



## CoCo ~ 123 Memory Map

### Routines

### Address

GCCC Officers .....	1
GCCC Information .....	2
GCCC Contributions .....	2
Contributors to this Issue .....	2
GCCC Meetings .....	2
From the President's Platen .....	2
Treasury Notes .....	2
Secretary's Notebook .....	2
Editor's Clipboard .....	3
ARTICLES .....	3
CoCo3/HDB DOS/NitROS9 Adventures Part 1 .....	4
The 23 <sup>rd</sup> ANNUAL "Last" Chicago CoCoFEST! .....	5
BASIC-to-Forth .....	13
5.25 floppy-to-USB .....	16
OS-9 on the Raspberry PI.....	17
Yet-Another-DOS (YA-DOS).....	17
Invader09.....	17
Invader's Revenge (VADREV).....	18
CCEDIT.....	18
Low Budget Trip to CoCoFEST 2015.....	18
CCEDIT Doubleback 2015.....	21
CoCoFEST! 2014 Information - The 5 "W's".....	22
Calendar of Events .....	22

### Upcoming Events:

The 24<sup>th</sup> Annual "Last" Chicago CoCoFEST! **April 25-26, 2015**  
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	630-837-7957	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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Tony Podraza



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 Glenside Treasurer:

George L Schneeweiss  
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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## CONTRIBUTORS TO THIS ISSUE

Richard Bair  
Brett Gordon  
Allen Huffman  
Kip Koon  
John Mark Mobley  
Tony Podraza  
George Schneeweiss  
Robert Swoger  
Gordon Young

## 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, lovingly called, "The Meeting After".

## FROM THE PRESIDENT'S PLATEN

Phil may have lied (Punxsutawney Phil, that is). We are getting cold weather and snow all around the country in lows and quantities like we have not seen in recent memory...which reminds me that Glenside gave away engraved 16GB "keys to I.T." at the CoCoFEST! in April of last year. We need to clean them out of our hands and get them into yours. If you would like to receive one, send \$10.00 to George Schneeweiss, our treasurer, or to me, and your address to me. I will mail you the 16GB USB 2.0 Memory "key" when either George or I verifies receipt of your check. We have used PayPal and that seems to work, with a service fee for what they deduct. If you would like to use that medium, contact me. We will see what we can do.

As of today, we have about 36 days until the upcoming 24th Annual "LAST" Chicago CoCoFEST!. Details can be found on the Glenside website and/or elsewhere in

this newsletter. However, we only have 2 exhibitors expressing their intent to attend.

I know there are more waiting to do so, but we need time to plan where in the room to put all of you. So, please, get those cards and letters coming in, folks...SOON.

This will be the last year for Heron Point. The new management has upped the cost from what we have enjoyed in the past two years by five fold. We are absorbing the increase, but will have to re-think the financing for next year. Keep us in your thoughts for that undertaking. We are starting to look, now, for a place for next year. We have always attempted to keep costs down as best we could, that is still our goal. Also, we are having to change the show's hours this year.

No one may enter the building before 7:00 AM. The general opening will be @ 9:00 AM and WE MUST BE OUT OF THE ROOM BEFORE FIVE O'CLOCK, SUNDAY, or face substantial surcharges. And I mean out... not just shutting down. Please plan accordingly. If you want to work on stuff back in the rooms, start packing up @ 4:30 pm on Saturday. There is room for discussions, etc., in the hotel lobby and breakfast area. We will shut the show down @ 4:00 on Sunday. We might want to start organizing the clean up around 3:45 on Sunday. We will have a "family dinner" this year, again on Saturday night. @ 6:00 PM We would like to have an idea of how many will be coming to dinner to better inform the restaurant, wherever it may be, so they can be better prepared. We goofed up with the numbers last year, and the results were very bad. Remember, the doors lock at 5:00. We MUST BE PACKED, CLEARED OUT, and TIDY-UPPED.

Now, to make up for the extra effort, we will be having a show-closing dinner Sunday at the semi-local Fuddruckers prior to final dispersal, if you can join us. Target time is 5:30. They are a family hamburger and ground meat (varies in season) restaurant. Chicken also available. No pizza, sorry. Hope you can join us.

The excitement is building. I hope that I can contain myself.

Until then.... I bid you Peace.

Tony Podraza, President  
Glenside Color Computer Club

## TREASURY NOTES

We have \$6020.34 in checking. We have 88 paid members in 2014, down from 136 in 2011, and a total of 431 members to whom we send newsletters.

George Schneeweiss, Treas\$urer  
Glenside Color Computer Club

## THE SECRETARY'S NOTEBOOK

Our library now stands at 636 disks and disk images. We were unable to continue the copy from floppy to CD operation to increase that number at the picnic on September 20 in Forrest, Illinois.

**LogiCall** can be updated at any time from:

<https://dl.dropboxusercontent.com/u/55520144/LogiCoCo.ZIP>



From: **Allen Huffman**

Thank you for the submissions -- I will get the latest one up on the page soon, and post more updates.

The winner is going to get either a CoCo SDC + 8GB SanDisk SD card + enclosure, OR \$50 [Amazon.com](https://www.amazon.com) gift card.

From: **Gordon Young**

I'm hoping you can help I'm looking to buy a vgc boxed Timex Sinclair TS2068, my problem in obtaining one (they're not that rare) is that I live in the UK, every time I see one of these machines on eBay the seller does not want to post to the UK.

In my collection at present I have an un-built ZX81 kit, 48k ZX Spectrum, 48k ZX Spectrum with a DK'Tronics keyboard, Timex/Sinclair TS1500 with TS2020 datacoder cased, Sinclair QL, Spectrum +2 and a Spectrum +3.

So you can see why I'm so keen to get a Timex/Sinclair TS2068.

Anyway thanks for your time and any info you can give will be appreciated.

Bob Swoger, Secretary - [rswoger@aol.com](mailto:rswoger@aol.com)  
Glenside Color Computer Club

## THE EDITOR'S CLIPBOARD

Please send me pictures of the 2015 CoCoFEST! Please send me your fest reports.

John Mark Mobley, Editor  
Glenside Color Computer Club

## Dartmouth Time Sharing System Simulator BASIC Programming Contest by Kip Koon

The BASIC computer programming language was first brought up on May 1, 1964 on a Dual GE-235 mainframe computer at Dartmouth College in close association with General Electric Corporation. So May 1, 2015 will be the 51<sup>st</sup> birthday of the creation of the BASIC language this year. In celebration of this monumental event, I have updated the CoCoFEST 2015 Events page with an announcement of the Dartmouth Time Sharing System (DTSS) Simulator BASIC Programming Contest.

As I do not know what time the Contest will commence, I expect it will start sometime in the morning since time is short at the CoCoFEST! this year. If you have any ideas on how to make this contest the best it can be, please let me know. All positive suggestions are most welcome. I have sent out an announcement about the DTSS BASIC Programming Contest to several retro computer email lists including The Altair Computer Club, Reddit, The Chicago Classic Computer Club, Retro Restore, TRS-80 MC10, Vintage Computer Festival and the N8VEM email lists.

I have only received one official entry, from John Mark Mobley. I know Jim Gerrie has been working on an idea, but to my knowledge no other entries have been made yet. I will be getting back with Jim to see how he is coming along with his program. If you wish to participate with us in this contest, please get your entry in as quick as possible. The CoCoFEST is only 1 month away! You do not have to be present to win.

Even if you have no knowledge of what a Color Computer from Radio Shack is, you may participate. We are celebrating the birth of the BASIC language itself! The BASIC language as a fast compiler was first implemented on a dual GE-235 mainframe computer, since microcomputers as we know them did not exist yet! Yes, it was a full-fledged compiler from its very inception! From the very beginning BASIC was meant to be a full procedural computer programming language just like any other major compiler-style programming language of its time.

It was also run on Digital Equipment Corp.'s PDP-8 and PDP-11 series machines among many others, I would expect. Come join us in celebrating one of the world's most recognized computer programming languages ever created. A language for the people to use to program computers without having the become computer programmers themselves. This was John Kemeny and Tom Kurtz's vision, to bring computer programming to those people who needed to run calculations for their particular degrees without having to become computer programming students to do it. I think they did a wonderful job! Come, join in and celebrate with us. Take care my friends, see you at the fest.

Kip Koon, [computerdoc@sc.rr.com](mailto:computerdoc@sc.rr.com)  
[http://www.cocopedia.com/wiki/index.php/Kip\\_Koon](http://www.cocopedia.com/wiki/index.php/Kip_Koon)

## 1980 4K CoCo Programming Challenge by Allen Huffman

Let's pretend it is July (or August, depending on which source you use) 1980, and you wandered in to a Radio Shack store and saw the brand new TRS-80 Color Computer. Unlike the TRS-80 Model I, this machine had color and sound built in, and used a normal color television for the display just like an Atari 2600.

You quickly plopped down \$399 (plus tax) to buy your very own Color Computer, plus spent a little more for a cable that let you hook up a cassette recorder to load

and save programs to cassette tapes. If they were available, you may have even opted for a pair of joysticks.

You got home, hooked the machine up to your television, and powered up the machine to be greeted with COLOR BASIC 1.0. You had 4K of RAM available to begin writing your first program. What could you have written?

### **Contest Concept**

---

The goal here is to write something as if you were using the original 1980 CoCo. There was no Extended Color BASIC, and you couldn't afford to upgrade the memory past 4K. You only have a cassette recorder for storage. (If someone really wants to, I suppose they could write a Program Pak entry, as a different category, allowing them to have 8K or 16K of code in ROM, using only 4K of RAM.) We should probably split the contest into two categories: BASIC and MACHINE LANGUAGE.

Also, we may wish to consider how the program was written. NATIVE (actually on a 4K CoCo or emulated 4K CoCo) versus EXPANDED (written on a later CoCo or later emulated CoCo) or CROSS HOSTED (written using tools on a different computer). The reason I mention this is because it's not possible to run native EDTASM on a 4K CoCo, so any assembly language would have had to be hand-coded (bonus points for doing it that way, just like they had to in 1980).

Using a 16K or 32K CoCo to run EDTASM makes things easier. Doing it using a PC-hosted compiler changes things further.

At the very least, we should note how the program was developed:

- Native - programmed on a 4K CoCo
- Expanded - programmed on a larger CoCo
- Cross Hosted - programmed on a non-CoCo

I suppose we can also note:

- Real - done on a real, physical CoCo
- Emulated - done on a virtual CoCo

A Native/Real attempt would be much more "legit" in 1980 compared to a Cross Hosted/Emulated attempt, though the focus is the end result.

What could you have done in 1980?

For more details and status, visit [www.cocopedia.com](http://www.cocopedia.com). There you will also find instructions on how to emulate a 4K CoCo using the Xroar emulator on a PC, Mac or Linux machine.

There is a new CoCo Coding Contest. See link below for more details.

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[http://www.cocopedia.com/wiki/index.php/CoCoCoding\\_1980\\_Contest](http://www.cocopedia.com/wiki/index.php/CoCoCoding_1980_Contest)

It happens every five or six years: the urge becomes irresistible to make some type of upgrade to my CoCo. This is in direct violation of the maxim "If it ain't broke, don't fix it!", and disregards the fact that giving in to the urge inevitably leads to a prolonged period of frustrating effort which is only slightly less pleasant than beating myself on the head with a 2 x 4. Anyway, it happened again.

