OS-9 Newsletter

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NW CoCoFest

Well, our first Northwest Color Computer Festival/Convention is over and by all accounts, it was a smashing success. Nothing on the scale as the RainbowFest in Chicago or even the Atlanta CoCo Fest, but in our own small way....it was a blast!

SESSION I: The Computer Bank Charity, presented by Brook Stanford
The following is an introduction given by Donald Zimmerman for The Computer Bank Chairty and it's speaker Brook Stanford:

There was a time when power meant only brute force. If you could beat, kill, maim another, you had power over him or her. But as groups of humans used their minds more than there brawn, power expended to also mean knowledge. Those in the know were to some degree in power, or in control of things or people around them. Priests have had power for centuries because they stated they had knowledge about the greatest mysteries of the unknowns regarding right/wrong and life. Scientists, quasi and otherwise, have held positions of power because of their knowledge. And rulers, bosses, and leaders many times are in positions of power not because of their competence or intellect but rather because of what they know about the personalities and workings of the social system they oversee.
And what does this little discourse have to do with computers? Well, with the advent of the personal computer the masses discovered they could have power also by working SMARTER ratherthan just harder. But there was a line of have's and have-not's determined by the buying power of the group or person involved. Even if you understood the effectiveness computers could bring; if you were too poor to get a computer you were without power in this social sense of the word.
Now the Computer Bank Charity has begun to erase that line. The CBC is literally GIVING power to those who can not afford to maintain a cross referenced data base of it's group. It GIVES power to those who can not afford to do a mass merge mailing campaign for their cause. It GIVES power to those with disabilities than NORMALLY would stop them from being productive or communicative. It GIVES power to expose more of our youth to the technology that most certainly will be running much of their world in the years and decades to come.
Brook Stanford, a non-computer user and KOMO-TV journalist, stumbled upon a need and he took action rather than wonder what would work. He built upon what is, rather than lament the unfairness of the have's and the have-not's. He has added his strand of life-thread to the fabric of goodwill that already exists in his world and made that fabric stronger.

<div align="center">--Donald Zimmerman--</div>

Brook Stanford, with his KOMO-TV "PEOPLE HELPER" program put together a committee made up of individuals from Puget Sound computer clubs. This committee became the Computer Bank Charity, which meets the 4th Thursday of every month at the studios of KOMO-TV. The CBC solicits and collects donated computer equipment, then screens applicants and distributes the computer equipment to worthy recipients.
Some very wonderful video tape footage was shown by Mr. Stanford demonstrating the need and very effective and rewarding service provided by CBC. Any and all interested parties are invited to participate by attending the monthly meetings or by contributing useable computer equipment.

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SESSION II: "Connecting Computers To The World" presented by Scott Honaker

Scott Honaker is President of the Seattle 68xxxMUG (CoCo/OS9 Users Group) and is employed in the Product Support and Development Division of Microsoft. His presentation as always was very informative and entertaining, relating the wealth of information available to computer users via their telephone and a modem connected to their computer.

Microsoft's co-founder, Bill Gates, resently stated his vision of the future of computing with the phrase, "Information at your fingertips". His dream is to see networking integrated into operating systems so machines can be connected seamlessly allowing access to any type of information painlessly. Networking is normally done over a very tightly controlled system with limited range.

Remember the OS-9 Level Two Development System package that you must have for OS-9, but Tandy no longer stocks it! Turns out they do stock it, only without the binder. Stock #26-3032. Call 1-800-442-2425. Terry had all sorts of similar information to pass on to us.

On a recent trip to California, near the Mexican border, Terry found a Radio Shack store that was fully stocked with Color Computers, CM-8 Monitors and tons of CoCo/OS9 software. The Color Computer-3 should still be available in the warehouses for $69, but are being bought up by private companies. One rumor has it that they are being sold to Russia for use in their space program since the U.S. has an embargo on the more powerful type computers. (More powerful? or faster cpu's?)

Did you know that OS-9 Pascal, C-Compiler and D.L. Logo are still available? All in all, Terry Laraway's session was informative, entertaining and full of good advice on persevering and following the right path to find that elusive piece of hardware or software.

