

# OS-9 Newsletter

Volume IV Issue 2

Bellingham OS-9 Users Group

February 28, 1992

## OS-9 Parallel Printer Port

Hardware Project



### Parallel Port for the CoCo?

Why not. It's easy and cheap. Software was the only problem for me and now that's solved. So get out your soldering gun and rip the case cover off you CoCo. This one is going to be easy. <grin>

#### HARDWARE REQUIRED:

- 40 pin IC socket (RS Cat.# 276-1996)
- 68B21 PIA chip (found at most electronic supplies)
- 7404 hex inverter (RS Cat.# 276-1802)
- DB25 for IBM type cable (RS Cat.# 276-1565)
- or 36 pin Centronics type (RS Cat.# 276-1533)
- 25 or 36 conductor flat ribbon cable (RS Cat.# 278-772)
- thin hookup wire (30 gauge)
- double sided tape (RS Cat.# 64-2343).

**THEORY:** A parallel printer interface functions by placing a byte of data into a parallel latch, then bringing the DATA\* handshake line low for a brief period of time so that the printer knows that data is available on its input bus. When the printer has received the data it asserts ACKNG\* low to tell the computer that it has received the byte of data. It also unasserts BUSY (= low) at this time. Since BUSY can indicate many other off-line or similar conditions (such as a line-feed in progress), It is necessary to monitor the state of the BUSY handshake line with this interface. The FAULT\* line asserted low by the printer indicates a printer malfunction. If PE\* is high in addition, the printer is out of paper. PRIME\* asserted low by the interface empties the buffer and resets printers that use it.

**SOFTWARE THEORY:** This driver functions by simply interrogating the parallel interface to see if the printer is ready to receive data. If it is, it sends the byte that was passed to it. If it is BUSY, it loops back and tries again. If a FAULT\* signal occurs from the printer, the driver tests for two conditions, no paper (PE) or general error. (The addition of a new error code for Paper Out. ESPaper. (#199) allows the Printerr function to display this. If you use *Printerr* or *OS9p3*, be sure to add an appropriate entry to your Errmsg file in the SYS directory.) If either of the conditions are detected, an error is returned. The only Getstat call supported is "Device Ready". During initialization a PRIME\* pulse from the interface to the printer is provided for printers that utilize it.

#### ADDITIONAL:

The device descriptor (P1) included in this article contains no new surprises. The base address of the interface PIA is in the device descriptor -- no hard-coded stuff in this one -- so that you can change it as needed to match your hardware. There are a few unused lines on the port that you could use for other applications as needed.

**SUGGESTED REFERENCES:** *Investigating the PIA* by Tony DiStefano (July'86 *RAINBOW*). *Starman DOS, Cooking with CoCo* by Colin Stearman (Dec'84 *RAINBOW*). *Color Computer-3 Technical Reference Manual*.

**CONSTRUCTION:** Study the schematic diagram (figure 1). Note the asterisk (or stars) located next to pins 1, 20, 21 - 23 and 25 - 40 on the 68B21 PIA chip. The stars indicate the pins on the 40 pin IC socket that are soldered to the original 68B21 PIA chip in the CoCo, labeled IC4 (at least that's what it says on my CoCo-3). All of the pins that are not marked with a star should be bent up so that when the socket is placed over the PIA (IC4), the socket pins will not come in contact to the corresponding pins on IC4.

On the original PIA (IC4) solder a 4 inch length of small hookup wire to pin 24. This is one of the Chip Select pins (CS2). When this pin has a low logic level voltage applied to it, the PIA is enabled.