This time, the situation was as follows: The CoCo had been working OK for several years, and I enjoyed the fact that it had built-in Glenside IDE and floppy drive cards with a CF "hard drive". But as I got more and more accustomed to the luxury of working from/to the hard drive, the fact that I still had to boot OS9 from a floppy started to rankle. The possibility of a floppy-less boot via HDB-DOS was sounding more enticing by the day. Also, the discovery that the old Glenside OS9 IDE drivers that managed the hard drive wasted half the space by writing only every other byte in each sector began to bother me, even though I never filled more than 3% of what was available. Funny how that is. Learning that the Cloud-9 "SuperDriver" package could correctly address IDE master AND slave drives AND SCSI was tempting, too. And finally, I thought maybe it was time to upgrade to NitrOS9 from the well-patched OS9 version that had served me so well.

Step 1 was to contact Mark Marlette of Cloud 9 to see if he could make me an HDB-DOS EPROM. He needed to know a few things about my computer, including how large I planned to have my OS9 partition be on the hard drive, but I was prepared with my answers and he came up with an EPROM in a flash (pun intended). (The OS9 partition sits at the "bottom" of the hard drive, so RGB-DOS needs to know the OS9 size in order to know how far "up" to put its own 256 non-OS9 disk images.) Thank you Mark.

Step 2 was to download the NitrOS files from their website. There was a choice of versions there, and I opted for the latest 3.2.9, even though it's sort of "beta". I don't do DriveWire, so this meant web > PC\_harddrive > PC\_floppy > CoCo\_floppy, but this was accomplished with only one small glitch with the help of an OS9-68K machine. My CoCo has a 3 1/2" DD drive as drive 1, so all the NitrOS files did fit on just one of those floppies. The glitch was that my drive 1, and all the floppies it creates, are identified as "dns=03" in dmode, whereas the NitrOS disk image was identified in its disk ID sector as "dns=01" even though it was 80-track. So I had to remember to dmode my descriptor back and forth every time I changed disks, otherwise the drive would try to double-step between tracks and get all confused. Since then I've found out how useful "ded" is and I could have fixed that disk in a blink, but I hadn't learned that skill yet.

So Step 3: Put in the HDB-DOS EPROM and see what happens. VOILA, it boots! But I will miss the colorful

non-green 40-column boot-up screen I've been seeing in ADOS for the last 20 years. And will I be able to read from any of my 40-track ADOS floppies? And my powerful inventory-control program which uses almost every byte of the (formerly) 128K of RAM and which is one of my primary uses for the CoCo, refuses to run under HDB-DOS. And, DANG, the head-banging-on-DOS-command which ADOS fixed 20 years ago is back! Time to sit back and reconsider.

Quite a few days passed while I mulled over my complaints about HDB-DOS, but I adjusted my thinking about the four "issues" this way:

1. The plain-Jane bootup screen, I decided after some planning, was not a problem because of the feature of HDB-DOS that it will run a drive 0 autoexec file automatically on bootup. This autoexec program could be simply a WIDTHxx and PALETTEyy,zz command, or something more elaborate like a menu program such as Logically. Either way, by taking advantage of this feature I wouldn't have to be greeted by the (to me) ugly 32-column green screen.

2. Regarding the partial incompatibility between HDB-DOS and ADOS disks, I had never used the capability of ADOS to utilize the "flip" side of floppies, but I had taken advantage of its 40-track capability. However, upon investigation I found that none of my ADOS floppies (there weren't that many) were filled past the 35th track, so all of the data was accessible in HDB-DOS. So scratch that "issue".

3. My inventory-control program won't run under HDB-DOS. The problem is that it's just too big. For now I'm settling for a "workaround". My CoCo3 only sees the internal HDB-DOS ROM if I hold a button down at startup, otherwise it boots in ECB. But I've put my ADOS EPROM into a cartridge case, so if I turn on the computer with that cartridge plugged in and don't push the button, it boots into ADOS. Alternatively, I could have an autoexec program on one of the HDB-DOS virtual floppies that would replace HDB-DOS with ADOS in RAM. Either of those ways I will still have to use real floppies for my inventory data, but at least I'm not dead in the water. Someday I may tackle paring down the size of the inventory program to where it will run under HDB-DOS. So issue 3 is more-or-less settled.

4. Head-banging-on-DOS-command is very annoying to me and was one of my reasons for getting ADOS twenty years ago. I'm surprised that HDB-DOS doesn't fix this old problem, but since my main goal is to boot NitrOS9 from virtual floppies, I decided that this defect is of diminished importance. The few times I need to do an OS boot from a real floppy I'll just grit my teeth.

So with these four HDB-DOS issues addressed (more or less), I proceeded to tackle creating a NitrOS9 boot disk. It's simple, right? Format a floppy, make a bootlist, then os9gen the floppy with that bootlist and copy the floppy to a virtual HDB-DOS drive. With a dd descriptor that references the hard drive, you don't even need to put any other files on the floppy.

The NitrOS distribution disks come with a helpful "master" bootlist that lists all of the modules available on the disk, as well as some that are available elsewhere. If you don't want a particular module in your bootfile, just insert a \* at the beginning of its line and os9gen will pass over it. If a line has a \* at the beginning but you want that module, just delete the \*. Seems simple.

A few details began to complicate the issue. Because my internal CF "hard drive", which is addressed at \$FF50, is partitioned for RGB-DOS (as well as for another OS9 partition above that) the h0 descriptor must have the correct CHS parameters in order for format to create the partition to the desired size. Also, a bit in the descriptor has to be cleared to tell format not to query the drive for size info but use the descriptor values. But I also want to be able to use an external IDE board at \$FF70, so descriptors for drives connected there must be created having different names, such as z0x, cd0x, etc. I spent considerable time creating those descriptors, getting familiar along the way with tools such as ded and moded, but finally I felt I was ready to create MY bootlist.

Looking at the "master" bootlist and imagining all the capabilities my CoCo could have, I was like a kid in the candy store: "I want this, and this, and this....." So pretty soon, I had a bootlist for my super-duper CoCo that would have it doing everything but bake bread.

Trouble is, it wouldn't boot. "NitrOS9 boot failed"

To be continued.

Rich can be contacted at [mgdoc1@sbcglobal.net](mailto:mgdoc1@sbcglobal.net)

### **The 23rd Annual "Last" Chicago CoCoFEST! by Bob Swoger**

Our last issue had plenty of information about what was going on at our 2014 CoCoFEST! but that was only half of it. We spend so much of our time at meetings during the year that it seems appropriate to show more of what went on at the fest. We do have a great time putting it on. This half is about the socializing that goes on much of the time. Check out all the interesting faces.

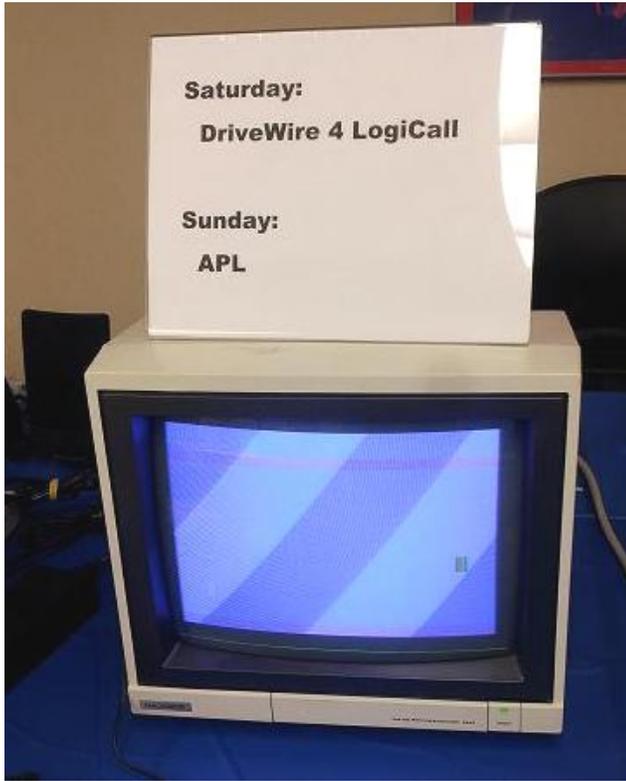
And now scenes you would have seen had you been to last year's fest.



Nice to be welcomed!



Cloud-9's table



Part of John Mark Mobley's display



Items up for auction



Where'd everybody go?



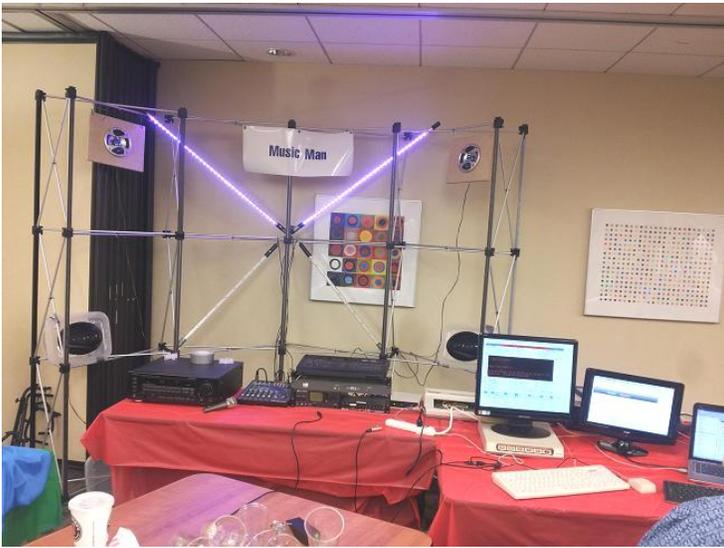
Competition for The Music Man



Brian is making music.



The IDE Project



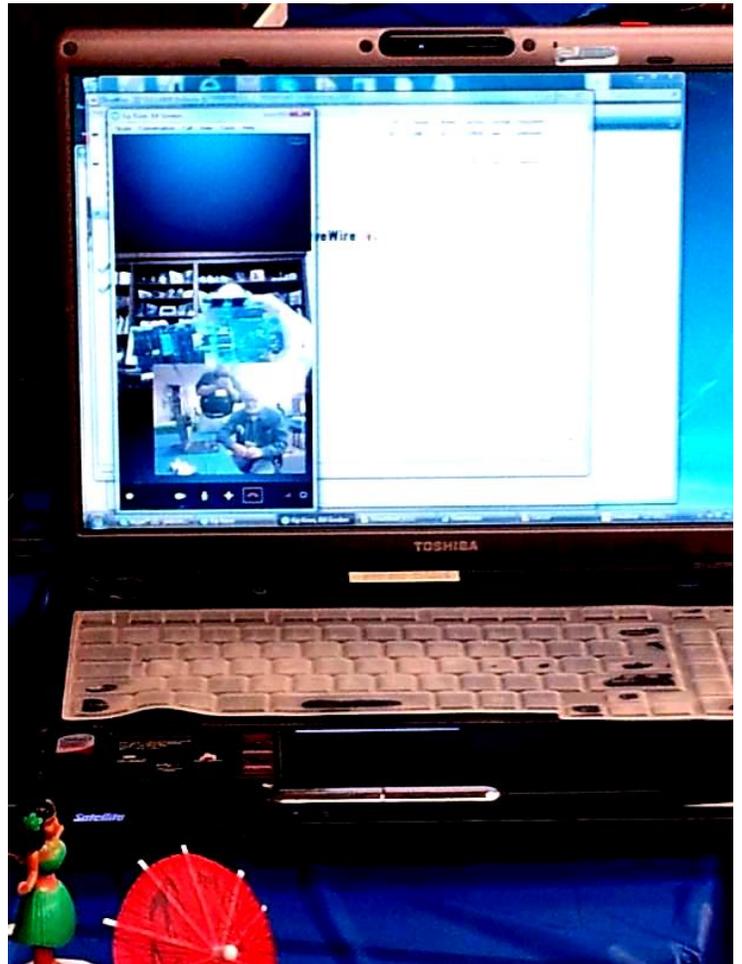
More of Brian's display



Tony would like to interest you in an IDE board & drive.



