10-09 Pierre Sarrazin announces the release CMOC 0.1.41. This C-like cross compiler for the CoCo Disk BASIC environment now supports the 32 bit arithmetic "long" type. Check out this CoCo programming language:

<http://sarrazip.com/dev/cmoc.html>

2017-10-09 Monta Elkins posted a link to the Facebook group to a Tandy Assembly video.

<https://www.youtube.com/watch?v=QCp4qe6dGfs>

2017-10-10 Rietveld Rietveld posted a link on the CoCoList to a video featuring vintage computer ads. Make some popcorn, sit back, and enjoy!

<https://www.youtube.com/watch?v=IM1fEwYeJaw>

2017-10-16 Steve S. announced on the CoCoList and Facebook group the creation of a new forum for all computer retro topics. The forum just started and all are invited:

<http://retrofanatic.com/>

2017-10-27 Tim Lindner announced on the CoCoList that he revised the CoCo SDC documentation. New PDF is available here:

<http://www.macmess.org/downloads/CoCo%20SDC%20User%20Guide.pdf>

2017-10-28 Rietveld Rietveld posted a link on the CoCoList to a video that explains the differences of the CoCo disk controller cartridges:

<https://www.youtube.com/watch?v=nU0oEOVIL0k>

2017-11-04 D. Bruce Moore officially released his Forest of Doom game. The game can be purchased at the following link:

<http://fod.gracernote.ca/>

2017-11-09 Joe Schutts announced on the CoCo List that the 83,797 MIDI files that he provided are now available on Guillaume Major's website. A special thanks goes to Joe and Guillaume for making these files available and providing a home for them on the 'net.

<http://www.colorcomputerarchive.com/coco/MIDI/>

2017-11-09 Guillaume Major announced the availability of version 0.40 of his CoCo SDC Explorer for download:

<https://tinyurl.com/y6uzcak7>

2017-11-15 Pere announced on the CoCoList that he released a new version of his Game, SHARK, to correctly play back sounds on a CoCo 3. Go to the second page of the thread and locate "SHARK v37H.ZIP". Link:

<http://archive.worldofdragon.org/phpBB3/viewtopic.php?f=5&t=5638>

2017-11-21 Ron Klein announced on the CoCoList that a new version of his CoCo Pi SD card image for the Raspberry Pi 3 is now available at the following link:

<http://ogsteviestrow.com/coco3/>

2017-12-06 Neil Blanchard announced on the CoCoList and Facebook group that he will be distributing Tim Lindner's Program Pack Boxes in Canada for \$2 CAN. The box is shipped flat and unglued; however, he also has the option for \$5 CAN for a previously folded and glued box.

2017-12-13 Steve Strowbridge announced on the Facebook group his new Cheat Sheet for CoCo owners. Link:

<http://imacoconut.com/start-here/>

## CoCobits: The 6309 Piggyback by Salvador Garcia

Recently, the topic of piggybacking a 6309 to a 6809 came up on the CoCo List. Tim Fadden was looking for something else (CoCo related, of course) and found and posted some notes on how to piggyback a Hitachi 6309 processor on top of an existing Motorola 6809.

Why would anyone want to do this? Many CoCo owners upgrade their computers by replacing the original 6809 with an enhanced 6309. The Hitachi processor is an equivalent replacement for the 6809; however, it also contains some extended features. Software written specifically for the 6309's extended features will not work on a CoCo with a 6809. One of the 6309's enhancements is the optimization of some of its instructions. This means that the 6309 processor is able to execute some instructions in a shorter amount of time than its 6809 brethren.

Replacing the original processor is not an easy task and is daunting for those that have never de-soldered a 40-pin integrated circuit (IC). The piggyback process allows the owner to solder on a (40 pin) socket directly

onto the existing 6809. The process, in summary, consists of snipping one pin from the 6809, snipping off a few pins from the sockets, soldering the socket onto the 6809 and finally making a few connections. The process can optionally provide a switch, or jumper that allows the owner to switch back and forth between processes.