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SESSION VI: "The Future is at our Fingertips" by Bob van der Poel

Bob van der Poel, author of Telewriter-64 and VED OS-9 Text Editor turns out to be almost a Pacific Northwesterner living in Wynndel, British Columbia, just across the border from Porthill, Idaho. Bob decided not to make the 10 hour drive to attend the NW CoCo Fest, but did send along his speech.

Well, my history with the coCo is much like many others. I bought my first Radio Shack Color Computer back in 1981 just after they'd started making them. Mine was a 16K with Extended Color Basic. Why did I get it? Certainly not because I knew anything about computers. In truth, it was because the Apple and Commodore salesmen totally confused me with their talk of RAM and ROM, etc. The guy at the Shack just told me the price and asked for my credit card.

At that time I knew nothing about computer--that's why I bought one. With all the talk about how computers were going to take over the world, the time to learn seemed right. So, I took that silver-grey machine out of the box and started reading the manual. Then I started to learn to program in BASIC. And my life has never been the same since!

I started out by purchasing software from ads in The Rainbow and listing out programs I got from my Chromasette subscription. But I was never happy with other folk's efforts--so I started to make little changes. And then larger changes. And then my own programs which I sold through a local computer store in Edmonton, Alberta Canada.

Programs you might know include Telepatch (a set of improvements for Telewriter-64), Telewriter-128 (still the best WP for the CoCo3), VED and VPRINT (an OS-9 word-processing package) and a large number of smaller utilities. In addition I've written a number of articles in Spectrogram, CoCo Clipboard, TRS-80 Computing and The 68xxx Machines. All in all, it's been a busy ten years.

The present state of the CoCo

As you all know, Tandy is no longer marketing the Color Computer in any form. And they are dumping out their entire stock of software and hardware as quick as they can at deeply discounted prices. The major magazine, Rainbow, continues to shrink and fewer and fewer new pieces of software are being released and the folks who wrote most of this software have moved to other machines. Third party vendors of hardware and software are becoming fewer and harder to find.

So? Is this the end of our favorite little computer?

!! NO !!

The reality is that nobody is going to come knocking at your door to ask for your CoCo back! The software that has been churning along doing all those tasks for you will continue to do the same job. The only one who is going to pull the plug on your CoCo is you.

The Future

Soothsaying has always been a dangerous profession, and I'm not anxious to get into it. But, let me make a few predictions anyway. And, perhaps more important at a meeting like this, offer some words of encouragement.

1. The amount of new software and hardware being released for the CoCo will dwindle. I know of a few people who are working on some pretty exciting things (a scanner interface, a C-compiler for RS-DOS, etc.), but how many of these will ever see the light of day....well, I don't know.

2. The CoCo Clone (Frank Hogg's TC9) will sell a credible number of units in the short term. Most of the purchasers will be OS-9 types looking for a smooth path to OS-9/68000.

3. A large number of CoCo owners will purchase TC-70's, System IV's and MM/1's. Why, simply because they run OS-9/68000, an advanced, multi-tasking operating system.

As an aside, I heard a rumor that most of the CoCo3's in Tandy's warehouses were sold to companies who strip the motherboard out of the box and use it as a low cost base for some pretty fancy equipment. The computer you have is certainly not an archaic machine.

So where does this leave you?

The real strength of the CoCo has never been with Tandy--it has been with people like you. People like you who know the power of the 6809 CPU. People like you who don't believe that you need a massive amount of memory to do the jobs most computers do. People like you who appreciate the power of our humble little computer.

Now, more than ever, clubs are necessary for support. If possible, you should try to form links between your own club and others in the next town, state or country.

Electronic forums will be a growing part of the support network. Rates continue to drop on Delphi and Compuserve. And more networks are becoming linked so that you can access a lot of information from something like a local BBS.

Little newsletters and magazines will continue to appear (and, most likely, disappear). Support them and their advertisers.

Finally, share the names of the vendors you know about and their products with your friends so they too can purchase the programs you like.