Annette & Brenda are having a blast!



Kip Koon attends the FEST! virtually on Skype.



Richard Crislip chats on Skype with Kip Koon



HAWKSoft display



More HAWKSoft stuff



Dan Keller – Project Destiny Studios



A CoCoFEST! table



Beautiful handcrafted jewelry



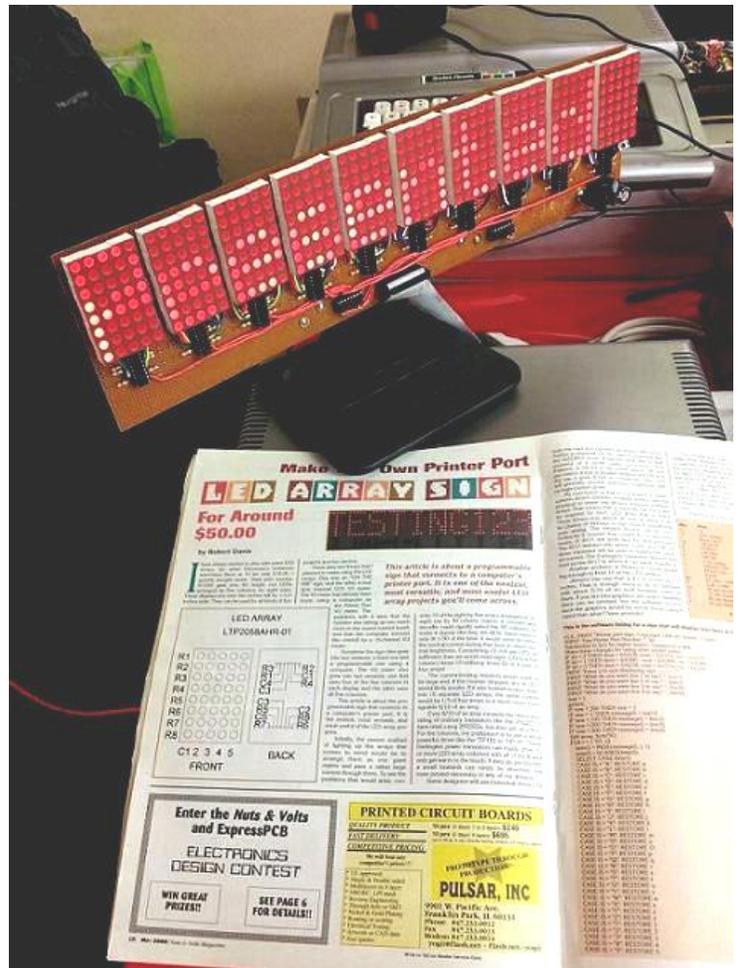
Linda Podraza's wares for sale



Cloud-9 SuperIDE board



Self-explanatory – 'nuff said!



LED array sign demo

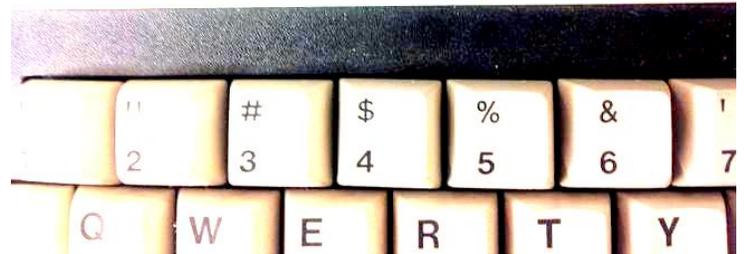


The laser show



Cloud-9's Triad on display

TANDY COLOR COMPUTER 4



The Dream Machine!



Another triad



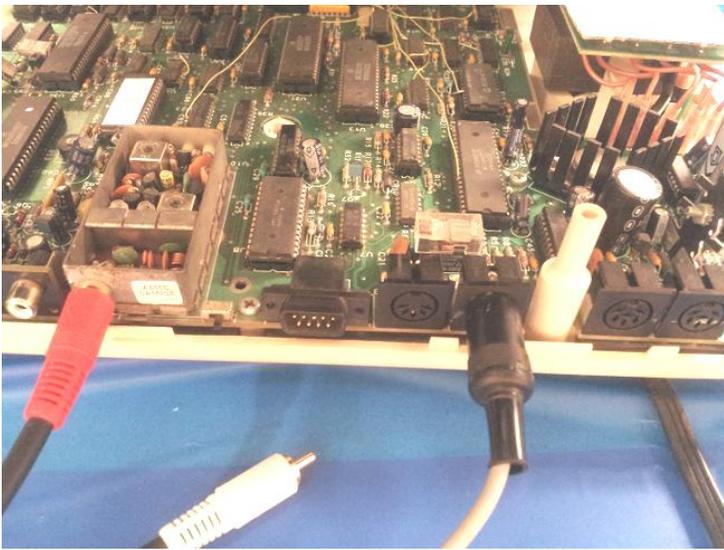
A mother of a board...