After the process is completed, you now have a dual core CoCo! However, there is a big catch: You can only use one of the cores at a time. Having the switch allows the owner to run 6809 or 6309 specific tests. While this is handy, it does have its downsides, as Richard L. points out. Richard presented a scenario where one of the Central Processing Units (CPU) fails or is damaged during the process. The only fix is to remove them and now we are back to de-soldering a 40 pin IC from the motherboard.

Someone suggested designing a Printed Circuit Board (PCB) that is mounted on the CoCo motherboard, containing two Dual Inline Package (DIP) 40 pin sockets and a switching mechanism to make the upgrade more practical. Although RETRO Innovations had some doubts about why such a board should be available, he kindly designed the board and provided links to download the files that would need to be sent to the PCB manufacturer. He was even open to doing a run if there was enough interest in the board. However, he did warn that his design was untested.

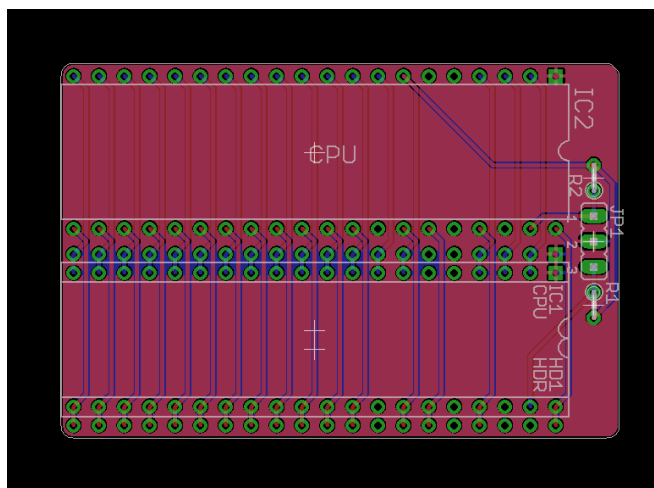
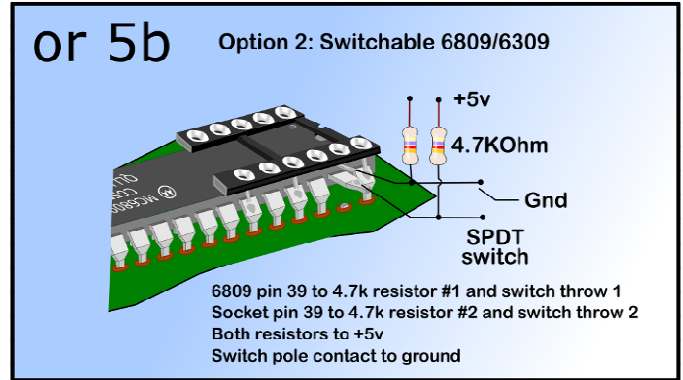
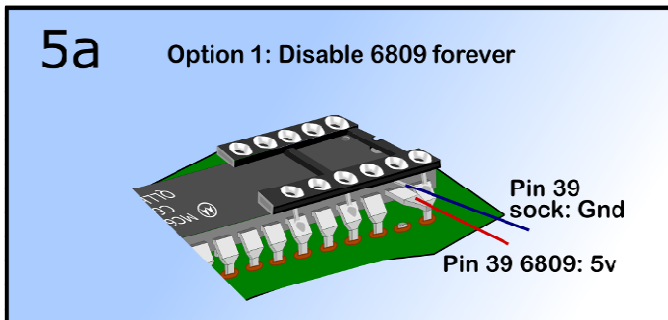
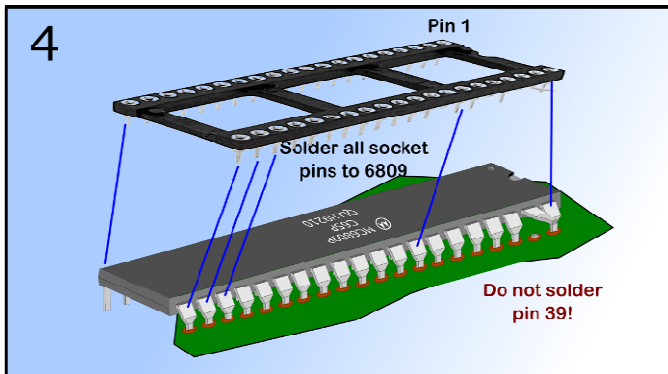
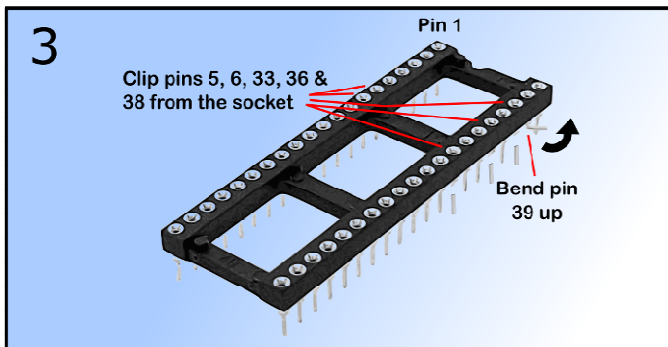
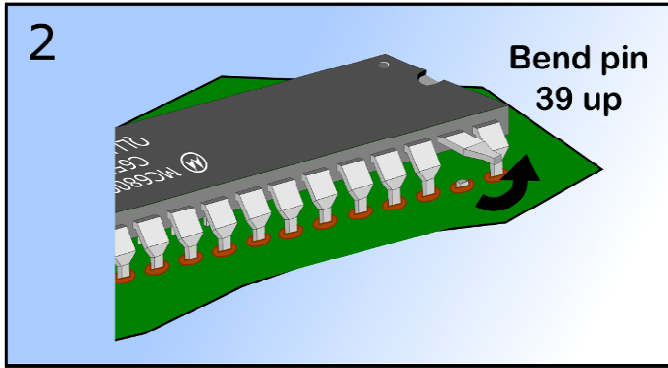
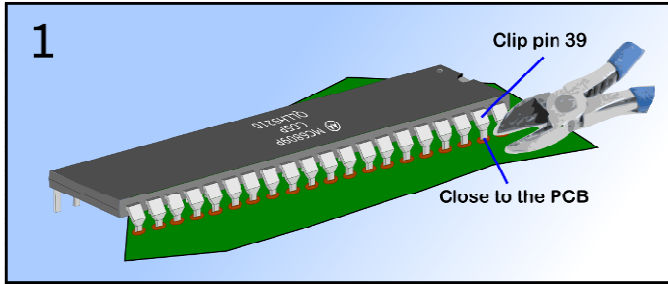