My Future

Even though I'm typing this letter out on my CoCo, I'm spending less and less time with it. I've got an MM/1 on my desk and am busy developing software for it and the other 68000 OS-9 machines. My text editor, VED/68000, is now available and I hope to have VPRINT/68000 ready to ship by the end of the summer. But my CoCo is still being used a lot. And, as long as there is a demand, I'll continue to support the programs I've written over the years for the CoCo.

     -Bob van der Poel-

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SESSION VII "Up, Upgrade and Away" presented by Rodger Alexander

It's kind of hard to review one's self, so I will simply relate to you what I did at my presentation.

Bob van der Poel's letter immediately preceeded my session and served as an excellent introduction. I followed with a listing of the physical limitations of the Color Computer, many of them being imposed by Radio Shack to maintain backward compatibility. Many of these limitations can be remedied by adding one or more disk drives (double sided), installing a modified-expanded Disk ROM such as Extended ADOS-3. Additionally more memory (512K) and a Hard Drive can elivate the computer to it's fullest potential in it's ROM based form, and I haven't even mention an RGB monitor.

The Color Computer can be upgraded even further by operating under the OS-9 Level Two multi-tasking environment. However, OS-9 is somewhat alien to Extended Disk Basic users mainly due to the multiple hiearchial directory structure and the fact that OS-9 is always operating in two separate directories at the same time. Unfortunately for most, the solution to OS-9's complexities is to return to Extended Disk Basic. Don't give in! Seek HELP!

If and when OS-9 is finally managed (not mastered) there are a multitude of upgrades that can be done to OS-9's drivers and descriptors to really make the Color Computer take off! 512K memory and 2 floppy disk drives are almost mandatory for successful operation with Level-Two. After that, the next thing is to replace SHELL with SHELL+, replace GRFDRV with Kevin Darling's high speed patch, patch the TERM and CC3GO so that the CoCo-3 boots up with an 80 column screen.

The list goes on and on: Replace the CoCo Keyboard with an IBM-XT keyboard using Puppas keyboard interface; install a real time clock; replace the CoCo floppy controller with a no-halt floppy disk controller. Add a hard drive (OS-9 was designed to work with hard drives). "Hack" the Speech Sound Pak so that it will work with the higher CPU speed of OS-9 and modify all device drivers to maximize the operation of your hardware. If you like Multi-Vue, replace GSHELL with the patched 80 column version of GSHELL+.

As part of the session, I distributed a 7 page handout describing most standard software and hardware upgrades, and included a floppy disk containing all of the OS-9 upgrade modifications listed in the handout. I also passed out the April issue of the OS-9 Newsletter which featured 4 variations on installing a CoCo-3 into a PC case.

As a finally to my presentation, I pulled the cover off my PC mini tower case and proceeded to rip out and display my hardware upgrades:

1. Disto Super Controller II (no halt floppy controller)
2. Burke and Burke hard drive interface and Western Digital hard drive controller card
3. Modified Speech Sound Pak
4. Speech System's Real Time Clock
5. IBM keyboard adapter
6. 3-1/2 inch 720K floppy disk drive and 2 5-1/4 inch 360K floppy disk drives
7. Relay block to switch High Resolution Joy Stick Interface in and out via the "turbo" switch
8. +5VDC applied to the unused joy stick "fire" pin to disable the keyboard with the "keyboard lock" switch.
    –Rodger Alexander–

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SWAP MEET

If you have been looking for bargains to upgrade your CoCo system, even your MS-Dos PC system. YOU SHOULD HAVE BEEN THERE! The swap meet was set up in a large square room (60x60) with tables set up for sellers to display their wares. I had a bunch of stuff to sell as well as setting up our Bellingham OS-9 Users Group Display. Between the club's items (Public Domain Library Disk, OS-9 Tutorial, "How To" Video Tapes, OS-9 Newsletter subscriptions) and my personal items, we cleared almost $150.

There was everything you could think of: CoCo-1's & 2's, single sided and double sided floppy drives, monitors, an FHL CoCo Keyboard for $10, 20 meg hard drive for $70, acustic printer covers, power supplies, software, etc.

I bought a "like new" Magnavox monochrome monitor for $20, Multivue for $12, Speech Sound Pak for 50 cents, a couple of 5-1/4 inch half heighth drives were given to me (broken), and I'm still willing to buy that FHL Keyboard if I can find the owner.