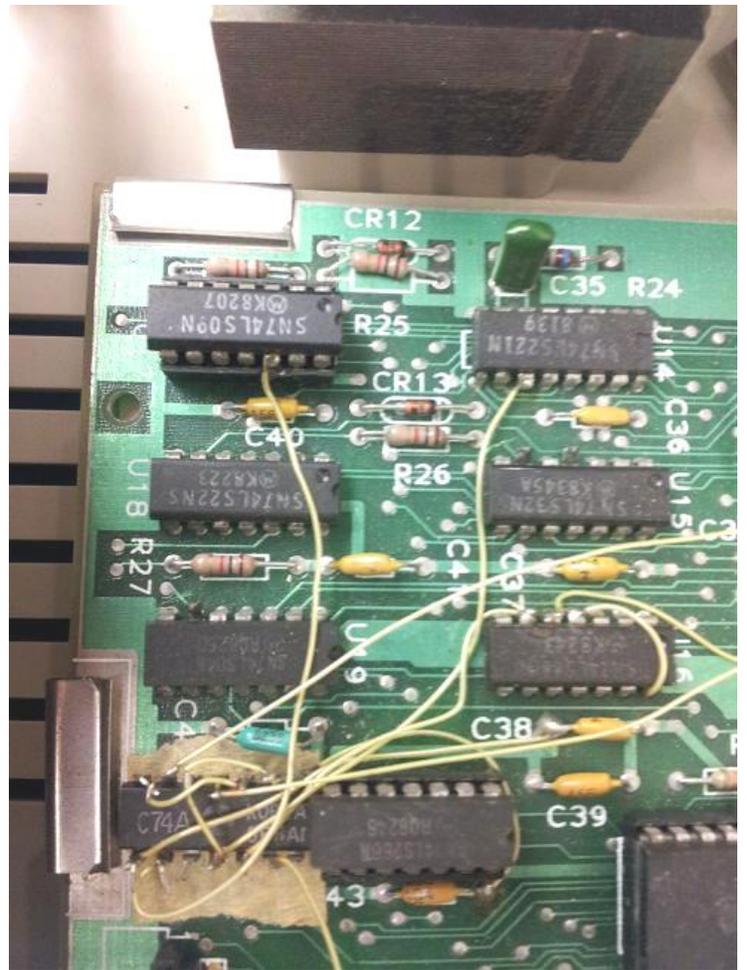
What a CoCo 4 would look like



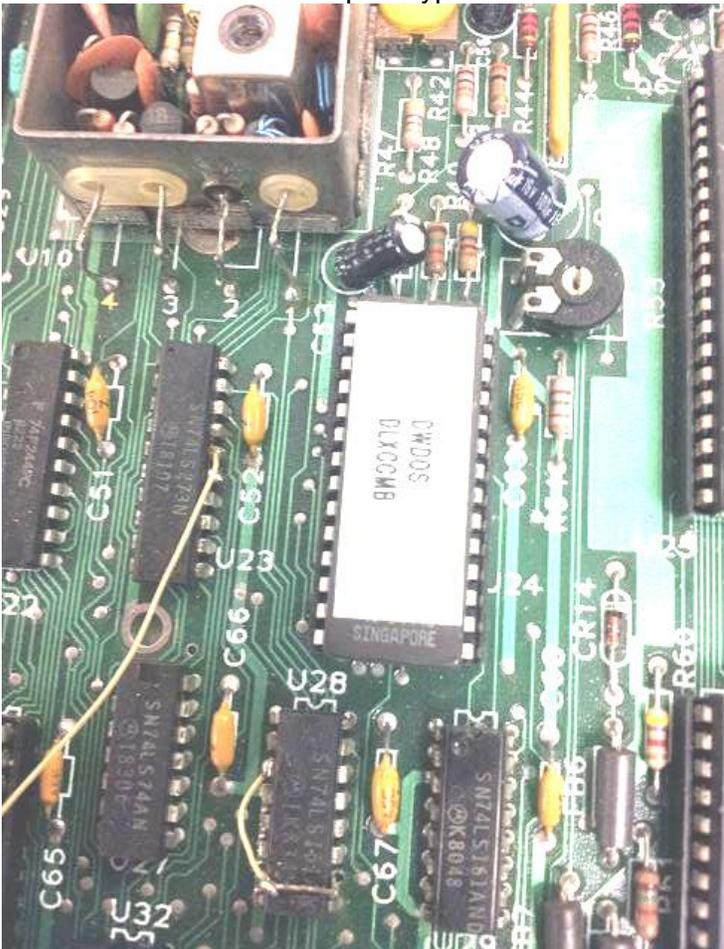
Motorola 6809



CoCo prototype



CoCo prototype



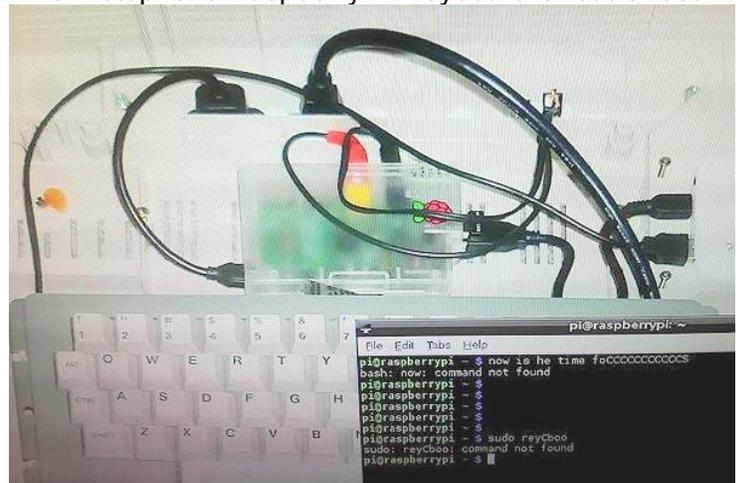
CoCo prototype



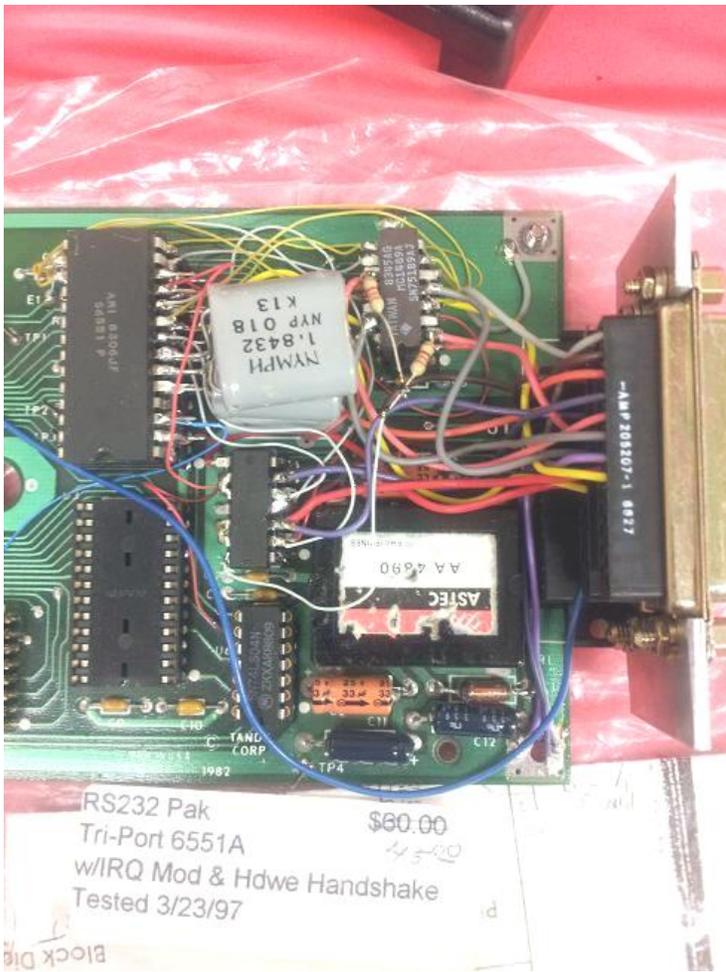
Christopher's Raspberry Pi Keyboard Cheat Sheet



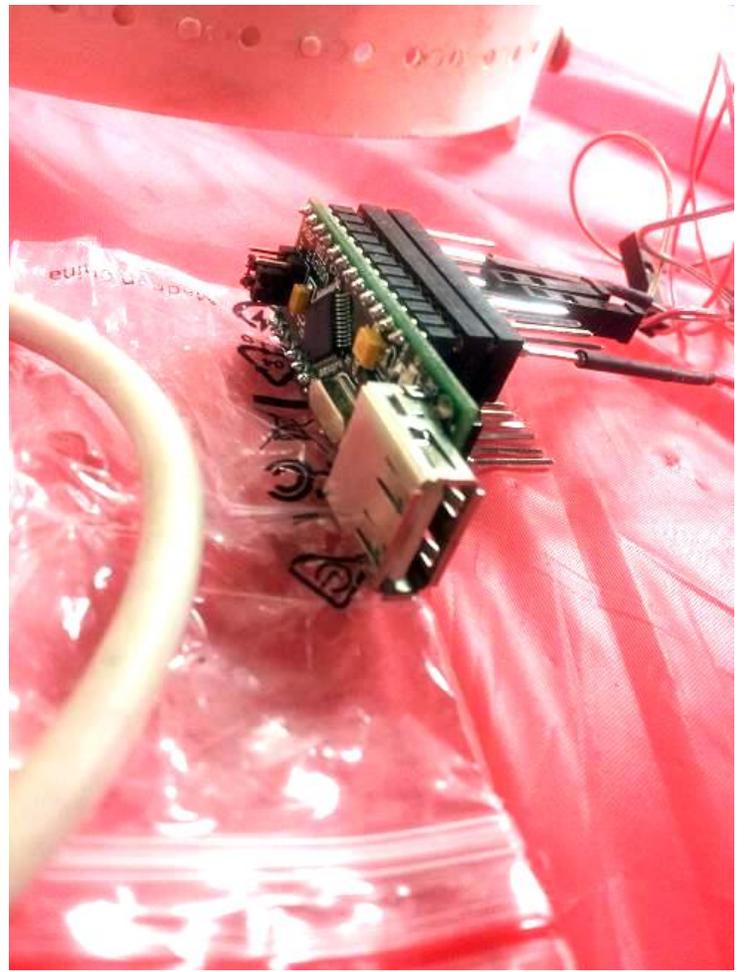
The Family Portrait



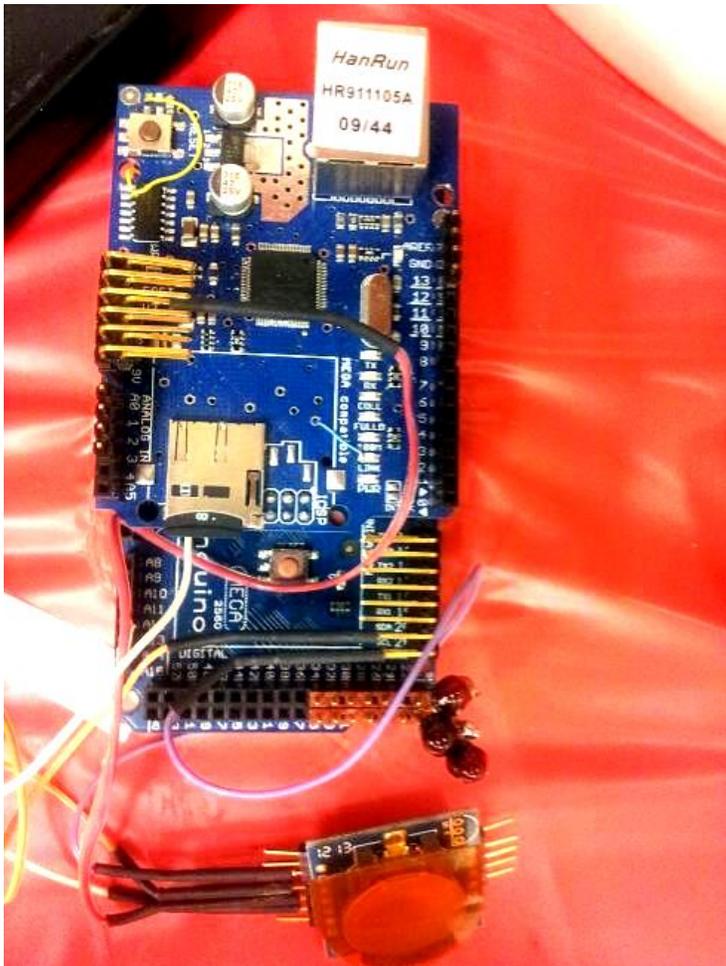
Christopher's Raspberry Pi setup



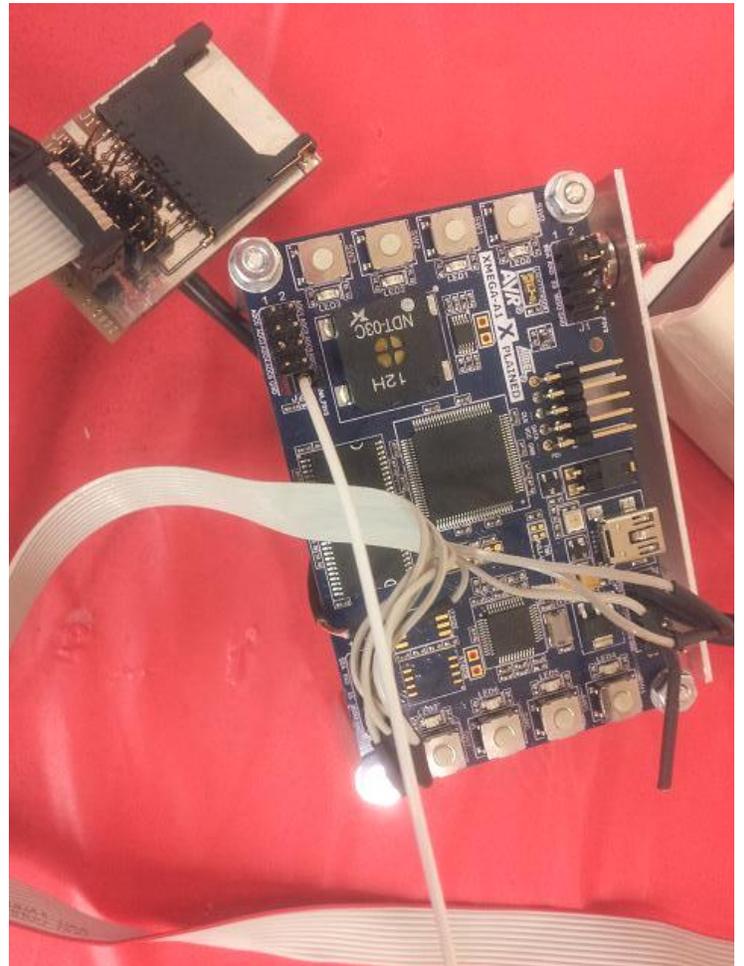
RS232 Pak



Microcontroller board



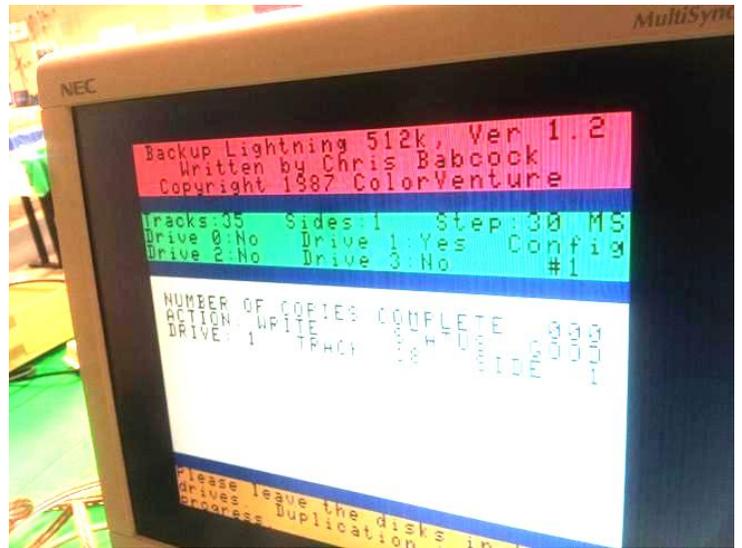
Arduino board



AVR X-MEGA microcontroller



Sands of Egypt



Backup Lightning

**BASIC-to-Forth**  
by John Mark Mobley

GNU stand for GNU Not UNIX. GNU is a recursive acronym. I have been working with Color Forth and Gforth (GNU Forth). Below are some examples of BASIC and Forth code that each do the same thing. If you know BASIC then you can follow the Forth examples and understand how it works.