Figure 1 RETRO Innovations' Dual CPU PCB design

Contact RETRO Innovations for any updates regarding a possible run of PCBs. Following are the instructions to piggyback the 6308 on top of the 6809. These instructions, as well as those posted by Tim, assume that a 40-pin socket is used. While this is optional, being able to solder the 6309 directly, the use of a socket is recommended. The socket type recommended is the machine screw type. Enough said, here are the instructions, graphic novel style <g>





Depending on whether the CoCo owner wants to make this change permanent, or have a switchable 6x09 system, either step 5a or 5b is done, but never both! If the switch option is used, it is important to note that the switch can only be toggled when the CoCo is OFF. Please note this as it is the most important note in this content.

Enjoy your dual core CoCo (if you selected option #2).

### Retrojetsonian by Salvador Garcia

I love technology. I am still in awe how, in the palm of my hand, I can hold more computer power than NASA had when they first sent a man to the moon. The technological advances that we have witnessed in the last 40 years have no precedent. Today, we live in an age where we can use technology in every aspect of life, from parking a car to checking the weather in any part of the world.

I would not trade this for anything, but there is something that I miss. When technology was booming in the mid-70s to mid-80s, its complexity was such that a mere mortal could tinker with it. I recall seeing my uncle repair television sets by replacing a resistor, or a vacuum tube. In contrast today, there isn't much that is replaceable inside of today's TVs. Typically, the repair consists of tossing a module and replacing it. Or, in many cases, the entire TV is replaced because the repair is not cost effective. Who wants to pay \$200 USD to fix an LCD TV when s/he can get a new one, possibly of bigger size and with more features, for a few hundred US dollars more?

Computers are no exception. When I was in college, I remember my friends designing an electronic board that blinked LEDs from a Tiny BASIC program running on an S-100 CP/M computer at roughly 4MHz. Today, we have 32/64-bit buses running at Gigahertz speeds. Tinkering with modern technology requires equipment that is much more sophisticated and expensive than what was needed in the 70s and 80s.

And thus, my love for retro digital electronics. I get excited learning something new using a 555. When "74LS00" comes up in a conversation, I know what that

is! I can look at the 6809's 40 pins and know that I can understand what each pin does and how to build a device around it. Not so with an Intel i7 with its 1,000+ pins (which I believe are now called "lands").

So yes, I love retro technology because it presents the opportunity to explore, learn, and to tinker with knowledge that I can acquire and with tools that I can afford. The basic design principles are similar to those of modern technology, but unless we're design engineers that work at a chip or low level facility, we really won't have the ability to tinker with modern-day technology at the component level.

However, this does not mean that we have to totally ignore the present. We can design with retro technology to our hearts' content, but still take advantage of bleeding edge technology to enhance our designs.

This is a technique that is followed by various hardware designers for retro computers. In the CoCo community, we have the 512KB RAM Triad by Cloud 9, or Darren Atkinson's CoCo SDC, among many others. Modern technology has allowed Roger Taylor and Gary Becker to implement a fully functional CoCo 3 using FPGA devices. A combination of modern software and hardware allowed Christopher Hawks to build a CoCo 3 using emulation software on a Raspberry Pi coupled with a clever interface that connected the Pi to an original CoCo 3 keyboard.

It is because of this modern technology that the CoCo and other retro computing platforms have a second go at life and are more useful than they were when they were commercially available.

This innovative group of people are Retrojetsonians; those who have the passion and love for retro computing, but also embrace Jetson era technologies to keep this legacy alive and to enhance its functionality. We can't imagine what the future holds. What will technology look like in 20 or 30 years? Whatever the case, we can be sure that future generations of Retrojetsonians will take up the challenge of preserving and enhancing the legacy that these historical computers left behind. The current crop of devices and products available have allowed us to enhance our collection of vintage computers to levels that were unthought-of, or prohibitively expensive, when these computers initially came out. A toast, and a big thank you, to all those Retrojetsonians out there!

## I Want my CoCo TV!

by Salvador Garcia

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Lately, there has been mention of CoCo TV. What is this? Basically, it is a video streaming channel started by Roger Taylor. The channel can be watched on almost any modern TV; however, some extra hardware is required. Roger decided to use the Roku streaming service to "broadcast" his CoCo TV channel.

Roku is a company that was founded in 2002 specifically to provide streaming services. The service is provided through a Roku Player. This is a device that connects to the TV and gets its streaming content from the Internet. This means, that besides needing the Roku Player hardware, you'll also need a reliable and fast Internet connection to get your fill of CoCo TV..

The streaming service is available internationally in many countries; therefore, living outside the United States is not automatically a hindrance for this specific service. Some TV manufacturers include the Roku player along with other apps (Hulu, Netflix, etc.) It's recommended that you check your TV's apps to determine whether you can get the CoCo TV channel now or whether you need to purchase the Roku Player.

Roku players are not expensive. There are different models of the Roku Player starting at \$30 USD and creeping up to \$100 USD, depending on the features and options available. If shopping for a new TV, and this service interests you, it is worth checking out which TVs have Roku integrated into them.