See you NEXT YEAR!

Repair your own Multipak

This is a report on the repair of a DEAD old style (26-3024) Multipak with upgraded PAL, bought from Dan Monday at the Chicago CoCo Fest for $15. Every logic chip in pak has been desoldered and socketed. Most have been replaced. Will not recognize the disk controller in any slot. Just gives Extended Basic at power up.

Test of Reading Disk ROM: Disk ROM totally NOT seen. Response to BASIC program to peek disk basic ROM and print CHR$ to screen gives all FF's. Same result with all slots.

Inspection & Initial Test: Extremely Low Quality single wipe tinned sockets used for some IC's. Otherwise, an apparently high quality job was done of desoldering chips and soldering in sockets. Bottom of board looks clean. Solder joints generally quite professionally done... perhaps a little too little solder in one, but nothing likely to cause problems. No visible cold solder joints. No visibly obvious breaks in traces, though some traces in the vicinity of desoldered chips look a little raw. All three power supply voltages are present and correct.

Further testing: Place logic probe on the two select lines that are used to set the LS153 and LS139 to select CTS and CART and SCS lines. Poking different numbers into $FF7F (hex 00, 11, 22, and 33) causes status of the two select lines to vary appropriately.

Conclusion: All address buffers are functioning properly. Placing logic probe on pins of the selector chips that should be connected to select line reveals that low order select line does not connect to appropriate pin of LS139 chip. PUSHING HARD on that pin with the logic probe makes connection occur. LS139 removed and socket inspected. Socket is an ultra cheap single wipe tinned socket. The contact for the flaky select line in the socket is visibly damaged.

First repair and analysis: Crappy single wipe socket is desoldered, and replaced with a decent quality double wipe tinned socket. LS139 re-inserted. On power up, disk ROM is still not seen. However, on attempting to read contents of ROM using simple FOR / NEXT loop PEEKING the CHR$'s at locations $C000 and up, I this time get data. However, it is not the correct data. Close examination of the data shows that it differs from correct Disk ROM data in that bit 1 (second data bit) is ALWAYS STUCK HIGH. This is consistent with the second data bit being NOT CONNECTED somewhere along the line.

Continuity Test results: Using an ohmmeter set to RX10, I checked out continuity between the 40 pin edge connector and the appropriate pins of the LS245 chip. This reveals exactly what I expected to find: No continuity between land #11 (data bit 1) and pin 18 of the LS245 (data bit one). VERY VERY close inspection of the trace involved shows, in a 20X magnifier, a HAIRLINE break in the trace just in the vicinity of where some desoldering was done to an adjacent pad.

Second repair and results: I soldered a jumper in place bridging the broken trace. Then powered up the Multipak with disk controller in slot 4 and slot 4 selected. BINGO! Disk Extended Basic appears on screen. Disk controller and disk drives work properly.

Final repairs: I now replace the four additional crappy single wipe sockets used by Dan. And I replace the 74368

chip Dan used with a lower power 74LS368 chip, and replace a few short pin chips Dan had in the sockets (presumably the very chips Dan desoldered) with new, full length pin chips.

Results: Reliable, working Multipak interface, with all logic chips socketed.

Comments: (1) If you are going to spend the time needed to desolder and socket a chip, ALWAYS use high quality sockets!!! The price difference is small (the double wipe sockets I used cost about 25 cents each or less). I actually recommend using even higher quality (gold plated machine pin) sockets. These may cost a buck or so each, but considering how much time you will be putting in to desoldering sockets, you might as well use the best. In any case, NEVER EVER use single wipe tinned sockets. They are NOTORIOUSLY unreliable.

(2) If the device in question is one whose function in the computer system is understood by use, it is VERY helpful to use simple little programs (like the PEEKing of the Disk ROM and repeated changing of the software slot selector in this situation) combined with a logic probe to figure out what is going on.

Overview: This repair took me about 2 and a half hours to complete, including replacing all SIX lousy single wipe sockets Dan had used. Given the going rate for a used Multipak or Slot Pak, that makes it NOT WORTH MY TIME to repair. I did the repair primarily as recreation, just to test my own diagnostic skills in this case. Time I spent on it I would compare to time one spends doing a crossword puzzle... NOT to time one spends "at work". A bench technician would have to charge you $60 an hour or more for such repair. The Multipak is hardly worth $150 + $15 = $165 !!