### << - In This Issue - >>

<b>OS-9 Parallel Port piggyback fashion for the CoCo</b>	<b>Pg. 1</b>
Easy hardware project - Software included	
<b>Bernie's Bit-Bucket: Review of VEd 2.0 for 68K</b>	<b>Pg. 4</b>
The return of Bernie Beshers's informational "Bit Bucket"	
<b>OS-9 Gossip: Tony DiStefano is back!?</b>	<b>Pg. 5</b>
Disto is about to market a 2 Meg Memory Expansion Board	
<b>CoCo Wish List: Chris Burke wants to know</b>	<b>Pg. 5</b>
Burke & Burke wants to manufacture what you want to buy	
<b>Booster 2.0 vs NitroS9</b>	<b>Pg. 6</b>
Native mode configuration software for the 6309	
<b>Amiga's 4000DSP: Technical Report</b>	<b>Pg. 6</b>
Comparative report on Amiga's DSP chip and Atari's DSP chip	
<b>Questions and Answers</b>	<b>Pg. 6</b>
PoCo LCD Screen - Broken Hard Drive - B&B XT - 32MHz Xtal	
<b>C-Compiler: Compiling Instructions</b>	<b>Pg. 8</b>
Compiling Command Syntax	
<b>CD-I Compact Disk Interactive</b>	<b>Pg. 9</b>
<b>Local Club's Activity Reports</b>	<b>Pg. 10</b>