There is often more than one way to accomplish something in Forth. In Forth you can use a stack value in place of a variable. However, I have chosen to use variables so that you can better follow the BASIC code examples.

Forth works much like a Reverse Polish Notation (RPN) calculator.

The examples below all yield 3.

Prefix notation: + 1 2

Infix notation: 1 + 2

Postfix notation 1 2 +

Prefix notation is also known as Polish notation.

Postfix notation is also known as Reverse Polish Notation.

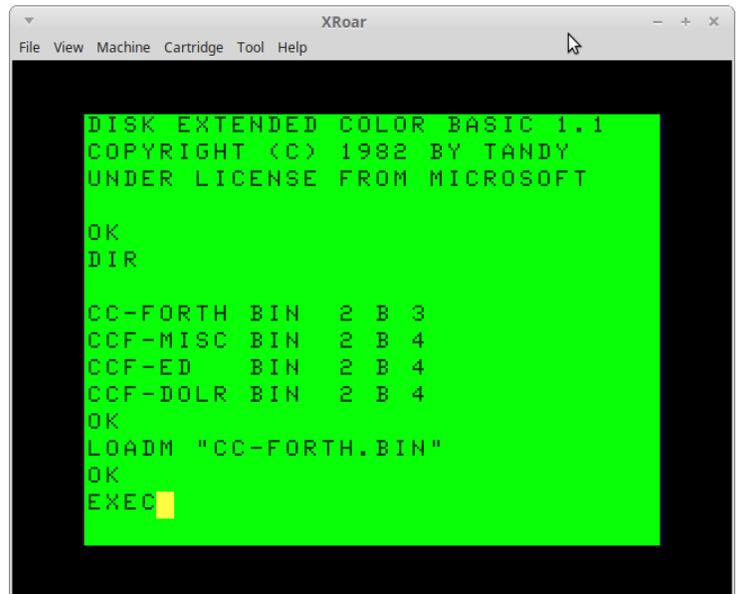
Color Forth does integer math and is reported to run 10 times faster than Extended Color BASIC.



Spit-N-Image – a utility for copying copy-protected files



Copies, anyone?



Load and execute Color Forth

```

XRoar
File View Machine Cartridge Tool Help

DIR

CC-FORTH BIN 2 B 3
CCF-MISC BIN 2 B 4
CCF-ED BIN 2 B 4
CCF-DOLR BIN 2 B 4
OK
LOADM "CC-FORTH.BIN"
OK
EXEC

COLORFORTH 1.1
COPYRIGHT 1981 TJZ & RJT
UPDATED FOR DECB, JAN 2015, SMP

```

Color Forth

Now let's add the miscellaneous extensions.

```

XRoar
File View Machine Cartridge Tool Help

CC-FORTH BIN 2 B 3
CCF-MISC BIN 2 B 4
CCF-ED BIN 2 B 4
CCF-DOLR BIN 2 B 4
OK
LOADM "CC-FORTH"
OK
EXEC

COLORFORTH 1.1
COPYRIGHT 1981 TJZ & RJT
UPDATED FOR DECB, JAN 2015, SMP

LSCR CCF-MISC OK
4 3 2 1 LOAD LOAD LOAD LOAD OK

```

I typed "LSCR<CR>CCF-MISC<CR>"  
 Then I typed "4 3 2 1 LOAD LOAD LOAD LOAD<CR>"  
 The following is BASIC and its Forth equivalent, Print a carriage return.

BASIC>  
 PRINT  
 FORTH>  
 CR

```

XRoar
File View Machine Cartridge Tool Help

EXEC

COLORFORTH 1.1
COPYRIGHT 1981 TJZ & RJT
UPDATED FOR DECB, JAN 2015, SMP

CR
OK
CR CR

OK
CR CR CR

OK

```

BASIC>  
 PRINT "HELLO COCO WORLD!"  
 FORTH>  
 ." HELLO COCO WORLD!" CR

```

XRoar
File View Machine Cartridge Tool Help

OK
CR CR

OK
CR CR CR

OK
." HELLO COCO WORLD!" HELLO COCO
WORLD! OK
CR ." HELLO COCO WORLD!"
HELLO COCO WORLD! OK
CR ." HELLO COCO WORLD!" CR
HELLO COCO WORLD!
OK

```

Hello CoCo World!

BASIC>  
 PRINT "HELLO COCO WORLD!";  
 FORTH>  
 ." HELLO COCO WORLD!"

BASIC>  
 PRINT 1+2  
 FORTH>  
 1 2 + . CR  
 BASIC>  
 PRINT 1+2;

FORTH>  
 1 2 + .

```

XRoar
File View Machine Cartridge Tool Help

CC-FORTH BIN 2 B 3
CCF-MISC BIN 2 B 4
CCF-ED BIN 2 B 4
CCF-DOLR BIN 2 B 4
OK
LOADM "CC-FORTH.BIN"
OK
EXEC

COLORFORTH 1.1
COPYRIGHT 1981 TJZ & RJT
UPDATED FOR DECB, JAN 2015, SMP

1 2 + . 3 OK

```

This shows that 1 + 2 is 3.

----  
 BASIC>  
 X=3  
 FORTH>

```
VARIABLE X
3 X!
```

----

```
BASIC>
X=3
PRINT X
```

```
FORTH>
VARIABLE X
3 X!
X @ . CR
```

----

```
BASIC>
X=0
X=X+1
X=X+1
```

```
FORTH>
VARIABLE X
0 X!
X @ 1 + X!
1 X +!
```

----

```
BASIC>
10 FOR X=1 TO 100
20 FOR Y=1 TO 100
30 PRINT X,Y
40 NEXT Y
50 NEXT X
RUN
```

```
FORTH>
VARIABLE X
VARIABLE Y
: TEST
  101 1 DO
    I X!
    101 1 DO
      I Y!
      X @ . . , " Y @ . CR
    LOOP
  LOOP
;
TEST
```

----

```
BASIC>
10 FOR J=1 TO 100
20 FOR I=1 TO 100
30 PRINT J,I
40 NEXT I
50 NEXT J
```

```
FORTH>
: TEST2
  101 1 DO
    101 1 DO
      J . . , " I . CR
    LOOP
  LOOP
;
```

----

```
BASIC>
10 REM THIS IS A TEST 1
20 'THIS IS A TEST 2
```

```
FORTH>
```

```
\ THIS IS A TEST 1 (This does not work in Color Forth )
( THIS IS A TEST 2 )
```

----

```
BASIC>
10 X=0
20 IF X=1 THEN Y=1 ELSE Y=0
30 PRINT Y
```

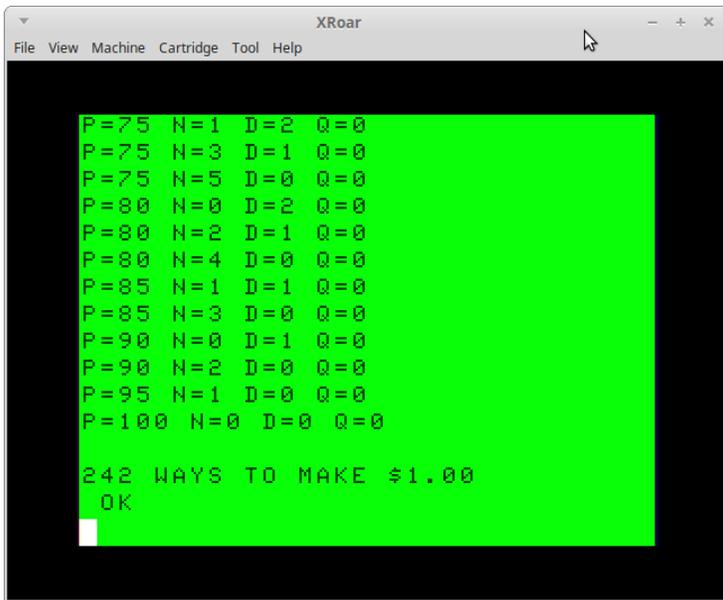
```
FORTH>
VARIABLE X
VARIABLE Y
: TEST3
  0 X!
  X @ 1 =
  IF
    1 Y!
  ELSE
    0 Y!
  THEN
  Y @ . CR
;
```

----

```
BASIC>
100 FOR PENNY = 0 TO 100
110 FOR NICKEL = 0 TO 20
120 FOR DIME = 0 TO 10
130 FOR QUARTER = 0 TO 4
140 IF PENNY + NICKEL * 5 + DIME * 10 + QUARTER * 25
= THEN PRINT PENNY;" PENNIES ";NICKEL;" NICKELS ";
DIME;" DIMES ";QUARTER;" QUARTERS":COUNT =
COUNT + 1
150 NEXT QUARTER
160 NEXT DIME
170 NEXT NICKEL
180 NEXT PENNY
190 PRINT COUNT;" WAYS TO MAKE A BUCK"
```

```
FORTH>
VARIABLE T
VARIABLE P
VARIABLE N
VARIABLE D
VARIABLE Q
```

```
: DOLLAR
CR 0 T!
101 0 DO
  I P!
  21 0 DO
    I N!
    11 0 DO
      I D!
      5 0 DO
        I Q!
        P @ N @ 5 * D @ 10 * Q @ 25 * + + + 100 =
      IF
        " P=" P @ . . " N=" N @ .
        " D=" D @ . . " Q=" Q @ . CR
        T @ 1 + T!
      ENDIF
    LOOP
  LOOP
LOOP
CR T @ . . " WAYS TO MAKE $1.00"
CR ;
DOLLAR
```



There are many ways to make a buck.

```

----
BASIC>
100 REM NAME: AGE.BAS
110 REM PURPOSE: TO SOLVE A WORD PROBLEM
120 REM BY: JOHN MARK MOBLEY
130 REM DATE: 01-17-2015
140 REM ENVIRONMENT: TANDY COLOR COMPUTER 3,
512K RAM, HDB-DOS
150 CLS
160 PRINT "THIS PROGRAM WAS WRITTEN TO"
170 PRINT "SOLVE A WORD PROBLEM. THE WORD"
180 PRINT "PROBLEM IS: FOR SIX CONSECUTIVE"
190 PRINT "YEARS, A MAN'S AGE WAS A"
200 PRINT "MULTIPLE OF HIS GRANDDAUGHTER'S"
210 PRINT "AGE. HOW OLD WAS EACH DURING"
220 PRINT "THE SIXTH YEAR?"
230 FOR HISAGE=1 TO 1000
240 T=0
250 FOR HERAGE=1 TO 16
260 X=(HISAGE+HERAGE)/(HERAGE)
270 IF X=INT(X) THEN T=T+1 ELSE T=0
280 IF T<6 THEN 330
290 PRINT "HIS AGE =";
300 PRINT HISAGE+HERAGE;
310 PRINT "AND HER AGE =";
320 PRINT HERAGE
330 NEXT HERAGE
340 NEXT HISAGE