－－DELPHI－－

Corrections . . .

Last month's article "MM/1 at Rainbowfest" had part of the last sentence missing:
DMA stereo sound is working, so is the MIDI port hardware in prototype form.

2MEG's of RAM

When Tony Di Stefano designed his 1 meg upgrade for the CoCo3, he had HOPED that he could eventually lay hands on 4 bit wide by 256K DRAM chips that could be refreshed with a 256 cycle refresh, allowing them to be used with the GIME chip's memory manager. With those chips, one could build a 2 megabyte memory board using a total of only 16 chips, the same number of chips currently used in a 512K CoCo 3 memory upgrade board. With this in mind, Tony decoded on the "CPU board" of his 1 meg upgrade BOTH of the two "missing" GIME chip memory manager bits. He used only ONE of those two bits (the low order one) for decoding the 1 megabyte of memory his product was specked to provide, but his CPU board DOES decode the second (highest order) missing MMU bit. Over time, Tony realized that there were NO one megabit DRAM parts made that could be refreshed with the GIME chip's 256 cycle refresh. Whether by mistake or design, Tandy in its layout of the GIME chip had effectively prevented the use of high density DRAM chips with 1 or more megabits of memory per chip.

Faced with this reality, Tony decided that it would be foolish to attempt a 2 meg upgrade. A 2 meg upgrade would require a total of SIXTY FOUR 256K by 1 chips. That means 48 more loads on each address line buffer of the CoCo 3 than was originally planned by the designers! Apart from the physical problem of where to PUT all those chips, one was faced with the near certainty that the address and data buffers of the CoCo 3 would not be able to handle that much fan out. Tony wisely decided that 1 meg was enough.

Enter the Mad Hacker:

There's always at least one crazy person who, upon being told something is impossible, will bend over backwards to show it is not. There may have been one or two BEFORE the story I am about to tell you of, but

I am familiar only with this one story. While there may have been previous successful Coco 3 2 meg upgrades, this one is significant because it has been widely and explicitly publicized through Delphi's OS9 and CoCo SIGs (THE place to be for CoCo 3 hardware news), and provoked within days of its announcement two other successful 2 meg upgrades to be done. I told my friend Dennis McMillian (COCOKIWI on Delphi) about the fact that the second bit was decoded. I also told him exactly how the decoding of the CAS line (that is used as a 512K bank select) is done on the Disto CoCo 3 1 meg memory upgrade board. I told him, however, that he would be foolish to try to do a 2 meg upgrade, because of the "fan out" problem I spoke of above. Dennis set out to prove me wrong.

Dennis noticed that adding sixteen more chips (as in the official 1 meg upgrade) did NOT result in a fan out problem. Therefore, empirically, he could rely on a fan out for a total of 32 chips. He then checked out specifications for TTL logic chips, and noticed that the rated output fanout for 74F series chips was 2.5 times that rated for 74LS series chips.

Dennis proceeded to replace destructively remove FOUR twenty pin IC's from the CoCo 3's main board: IC10, 11, 12, and 13. These are one LS374 and three LS244 chips. He then soldered on sockets where those chips used to be, and inserted F244 and F374 chips in place of the LS series chips. Now his CoCo's data and address buffers were not only faster (which is of help in getting around the delays introduced by the 1 meg upgrade board) but also had 2.5 times the output drive, and so could reliably drive over twice the number of memory chips.

We found that the 74F139 chip on the Disto 1 meg board was used to do the bank selection. It had the input pins 2 and 3 shorted together. You need to BREAK the short between those two pins, then send the low order bank select line (the line from the CPU board that formerly went to J5 on the memory board) to pin 2, and

the high order bank select line from the Disto "CPU board" to pin 3 of the F139 on the Disto 1 meg memory board.

The high order bank select line is located on the Disto "CPU board" on the four pin connector J2. On that board, as you go from the end of that connector labelled "J2" to the end near the word "OUT", the pins are as follows: +5 volts, lower order bank select bit (used with normal 1 meg upgrades), ground, higher order bank select bit (used only with 2 meg upgrades).