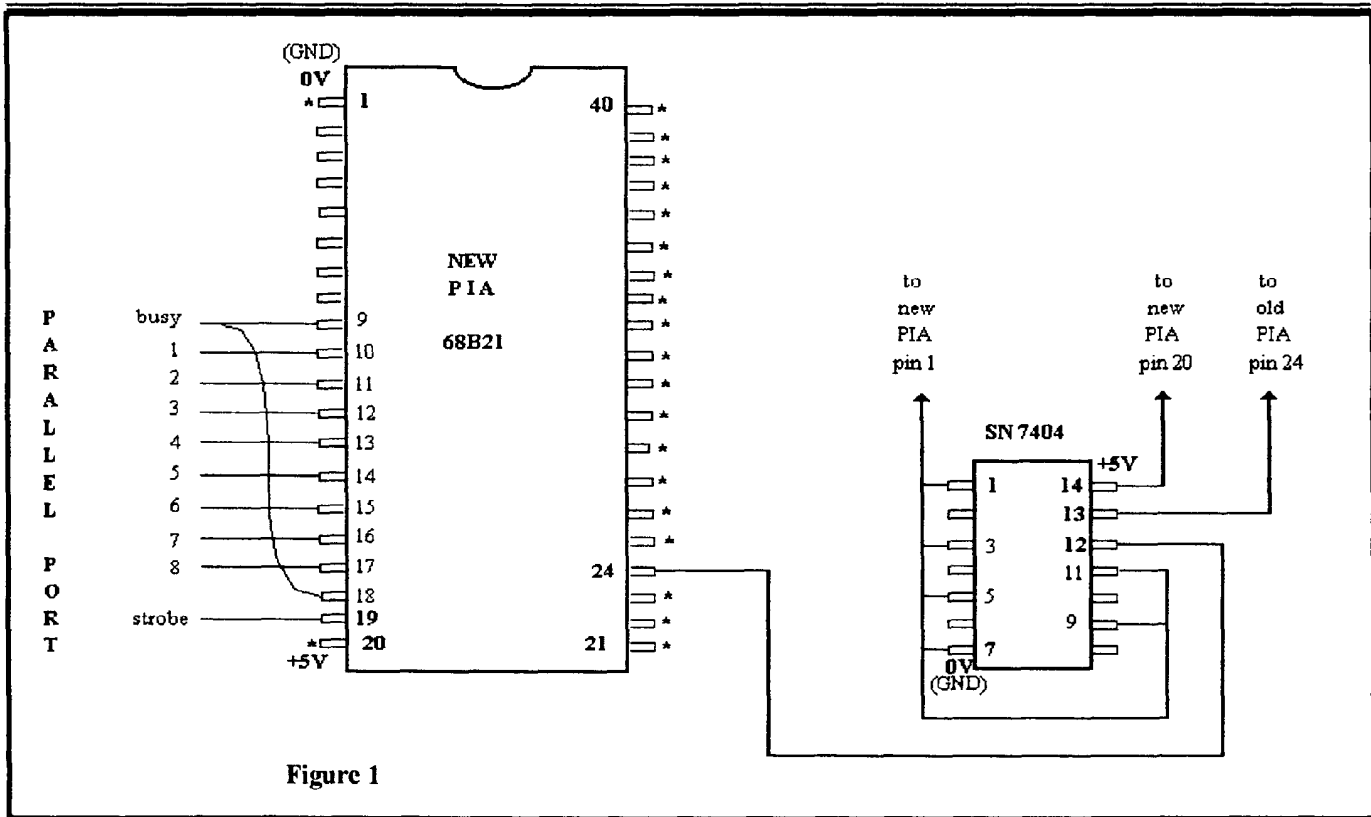


Figure 1

Press the 40 pin IC socket over the top of IC4 and solder socket pins 1, 20, 21 - 23 and 25 - 40 to the corresponding pins on IC4. Solder a 4 inch length of thin hookup wire to socket pin 24.

You can connect your parallel I/O lines on the 40 pin socket directly to a Centronics type male plug with 36 conductor flat ribbon cable or connect your parallel I/O lines to a female DB25 type plug using 25 conductor flat ribbon cable. In either case, solder the wires to the 40 pin IC socket as indicated in table 1.

Conductor #	Function	IC Pin #
1	Data Strobe	19
2	Data Bit 1	10
3	Data Bit 2	11
4	Data Bit 3	12
5	Data Bit 4	13
6	Data Bit 5	14
7	Data Bit 6	15
8	Data Bit 7	16
9	Data Bit 8	17
11	Busy	9 and 18
14	Signal Ground	1 (or any GND point)

**Table 1**

Now plug your new 68B21 PIA chip into the socket being careful that all of the pins insert properly.

Cut a piece of double sided tape to the appropriate size in order to mount the hex inverter chip (7404) upside down on the CoCo mother board between R16 and R7, approximately 1

inch to the left of the PIA (IC4). This is an unused section of the motherboard just the right size for the 7404 chip. With short lengths of thin hookup wire, connect pins 1, 3, 5, 7, 9 & 11 of the 7404 chip to pin 1 of either of the two PIA chips or any other convenient ground potential on the CoCo motherboard. Connect pin 14 of the 7404 chip to pin 20 of either of the two PIA chips or any other convenient 5 volt potential.

Solder the free end of the wire connected to pin 24 of the original PIA chip (IC4) to pin 13 of the 7404 chip. Solder the free end of the wire connected to pin 24 on the 40 pin socket to pin 12 of the 7404 chip.

**CIRCUIT THEORY:** The original PIA chip in the CoCo is addressed at FF20 (hexadecimal). As long as the Chip Select lines are set correctly (CS0, CS1, CS2) the PIA is active. CS0 and CS1 are high active inputs and are hard wired to a high logic level. However, the logic level applied to CS2 (a low active input) is controlled through Address Line 2. If the CoCo is using FF20 as the current I/O address, Address Line 2 will be at 0 (low logic level), CS2 will become active and the PIA will be enabled.

If we use FF24 as our I/O address, Address Line 2 will be set high and CS2 will disable the PIA. However we also have a hex inverter on Address Line 2 with it's output going to CS2 on the new piggy backed PIA. The inverter inverts the high level state on Address Line 2 to a low state and applies it to CS2 on our new PIA and enabling our parallel port.

**SOFTWARE LISTING:**

Type in the following assembly code listing and assemble with the OS-9 Level-I ASMmbler: "ASM #10k p1.src o"