```

```

FORTH>
VARIABLE HIS-AGE
VARIABLE HER-AGE
VARIABLE TOTAL-YEARS-IN-A-ROW
: AGE
( I was given a word problem and asked to write a )
( computer program to solve it. )
CR
." THIS PROGRAM WAS WRITTEN TO SOLVE A WORD"
." PROBLEM." CR
." THE WORD PROBLEM IS: FOR SIX" CR
." CONSECUTIVE YEARS, A MAN'S AGE WAS A" CR
." MULTIPLE OF HIS GRANDDAUGHTER'S AGE." CR
." HOW OLD WAS EACH DURING THE SIXTH YEAR?" CR
CR
1001 1 DO

```

```

I HIS-AGE !
0 TOTAL-YEARS-IN-A-ROW !
1001 1 DO
I HER-AGE !
HIS-AGE @ HER-AGE @ +
HER-AGE @
MOD 0 =
IF
1 TOTAL-YEARS-IN-A-ROW +!
ELSE
0 TOTAL-YEARS-IN-A-ROW !
THEN
TOTAL-YEARS-IN-A-ROW @ 6 >=
IF
." HIS AGE = "
HIS-AGE @ HER-AGE @ + .
." AND HER AGE = "
HER-AGE @ . CR
THEN
LOOP
LOOP
;

```

Output:  
AGE  
THIS PROGRAM WAS WRITTEN TO SOLVE A WORD  
PROBLEM.  
THE WORD PROBLEM IS: FOR SIX  
CONSECUTIVE YEARS, A MAN'S AGE WAS A  
MULTIPLE OF HIS GRANDDAUGHTER'S AGE.  
HOW OLD WAS EACH DURING THE SIXTH YEAR?

- HIS AGE = 66 AND HER AGE = 6
- HIS AGE = 126 AND HER AGE = 6
- HIS AGE = 186 AND HER AGE = 6
- HIS AGE = 246 AND HER AGE = 6
- HIS AGE = 306 AND HER AGE = 6
- HIS AGE = 366 AND HER AGE = 6
- HIS AGE = 426 AND HER AGE = 6
- HIS AGE = 427 AND HER AGE = 7
- HIS AGE = 486 AND HER AGE = 6
- HIS AGE = 546 AND HER AGE = 6
- HIS AGE = 606 AND HER AGE = 6
- HIS AGE = 666 AND HER AGE = 6
- HIS AGE = 726 AND HER AGE = 6
- HIS AGE = 786 AND HER AGE = 6
- HIS AGE = 846 AND HER AGE = 6
- HIS AGE = 847 AND HER AGE = 7
- HIS AGE = 848 AND HER AGE = 8
- HIS AGE = 906 AND HER AGE = 6
- HIS AGE = 966 AND HER AGE = 6

Bob Swoger found another solution where the man and the granddaughter are both born on February, 29<sup>th</sup>. His answer was 12 and 2.

More examples of BASIC-to-Forth can be found at:  
[http://rosettacode.org/wiki/Category:Programming\\_Tasks](http://rosettacode.org/wiki/Category:Programming_Tasks)

### 5 ¼ floppy-to-USB by John Mark Mobley

There is 5 ¼ floppy-to-USB for reading CoCo floppies on a PC. The details are in the links below.

- <http://ascii.textfiles.com/archives/2503>
  - <http://www.deviceside.com/fc5025.html>
- fc5025 usb 5.25 floppy controller  
<http://www.deviceside.com/>

It can read single and double sided floppies but not flippies.

Details about flippies can be found here:

<http://www.deviceside.com/flippy.html>

**Steven Hirsch** writes:

I have one of these. It's read-only. Does a very painless job of reading 35-track, single-sided Tandy Coco diskettes. With a very small amount of hacking (software is open source) it should be extendable to 40-track, double-sided, etc.

That said, my favorite disk-interchange environment is still ImageDisk on an ISA-buss 486 PC. I have 3.5, 5.25 and 8" drives all tied in to a Central Compaticard IV. Can read and write just about any FM or MFM format on earth.

### CoCo Chat

by John Mark Mobley

I recently discovered an IRC chat on Freenode for the CoCo. The channel name is coco\_chat. The web method for reaching the chat is:

[http://webchat.freenode.net/?channels=coco\\_chat](http://webchat.freenode.net/?channels=coco_chat)

You can use an application such as Xchat or HexChat to access an IRC chat. There are several people that use the chat. As I write this article, there are currently 17 people in the chat. If you're having trouble with your CoCo or an emulator, you can sometimes get a quick reply from this chatroom.

### OS-9 on the Raspberry Pi

by John Mark Mobley

Info on the CoCoList: <http://bit.ly/1ba8aj6>

Info from Microware: <http://www.microware.com/index.php>

More info from Microware: <http://bit.ly/1MCbpyt>

### Yet-Another-DOS (YA-DOS)

by Brett Gordon

Features:

- \* Modularized, multiple simultaneous drivers.
- \* MPI support
- \* Real Drive Partitioning
- \* Extended BASIC support of DriveWire4 and SDC commands.
- \* Compatible with HDBDOS/RGBDOS partitions / applications

"Yet Another DOS" has been released BETA. I need help in testing features and hardware.

Here is an excerpt from the README.TXT:

YA-DOS is a branch of HDBDOS for the CoCo2 and CoCo3. Original HDBDOS is an 8K ROM. YA-DOS is a 16K ROM. Although based internally on the HDBDOS code, much of the functionality has been changed and appended to. The drivers have been fully modularized and a new device/drive switcher has been added to allow the simultaneous use of many different devices and/or drivers. Where HDBDOS only allowed relatively static setup of a single device plus a stock FDC at a time, YA-DOS allows for the dynamic setup of devices. To this end, YA-DOS supports the use of a Multi Pak Interface (MPI) inherently, and other than initial setup, little is required to use devices on different MPI slots.

Another great feature of YA-DOS is the support of a Drive Partition Table. Drive partition tables have been used to great advantage in many other systems, and until now have

been unsupported by the Color Computer's main operating systems, BASIC, OS-9, and Nitros9.

Partition tables not only allow cross-OS cooperation of the use of large media, they also provide for larger use of the media, and take the burden of setup off the user. Whereas HDBDOS was generally restricted to a single, ROM based drive offset, YA-DOS supports on-the-fly setting and multiple partitions in use (14 per device, 4 in simultaneous use). Removable media of different sorts (SD, CF, DW) becomes much easier to use as the media itself contains its own partition table.

YA-DOS also provides for better integration of BASIC and Drive Wire4's (DW) and CoCoSDC (SDC) user interface. New BASIC commands have been added to allow for control of disk images. The insertion and mounting of disk images in DW and SDC can now be fully automated with YA-DOS at boot. DriveWire's advanced controls over server logs and MIDI channels is now at least partially supported.

Get YA-DOS here:

<https://sites.google.com/site/cocoboot2/ya-dos>

(includes dsk image, SDCDOS rom burner app, ROM image, Docs, and a "FDISK"-like partitioning program)

### Invader09

by Allen Huffman

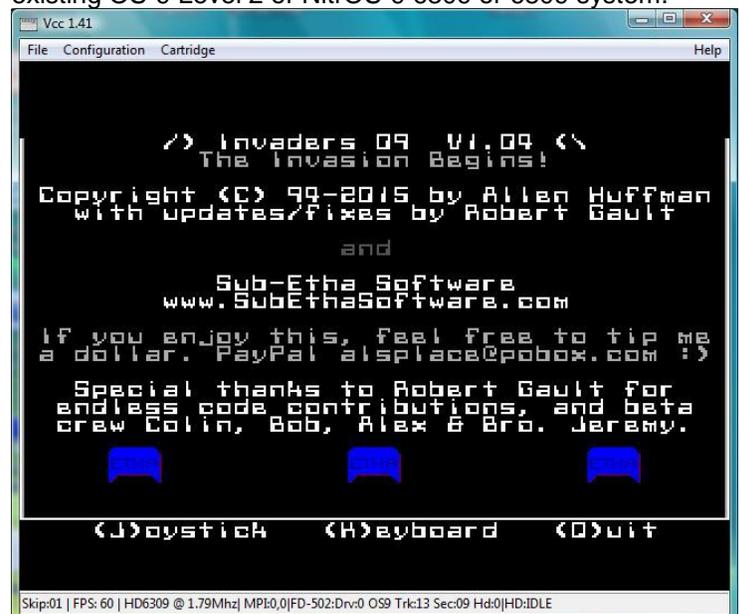
See the full notice here: <http://bit.ly/1Aq5bca>

Sub-Etha Software has released another update to our Color Computer 3 OS-9 Space Invaders-style game, Invaders09. Version 1.04 is now available and is a recommended upgrade for all users. It supplants previous February 1995 release of 1.03. As with all Sub-Etha Software products, bug fixes and maintenance releases are free upgrades.

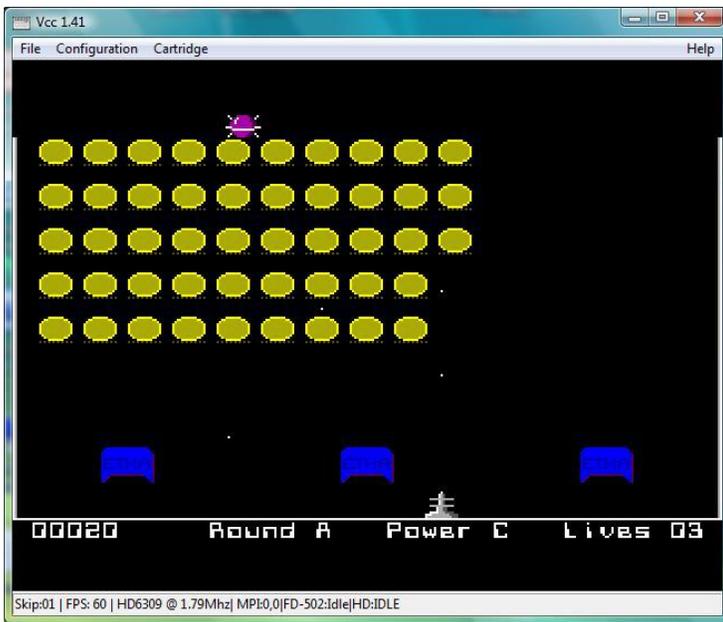
You may download the 1.04 update as a self-booting .DSK image from our update server:

<http://macintoshgarden.org/games/invaders-09>

The INVAD09.DSK image includes a fully bootable version of Nitros-9 v3.3.0 and may be run directly on a real Color Computer 3 or emulator just by mounting the image and typing "DOS". You may also copy the invaders1.04.txt documentation file and CMDS/invaders1.04 binary to your existing OS-9 Level 2 or Nitros-9 6309 or 6809 system.