Now that you have re-wired the INPUTS to the bank select chip for 2 meg operation you must wire up the extra 32 memory chips. THIS is a delicate operation. You must PIGGY BACK the additional 32 chips ON TOP OF the existing 32 chips that currently populate the two boards in your one meg upgrade. Alternatively, you can do "4 stack" and make quadruple piggy backs of memory chips, and then use ONLY the Disto one meg board. In any case, each extra layer of chips must have pin 15 (CAS, used as a bank select) bent out. And have those pin 15's all wired to each other for each 16 chip bank. Thus, you have added two new CAS bank select lines. One goes to pin 6 of the F139 chip on the disto memory board, and the other goes to pin 5.

Note that the first 512K will be selected by pin 4 of the F139, and will be found in the PHYSICALLY LOWER bank of chips on the Disto memory board. Pin 5 selects the next 512K bank, and pin 6 selects the bank after that. Pin 7 is currently wired so that it goes to the physically lower bank of chips (original bank of chips) on the memory board that is plugged IN to the Disto memory board.

Users on Internet and Delphi OS9 SIG can tell you how to patch the OS9 kernel so that it will recognize all 2 megs of memory. This procedure is VERY tedious, highly experimental, and subject to numerous ways it can fail. It requires VERY good soldering and desoldering technique, and should NEVER be attempted by ANY except the MOST experienced hard-

ware hackers! However, I now have THREE reports of successful 2 meg upgrades. Other Hints: DO NOT USE other than 120 or 150 ns rated DRAMs. Faster chips (80 or 100 ns) have been reported to NOT WORK in either one or two meg upgrades. Bruce Isted and Dave Myers (CoCoPRO!) have both told me about this. You may wish to use NEC brand chips. You MAY wish to try using CMOS instead of NMOS DRAMs to hold down power consumption. Bruce Isted suggests, if you have problems, you may wish to use different memory chips, and you may wish to try shorting out the 120 ohm CAS resistors on the CoCo 3 board, and instead inserting 120 ohm CAS resistors for each bank of memory between the relevant pin of the F139 chip and the CAS lines on each bank of memory chips.

The best source I know of for CHEEEP memory chips is an electronic chip SALVAGE company called FOX Electronics. 120 and 150 ns SOLDER PULL (be sure to specify long pins if possible!) 41256 DRAMs sell for about 50 cents each there. They can be reached at 408-943-1577, or at 2558 Seaboard Ave, SAn Jose, CA 95131. Ask for "Woody" and tell him Marty Goodman sent ya. Prices and availability and chip brands will vary from day to day, so CALL before you order!

I personally regard this upgrade as a HIGHLY impractical, tedious, and potentially dangerous and flaky thing to do. However, as I noted, at least three folks have successfully done it, and CLAIM their computers are running completely reliably.

Given how experimental this procedure is, PLEASE report your successes or failures to CoCo users at large via the Internet Mailing List or Delphi's OS9 or CoCo SIG. I can be reached on Delphi as username MARTYGOODMAN and via Internet at address: MARTYGOODMAN@BIOTECHNET.COM.

"Auto Boot" OS-9

Here are the plans to burn a 27C256 eprom to replace your COCO 3 internal ROM with changes to autoload OS9 from power-on.

I wanted to autoboot without taking away anything from the original RS DECB system. So, with that in mind, I came up with the idea to replace the area of COCO 3 ROM used by the graphic data of the 3 Microware programmers. (Sorry, boys!)

Track 34 of your OS9 system disk holds the modules REL, BOOT, and OS9P1. This code is loaded by the "DOS" command into location $2600. The code is entered and after a bit of housekeeping is RELocated to its rightful position $ED00. OS9P1 then takes over and loads the rest of the boot from your system disk using the BOOT module.

As you may know, the COCO 3 ROM code uses the CTRL and ALT key depression when powering up to display the Microware boys. I took over the code for this test and directed the system to jump to BASIC when it saw the CTRL and ALT keys depressed. Without the keys being pressed, the system jumps to our rom based OS9 bootloader.