A customized version of Linux is at the heart of the Roku Player's software. The player connects to the TV via its HDMI or composite jacks, although not all models support composite. To connect to the internet, all models support WiFi. Out of the box, the Roku Player supports a diverse number of free channels, among them the primary TV networks, for example, in the U.S., ABC, NBC and CBS. CoCo TV is not automatically included. To get Roger's CoCo TV, go to the following page:

<https://channelstore.roku.com/details/188170/coco-tv>

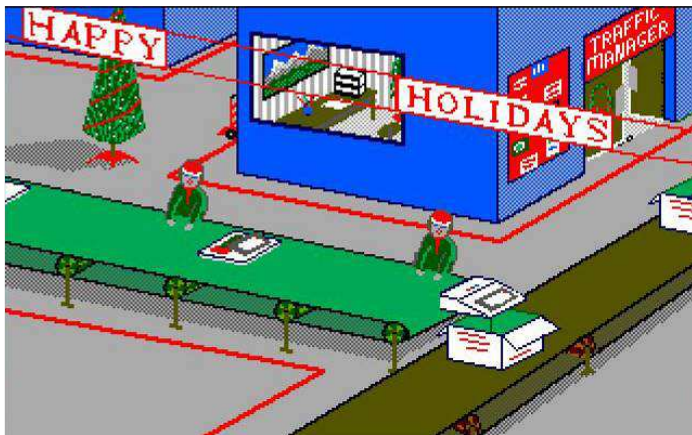


While some add-on channels for Roku require a fee, CoCo TV is totally free of charge. Thanks Roger! Note that to add CoCo TV to your Roku setup you need to have a Roku account.

The Roku Website presents all the information necessary to understand what this device is, the hardware, the TV models that include the player, setup instructions, and information on where to get the Roku Player.

<https://www.roku.com>

**Merry Christmas**  
by John Mark Mobley





## Calendar of Events

by John Mark Mobley and Salvador Garcia

See our website's Calendar of Events:

<http://www.glensideccc.com/calendar/index.shtml>

Glenside Color Computer Club, Inc. Business Meetings

Thursdays, Jan 11 and Feb 8, 2017

7:30 PM to 9:30 PM Central Time

Schaumburg Public Library

130 South Roselle Road

Schaumburg, IL, USA

Google Hangouts access is available via John Mark Mobley or John Linville.

Saturday and Sunday February 10-11, 2018

Vintage Computer Festival Pacific-Northwest

Seattle, Washington, USA

Link: <https://tinyurl.com/ycwjphty>

Playthrough Gaming Convention 2018

Raleigh Convention Center

Raleigh, North Carolina, USA

Link: <https://tinyurl.com/ybc9mzn8>

DuPage Area IIT STEM Expo 2018

IIT Rice Campus

Wheaton IL, USA

Link: <https://tinyurl.com/yclfhnwf>

The 27th Annual "Last" Chicago CoCoFEST!

Tandy Color Computer Festival

Heron Point Building

Lombard, IL, USA

Link: <https://tinyurl.com/y8zrdyw4>

KansasFest

Apple II Computer Festival

Rockhurst University

Kansas City, Missouri, USA

Link: <https://www.kansasfest.org/>

## Community Recognition

The Color Computer community is a dynamic and vibrant entity with people who go above and beyond to bring us new software, games, and hardware accessories. Some go loudly into the night providing news, talks and interviews to keep the community informed and motivated.

The Glenside Color Computer Clubs recognizes this and is proud to present a small and humble acknowledgement those who help make this a successful and motivated community.

The acknowledgement is a small trophy awarded to those who in some way have stood out through their achievements in excellence towards our community.

## The 27<sup>th</sup> Annual "Last" Chicago CoCoFEST!



### CoCoFUSION

Here are the 5 "W's"

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

**WHAT?** 2) The 27th Annual "Last" Chicago CoCoFEST!

**WHEN?** 3) April 21 & 22, 2018

(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 2017!)

**Overnight room rate:**

\$94.00 plus 11% tax (\$104.34 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: \$15.00 1st - \$5.00 2nd & more

Sunday Only: \$10.00 1st - \$5.00 2nd & more

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

\*\*\*\*\* Students 21 and under with valid student id - 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](mailto:tonypodraza@gmail.com) [rswoger@aol.com](mailto:rswoger@aol.com)

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