Invader 09 Title Page



Invader 09 Main Screen

### Invader's Revenge (VADREV) by John Mark Mobley

This is a game by Ken Kalish. It is like Invader except you play the opposite side. You play the space ship at the top of the screen instead of the cannon at the bottom of the screen.

Download VADREV.BIN: <http://bit.ly/1EfXWVz>

Download vadrev.dsk  
<https://dl.dropboxusercontent.com/u/8040060/vadrev.dsk>

I have played this game in VCC and XRoar. It will play a game or two in VCC and then crash/get hung, requiring a power cycle to work again. It runs more stable in XRoar. My guess is that it runs better on a CoCo 1 or CoCo 2 than a CoCo 3. If you are running on a CoCo 3 and using the RGB monitor output, then use the RGB command to set the correct colors. If using DriveWire, type the slow speed poke after loading the game. There is a BASIC loader included with the DSK file that will automate the loading and slow speed poke process.

BASIC Loader Ex:

```
10 REM RGB
20 LOADM "VADRVE.BIN"
30 POKE 65496,0: REM SLOW POKE
40 EXEC
```



Invader's Revenge Title Page



Invader's Revenge – You control the yellow space ship

### CCEDIT by Brett Gordon

CCEDIT: A Simple Full-Screen Text Editor for the BASIC environment

Copyright 2015, Brett M. Gordon

Requirements:

- \* A CoCo3 (128K or 512K)
- \* DECB 1.1 compatible system (YA-DOS, SDC-DOS, HDBDOS, RGBDOS, others?)
- \* Composite or RGB monitor (high contrast 80 column screen)

Features:

- \* Supports large edit buffers:
  - 512KB RAM: ~440KB buffer size
  - 128KB RAM: ~78KB buffer size
- \* Real Key Repeating with Delay
- \* Specify file name to edit via BASIC's "command line"
- \* Emacs-ish commands
- \* Made in the spirit of Luis Antoniosi's "minTED", but for BASIC

Download ccredit.zip

<https://sites.google.com/site/cocoboot2/userspace>

### A Low Budget Trip to CoCoFEST 2015 By Making Printed Circuit Boards (PCBs) By Kip Koon, Computer Doc

I was faced with a dire situation. (Ominous music plays with an interestingly mysterious quality to it.) I desperately wanted to go to CoCoFEST 2015 this year with virtually no resources and very little income to be had due to the fact that every time I apply for computer related technical positions and then send in my resume to the recruiter, the response I receive over and over again is, "You are overqualified." which means to me they don't want to hire smart people, just stupid idiots. Then one day, I got the thought from On High that I

should make Printed Circuit Boards (PCBs) for people, so over the course of several months I have come up with 4 products that I'm offering to the fine individuals on the Coco List and anyone else who is interested. I'm currently making 4 PCBs total so far with more in the works. Yes, I have become a very busy bee! In a nutshell, they are:

1) The Kipper SBC v1 – The inspiration for this little gem is a 6809 single board computer that a gentleman named Grant Searle in Merry Ole' England designed. It's called the 6 Chip 6809 Computer specifically because he built it in just 6 chips! I had been looking for a tiny 6809 computer to build as my first digital electronics hardware project and this was it! I was hooked! Grant is a very brilliant Digital Electronics Engineer. The Kipper SBC builds on that original design by providing 3 memory maps instead of just 1 in only 9 chips instead of 6. A difference of 3 chips was all it took to realize my dream of building my very own 6809-based computer with a few extras thrown in for good measure. See Grant Searle's web site for further and more complete details on his "6 Chip 6809 Computer" design at the following link. <http://searle.hostei.com/grant/6809/Simple6809.html>

Briefly, the Kipper SBC v1 has the same basic components as Grant's design. Both designs have a 6809 CPU, 32KB of static RAM, 16KB of EPROM, an MC68B50 Asynchronous Communications Interface Adapter (ACIA), a MAX232 Voltage Translator, and address decoding logic for the glue to hold everything together. :) In Grant's design, the address decoding was done with one chip whereas in my design I got a little more involved. Like the immortal words of Walt Disney himself who said, "Now plus it!", I always like to improve on things trying to make them better.

The 6 Chip 6809 Computer memory map is as follows:

RAM = \$0000-\$7FFF – 32K  
OPEN = \$8000-\$9FFF – 8KB  
IO = \$A000-\$BFFF – 8KB  
ROM = \$C000-\$FFFF – 16KB

The default memory map in the Kipper SBC v1 makes a slight change in Grant's design. Instead of the IO taking up an entire 8KB block of address space, the IO in the Kipper SBC v1 only uses 2KB. This the only difference in the Kipper's default memory map and the one Grant created.

In the Alternate or Enhanced Memory Map, I reduced the ROM addressing (with the help of Retro Innovations who was indispensable in coming up with an efficient address decoding logic) by 4KB by moving the ROM's starting address to \$D000, moving the IO from \$A000 to \$C000 and reduced how many addresses the IO uses down to 2KB which expanded the OPEN area to 16KB and added a new open area at \$C800-CFFF. Here's the Enhanced Memory Map or Memory Map 2 of the Kipper SBC v1.

RAM = \$0000-\$7FFF – 32K  
OPEN = \$8000-\$BFFF – 16KB

IO = \$C000-\$C7FF – 2KB  
OPEN = \$C800-\$CFFF – 6KB  
ROM = \$D000-\$FFFF – 12KB

This gives the user the possibility of adding 16KB of RAM at \$8000-\$BFFF making the total RAM in their computer system 48KB. Also since the IO addressing is now only 2KB, the 6KB open area can be used for other IO.

There is one more memory map that is made possible by an input pin called BASE\_ENABLE on the Kipper Bus that is connected to the address decoding logic which with an active HIGH logic level will disable all RAM, IO and ROM completely leaving the entire 64KB memory address space of the 6809/6309 open for the user to use as he or she sees fit. This 3rd memory map option turns the Kipper SBC v1 into a Kipper CPU v1 Board and with the 50-pin Kipper Bus connector, it can provide all CPU signals unbuffered to the rest of the computer system. The user is free to design whatever add-on Kipper Bus-compatible cards they wish. The overall size of the Kipper SBC v1 PCB is approximately 3" x 3" which is a perfect size SBC for anyone who wishes to begin studying the 6809 or 6309 microprocessor at the hardware level.

The initial software that will be provided with the Kipper SBC v1 will be Grant's 6809 Extended Basic in Memory Map Mode 1. A modified version of the 6809 Extended Basic Interpreter will be needed to run in Memory Map Mode 2 since the IO has changed.

I am making plans to provide an enhanced version of the 6809 Extended Basic which will (hopefully) include Tormod Volden's DWLOAD assembled in with the 6809 Extended Basic giving it rudimentary DriveWire 4 capabilities. The main difference between DWLOAD and HDB-DOS is that DWLOAD will access individual files in the DriveWire 4 folder whereas HDB-DOS accesses disk image files. DWLOAD can load from and save binary and BASIC files to the DriveWire 4 server. Tormod originally made DWLOAD to provide a better solution than what Color BASIC originally tried to do with the DLOAD command. This ROM-able software package is in the planning stages currently.

Another software possibility is to adapt CUBIX created by Dave Dunfield which resides in less than 8KB of ROM to run on the Kipper SBC v1. CUBIX can be adapted to many types of storage devices, and full documentation for the CUBIX system, along with all necessary software including sample drivers, are provided on Dave Dunfield's web site, on which he also describes his D6809 computer running CUBIX at the following link:

<http://www.classiccmp.org/dunfield/d6809/index.htm>

The CUBIX Information page is at

<http://www.classiccmp.org/dunfield/d6809/cubix.htm>

and the download links for his D6809 Simulator with CUBIX running on it and the entire CUBIX software package are at the bottom of the first link above. It will be very interesting to me to find out what different types

and kinds of Kipper Computers budding hardware engineers will eventually be created with this little Kipper SBC v1 as the starting point.

2) A 512KB Static RAM Memory Upgrade board for the CoCo 3 – This is a low temperature RAM upgrade solution for your Color Computer 3 utilizing all static RAM chips, eliminating the need for the CoCo 3 to refresh the RAM, thus reducing the drain on the CoCo 3's power supply. This upgrade is fully compatible with the original Tandy 512KB Dynamic Ram Memory Upgrade and supports NitrOS-9 L2 v3.3.0's ability to use all 512KB fully, as well as any DECB programs written to use the 512KB of Static RAM memory as well. Upgrade your stock CoCo 3 128KB machine to 512KB of Static RAM memory and find out what all you have been missing out on. This board is designed by Sylvain Rousseau and myself. Without his troubleshooting capabilities, this 512KB Static RAM Memory Upgrade would not have been possible.

3) The Wordpak2+ - This 15KHZ VGA video card allows you to add a 2nd monitor to your CoCo 1 or 2 giving you the ability to have 80-column text screens and many types of graphic screens as well. This board is based on the Yamaha V9958 video display processor and was designed by Luis Antoniosi for the specific purpose of giving the CoCo 2 a full size 80-column text screen under NitrOS-9 and I believe under DECB as well. As far as I know only drivers for text screens have been written. Although the V9958 VDP has many graphic screen capabilities, the driver does not take advantage of them - yet. :) Since I primarily use NitrOS-9 I have not checked out the possibilities of using DECB with this card yet. It uses the older 15KHZ monitors. It will not work with modern 31KHZ computer monitors. For a solution to this problem, see the next board on my list.

4) The RGB2VGA Converter Daughter Board – This board mates with the Altera DE-0 Nano FPGA development board creating a complete solution for converting 15KHZ VGA video signals to the modern 31KHZ video signal standard, giving you the ability to connect modern computer monitors to your old 8-bit computer equipment like the CoCo 3. Luis Antoniosi has included settings for several vintage 8-bit computer systems. The Altera DE-0 NANO must be programmed with Luis' Custom VHDL code in order to function correctly. Once the code is compiled and downloaded into the Altera DE-0 Nano, the RGB2VGA converter daughter board can be plugged into the top of the Nano. Now plug the VGA input connector to the RGB output of your 8-bit computer and the modern 31KHZ computer monitor of your choice into the VGA output connector and enjoy beautiful color video displays from your old computer on modern computer monitors.

I'm building these boards to raise the necessary funds to go to this year's CoCoFEST! Please help a fellow CoCoNUT get to CoCoFEST 2015 by purchasing one or more of these printed circuit boards. Bare boards,

kits, and assembled versions are available. Contact Kip Koon at the following email address – [computerdoc@sc.rr.com](mailto:computerdoc@sc.rr.com) – for current pricing for all products.

I will be bringing several Multicomp boards, also based on Grant Searle's minimal 8-bit computer designs using a hardware-programmable FPGA chip for most of the entire system. The Multicomp PCB was designed by Dr. Acula (James Moxham) along with Max Scane from N8VEM using Grant Searle's minimal low chip count 8-bit computer designs with some improvements. The 128KB Static RAM chip in the original design has been upgraded to 512KB of Static RAM. A small prototyping area has been added as well as an LCD video display interface connector, LEDs to reflect the status of the LEDs which you cannot see on the FPGA board, and an SD card Interface. The LCD displays are available from eBay. The really cool capability of the Multicomp SBC is that it can be programmed to be a 6809, 6502, or Z80 SBC running a basic interpreter or various operating systems.