The actual code changes to ROM are small, as listed below, but you must arrange to get your $1200 bytes of track 34 into position starting at $4405. (This is where the data for the 3 amigos started.)

The code changes needed for making a new rom are:

Relative Addr	Original	New
4038	C3	D6
4039	6C	05
40B9	27	10
40BA	07	27
40BB	31	01
40BC	3F	33
40BD	26	31
40BE	F2	3F
40BF	16	26
40C0	01	F0
40C1	2E	12

41F0	4F	30
41F1	B7	8C
41F2	FE	B5
41F3	ED	CC
41F4	97	43
41F5	71	C8
41F6	B7	ED
41F7	FF	00
41F8	DE	16
41F9	C6	FE
41FA	09	C7

Here begins the Track 34 data.   4F

4405	4F
	53
	20
	5B
	12

CONTINUES -

Replacing the ROM in your Color Computer 3 might be a little much for some people. You must use a desoldering tool to take out the old ROM. (This can be simplified by cutting the unit out first and then using a desoldering tool to clean up.) However you do it, be careful not to damage the foil traces. Install a 28 pin socket to hold the eprom.

Install your boot disk in /D0 and close the door. Turn on the power and watch as the screen will flash green for just a split second and then the blue screen with "OS9 BOOT" will appear.

What about track 34? No longer needed. I used the disk editor, DED, to replace the sectors back into the GAT table. I'm working on a patch to OS9GEN to skip the part where track 34 gets loaded.

If you don't own or have access to an eprom burner, I would be happy to make one for anyone wishing. You pay for the eprom and the return shipping. 27C256 eproms cost about $5.00 and shipping would run under a dollar, (USMAIL). So, send about six bucks to:
Steve Hilton
612 Chateau Circle
Burnsville, MN, 55337

You'll receive a standard version of the OS9 bootloader. If you want a doctored up version, send me a message saying what changes you want. If its just a couple of bytes, I can handle that, but I don't have the time to remake major changes.
-Steve Hilton-

Convert your MODEMPAK to RS-232 PAK

I found this a great way to get a piece of hardware that I could not find anywhere from some piece of junk (I thought completely useless) that was lying around collecting dust.
Parts list:
1 Direct Connect Modem Pak
1 ICL232 CMOS chip (maybe two)
4 22 microfarad electrolytic capacitors(X # of ICL232s)
1 male d-sub 25 connector
1 small bread board

Depending on what kind of setup you have now you may also need a new cable for this. If you were using the bit banger before, then you'll also need a female d-sub 25 connector to change your present cable or for around $15 you could go buy one.

If you want all the lines for a TRUE RS232 port you'll need two of ICL232 CMOS chips. However, one will do the job just fine giving you transmit, receive data, carrier detect and the data terminal ready lines.

I chose this I.C. because it does not need +12v, and -12v to operate, and has send and receive buffers in one chip. The RS232 Pak sold by Tandy required a Multi-pak or a Y-cable with a power supply. So, as far as I know, this conversion will not need a Multi-pak.

If you cannot find this I.C., it can still be done using a MC1488, and MC1489 RS232 driver, and receiver respectively. Unfortunately, I cannot tell you exactly how that would be wired up since I tried it that way first and I failed. However, someone else has done it and plans to pass around what he has done soon.

The hardest part (I thought) is first, strip everything from the board EXCEPT the following parts:

IC2,IC3,IC4
6551A,74LS133,74LS04
X1   1.8432 MHz crystal
C3,C11,C12,C13,C18   .1 ufd caps
C1   100 ufd cap
R1   4.7k resistor
And the little diode or whatever it is on the back side of the board that's connected to pin 27 of the 6551 (IC2).

I'm not sure if taking everything else out is actually completely necessary, but mine didn't work until I did. If you're having troubles getting things out just cut the traces that go anywhere from that part. Then to change the addressing to what the RS232 pak is seen by:
1. Cut the trace going to pin 2 of IC2 (6551A).
2. Run a wire from that trace (the first through board connection what was from pin 2 of IC2) and connect it to pin 1 of IC4 (74LS04).
3. Take a wire from pin 2 of IC4 to pin 2 of IC2.

Now any hardware looking for an RS232 pak will see the modem pak as such. Then we have to fix up a couple things:
1. Cut the trace from pin 16 of IC2.
2. Run a wire from pin 1 of IC2 to pin 9 of IC2

Now comes the last step. This can be done on a small bread board, or as I did using the existing holes in the board where IC5 (74HC943) used to be. I made sure no traces were left connected to any of the holes, and soldered a socket in there, from there I ran my wires. This may be difficult if you do not have a de-soldering pump to clean out the holes, but it leaves lots of room. The first one I converted had a small bread board crammed in there with a rat's nest of wires all over the place, not very aesthetic, but effective.

The pinouts of the ICL232 are as follows:

C1+	1:	--	:16	Vcc
V+	2:		:15	gnd
C1-	3:		:14	T1out
C2+	4:		:13	R1in
C2-	5:		:12	R1out
V-	6:		:11	T1in
T2out	7:		:10	T2in
R2in	8:		:9	R2out

1. Run a wire from the + side of C1 to Pin 16 of the ICL232.

2. put a 22 mfd cap across-pins 1 and 3 of the ICL232 (- side to pin 3) pins 4 and 5 of the ICL232 (- side to pin 5) pin 6 and gnd pin 2 and 16

3. Make the following connections:

IC2   to   ICL232

pin 11	pin 10
pin 10	pin 11
pin 12	pin 12
pin 16	pin 9

4. Make the following connections:

ICL232   to   d-sub 25

pin 14	pin 2
pin 7	pin 20
pin 13	pin 3
pin 8	pin 8

5. connect pins 1 and 7 of the d-sub 25 connector and run a wire from them to ground.

If you want all the other RS232 lines. Use another ICL232 in the same way for the following lines:

6551 (IC2)		D-sub 25
RTS	8	4
CTS	9	5
DSR	17	6

The rest of the lines are not important as far as I know. But I don't know much about this. If you like things done properly, you'll probably take this one step further.

That's it, put it back together, and try it out. It should work in both OS9 and RSDOS. If I have made a mistake or anyone wishes more info, please let me know.

−WESGALE;Delphi−

Club Activities

Bellingham OS-9 Users Group

Rodge Alexander, Craig DuBois and Ray Flick made it down for the NW CoCoFest in Port Orchard and had lots of fun (even if the wifes were along). The club's video tapes wer a big hit and the club took in $35 in sales of video tapes, Public Domain Library Disk and OS-9 Tutorials. Two more "Hardware How To" video sessions will be scheduled during July. No specific meeting date or location has been scheduled for the July meeting.

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Longview/Kelso CoCo Club

No report available. Contact Mark Johnson on Columbia Hts. BBS for Longview/Kelso CoCo Club meeting dates and tme.

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Seattle 68xxxMug

Meetings are held the first Tuesday of the month at Gugenhem Hall on the University of Washington Campus at 7:30 p.m. The agenda for the July 2nd meeting is a demonstration by Rodger Alexander of converting a Modem-Pak into an RS-232 Pak. Also, several sftware demonstrations, including HOME PUBLISHER, PTFile Management, and an OS9 Menuing environment.

Pictures and reports on the NW CoCoFest will also be presented.

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Mt. Rainier CoCo Club

Donald Zimmerman gave an update on the cocofest scheduled for June 21-22 at Port Orchard. Following Don's report we had a demonstration of an OS9 text utility called VIEW which allows you to scroll up and down and sideways and do a screen dump to the printer of the text you are VIEWing. VIEW is written by Vaugh Cato. It replaces list on our system because it

doesn't abort on a module. Agenda for the July meeting was not available.
−John Schliep−

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Port O'CoCo Club

The June 20th meeting was devoted to confirming all materials and arrangements were made for the NW CoCo Fest hosted by the Port O'CoCo Club. Don Zimmerman provided the last minute status report and assigning individuals to help out collecting rgistration fees and the presentation of the NW CoCoFest Mug were all attended to. Everything was in preparaton for the weekend event.

The July meeting will be a continuation of Mark King's presentation on C Programing and a viewng of the Bellingham OS-9 Users Group's video tapes.