My Z80 Multicomp can run a BASIC interpreter, CP/M 2.0, CP/M 3.0 and MP/M II v2.1. MP/M currently supports 2 users, and in development is a version of MP/M that supports 3 users, which I hope to demonstrate at the CoCoFEST if it can be finished in time by Max Scane of the N8VEM email list.

I have also programed one of my Multicomp boards to be a 6809 SBC running a modified version of the CoCo 2's Extended Color Basic called 6809 Extended Basic. All commands relating to video graphics, the keyboard, joysticks, sound, and cassette storage have been removed since the hardware does not exist on the Multicomp. This 6809 Extended Basic is the version that I hope to be able to integrate Tormod's DWLOAD program, giving this little 6809 computer online storage capabilities.

Also for this year's CoCoFEST, I hope to have the CUBIX Operating System running on the 6809 Multicomp board. Currently, CUBIX is not booting as no CUBIX boot time messages appear on the screen. The entire CUBIX OS is contained in the 8KB ROM, which in this installation is programmed into the FPGA chip.

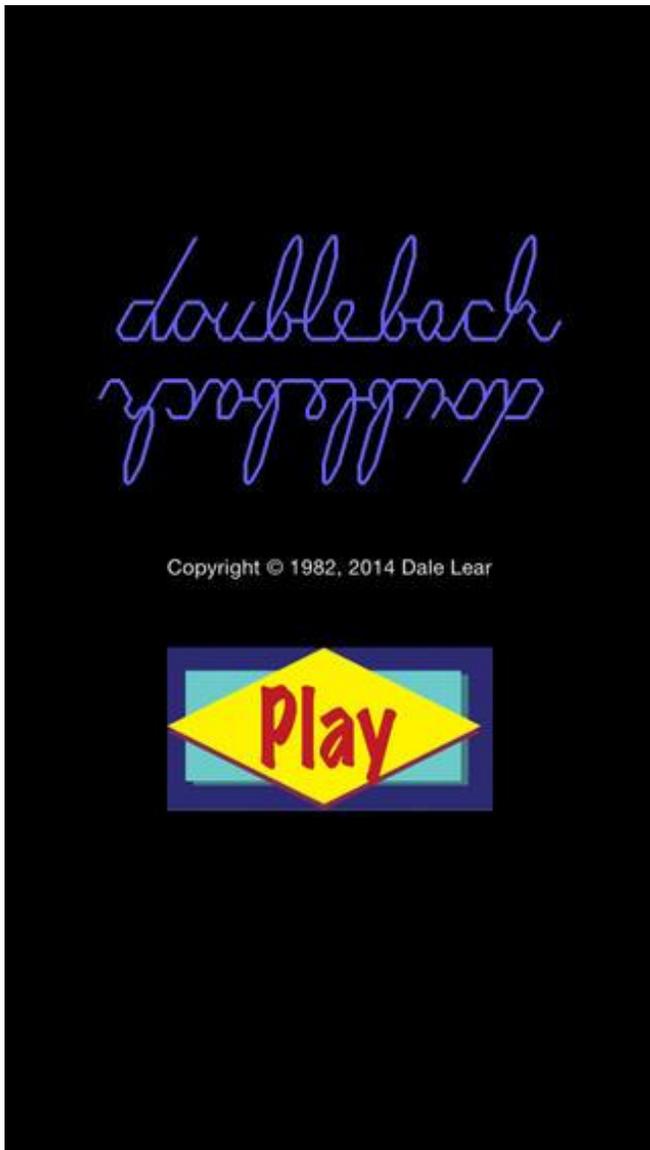
The third and final version of the Multicomp is a 6502 based SBC with a 6502 version of a BASIC interpreter in the 8KB ROM. Though I have had this version running, I know little of the 6502 world in general, and even less about the 6502 BASIC interpreter, though I would expect a lot of the traditional BASIC commands are there, since my little test program I created worked great! What is the first program most people write to run on a brand new computer system they have just built, troubleshoot, and gotten running after much blood, sweat, and tears? Why, the tried and true "Hello World!" program, of course, only mine displayed, "Hello Daddy!" :) That is as close to having my own children as I will ever get, but that is another story.

I am building an ECB Mark IV SBC based on the Zilog Z8S180 33MHZ CPU chip on a Eurocard 3U format (100mm x 160mm) sized PCB. I have the PCB completely built, save for 17 chips which I have been patiently waiting to purchase when I have the funds. An N8VEM member is writing an operating system called FUZIX which I am eager to try out when the PCB is finished. As the name FUZIX sounds, it is a UNIX derivative. I wonder how fuzzy FUZIX can make an SBC become. :P Well, I think I have held your attention long enough. It's time for me to get back to one of my many projects I have going. See you all at CoCoFEST 2015 in Lombard, IL on April 25-26, 2015! Take care, my friends! Starfleet out! Qaplah! End transmission!

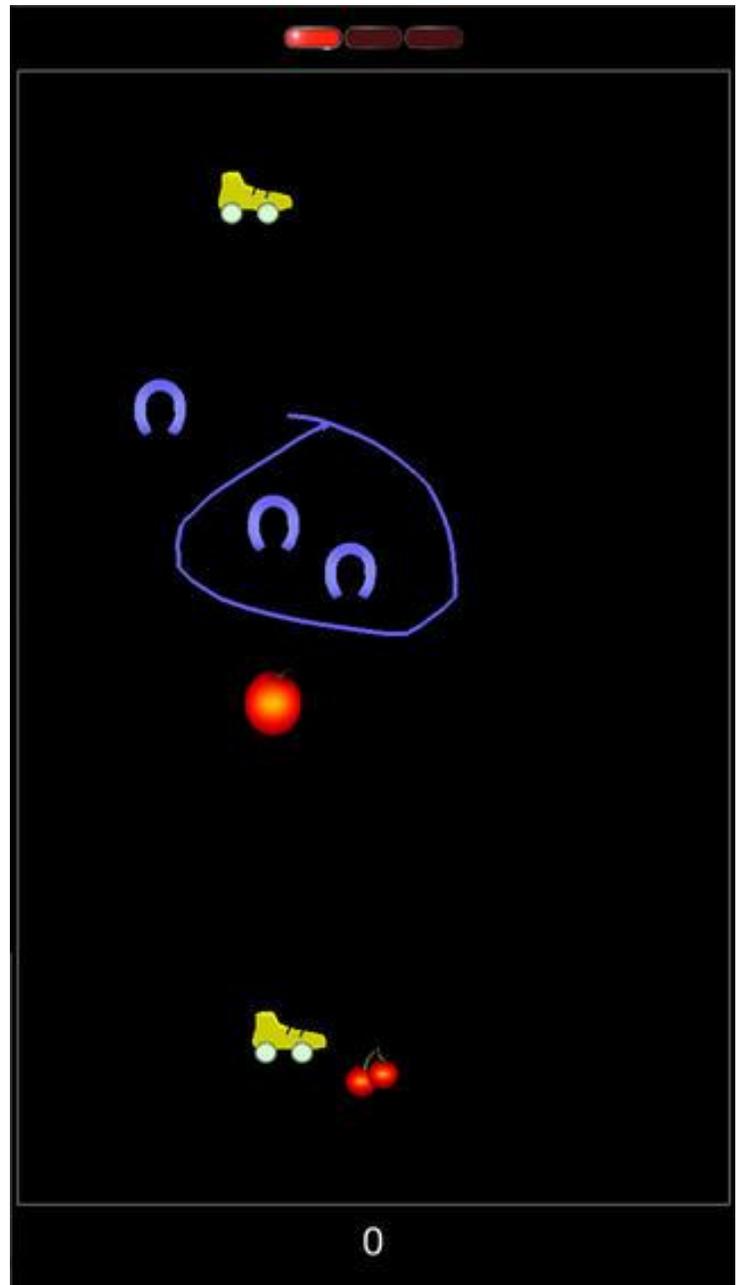
**CCEDIT Doubleback 2015**  
**by John Mark Mobley**

Doubleback, originally designed for the CoCo, has been redesigned for iOS by the original author, Dale Lear. Now you can play Doubleback on an iPhone, iPod Touch, or iPad.

<https://itunes.apple.com/us/app/doubleback/id819310153?mt=8>



Doubleback



Quickly circle the objects to get points

See you this year: April 25 & 26, 2015  
**HERON POINT CONVENTION CENTER**  
645 West North Avenue  
Lombard, IL 60148  
665 Building on the lower level  
Saturday 9 am to 5 pm, Sunday 9 am to 3 pm

**Calendar of Events**  
by  
**John Mark Mobley and Salvador Garcia**

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Thursday, April 9, 2015  
7:00 PM to 9:45 PM CST  
Glenside Color Computer Club, Inc. Business Meeting  
Schaumburg Public Library  
130 South Roselle Road  
Schaumburg, IL, USA  
Skype access available via: john.mark.mobley

Saturday, & Sunday April 11 & 12, 2015  
Midwest Gaming Classic  
Brookfield, Wisconsin, USA  
Link: <http://www.midwestgamingclassic.com/>

Saturday, & Sunday April 11 & 12, 2015  
DEC Legacy 2015  
Marchesi Centre, Windermere, UK  
Link: <http://wickensonline.co.uk/declegacy/>

Friday, Saturday, & Sunday April 17-19, 2015  
Vintage Computer Festival East (VCF East)  
Wall, New Jersey, USA  
Link: <http://www.midatlanticretro.org/>

Saturday & Sunday April 25 & 26, 2015  
The 24<sup>th</sup> Annual "Last" Chicago CoCoFEST!  
Heron Point Building  
Next to Fairfield Inn & Suites  
Basement/Lower Level  
665 West North Ave.  
Lombard, Illinois 60148, USA  
Link: <http://www.glensideccc.com/cocofest/index.shtml>

Friday, Saturday and Sunday May 1-3, 2015  
Vintage Computer Festival Europa (VCFe)  
Mehrzweckhalle des ESV München Ost  
Link: <http://www.vcfe.org/E/>

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

## The 24th Annual "Last" Chicago CoCoFEST!



**2015 CoCoFEST!**

**Proudly Presented By**  
**The Glenside Colour Computer Club**  
**Fairfield Inn, Lombard, Illinois**

Here are the 5 "W's"

- WHO?** 1) Glenside Color Computer Club, Inc.  
**PRESENTS**
- WHAT?** 2) The 24th Annual "Last" Chicago CoCoFEST!  
**WHEN?** 3) April 25 & 26, 2015  
(Sat. 9 am-5 pm; 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 2014!)**

**Overnight room rate:**

**\$84.00 plus 11% tax (\$93.24 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**  
**Saturday & both days: \$5.00 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 630-589-4692, VOICE**  
**[tonypodraza@gmail.com](mailto:tonypodraza@gmail.com) [rswoger@aol.com](mailto:rswoger@aol.com)**

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

3rd time's the charm - this is the last \$5 fling as this will be our last visit to this location. The Fairfield has been good to us but no longer owns Heron Point.