## Parallel Printer Descriptor

\* A device descriptor for a parallel printer interface.  
 \* Does not use extra Lines or Chars bytes.

```
nam P1
ttl A device descriptor for LPrint.
ifpl
use /h0/defs/defsfile
endc

tx mod Theend,DscName,Devic+Objct,Reent+1
fdb MgrName-tx
fdb DvrName-tx
fcb UPDAT. mode byte
fcb 0,$FF,$24 device extended address
Table fcb Etable-Table table size
fcb 0 Scf-type device
fcb 0 upper and lower case allowed
fcb 0 backspace-space-backspace mode
fcb 0 don't delete line by backspacing
fcb 0 echo off
fcb 0 no auto line feed
fcb 0 null count = 0 for end of line
fcb 0 pause off
fcb $42 66 lines/page
fcb C$BSP backspace character
fcb C$DEL line delete character (CNTL-X)
fcb C$CR end of record char. ($d)
fcb 0 no end of file character ($1b)
fcb C$RPRT reprint line character (CNTL-D)
fcb C$RPET repeat line character (CNTL-A)
fcb C$PAUS pause character (CNTL-W)
fcb 0 no keyboard interrupt (CNTL-C)
fcb 0 no keyboard abort (CNTL-E)
fcb C$BSP backspace echo character
fcb C$BELL line overflow charater (7)
fcb 0 type byte not used
fcb 0 no baud rate for parallel port
fdb DscName-tx secondary device name pointer
fcb 0 no Xon byte
Etable fcb 0 no Xoff byte

* Device name strings.
DscName fcs /P1/
MgrName fcs /SCF/
DvrName fcs /LPrint/

emod
Theend equ *
```

## Parallel Print Driver

```
nam LPrint
ttl A parallel printer interface driver.

* A parallel print driver for a MC6821 PIA.
* Development begun: 10/21/88
* Final Revision: 03/12/89.
* By: Duane Penzien.
* Data written after first checking FAULT* and...
* ... BUSY status. If FAULT*, an error return is
* performed.
* NOTE: Uses interface scheme defined below.

* Interface Table:
*****
* PIA PRINTER DIRECTION** *
*-----*
* pa0 | BUSY | input *
* pa1 | PE | input *
* pa7 | FAULT* | input *
* pa6 | PRIME* | output *
* cb2 | DTSB* | output *
* pb0-7 | DATA0-7 | output *
```

```
* GND | GND | both *
*-----*
* NOTES: * = active low signal. *
* ** = relative to PIA. *
*****

ifpl
use /h0/defs/defsfile
endc

mod Size,Name,DRIVR+OBJECT,REENT+1,Start,Datend
rmb V.SCF leave room for SCFMan
PIAporA rmb 2 pia port A pointer
PIAconA rmb 2 pia A control register pointer
PIAporB rmb 2 pia B port pointer
PIAconB rmb 2 pia control B pointer
rmb 100 stack space
Datend equ . end of data storage

fcb EXEC.+UPDAT. mode byte
Name fcs /LPrint/
Start
lbra PIA.ini
lbra PIA.rd does nothing...
lbra PIA.wrt
lbra PIA.gst one valid call
lbra PIA.sst illegal svc calls
lbra PIA.trm needs to do nothing, does nothing

PIA.ini
ldx V.port,u get PIA base address
stx PIAporA,u save it in table
leax 1,x set to A control reg.
stx PIAconA,u save it in table
leax 1,x set to B port value
stx PIAporB,u save it
leax 1,x set to B control reg.
stx PIAconB,u save it
clr empty an 8-bit regiser
sta [PIAconA,u] reset A side for programming
sta [PIAconB,u] reset B side for programming
coma make A=$FF
sta [PIAporB,u] B port all outputs (data)
anda #01000000
sta [PIAporA,u] A port inputs except *prime
eorA #01000100 A is now binary 4
sta [PIAconA,u] lock DDRA, nothing else active
ora #00111000 set up for B side
sta [PIAconB,u] lock DDRB, cb2 set output (high)
ldx #2 wait for busy
os9 F$sleep sleep before un-prime
lda #01000000 load prime-off byte
sta [PIAporA,u] make sure prime released
clrb no errors on exit
rts done with setup

PIA.wrt
ldb [PIAporA,u] get printer status
bmi PIA10 if b7=1 (not FAULT*) no operation errors
andb #00000010 filter for PE error
beq OFFline if not PE, go on
ldb #E$Paper else paper error
bra PrinErr goto error exit
OFFline ldb #E$NotRdy all other errors are this
PrinErr orcc #Carry set carry flag
rts exit with error
PIA10 lsrB check for busy status
bcs PIA.wrt if busy, loop once again
sta [PIAporB,u] else put data in buffer
lda [PIAconB,u] get control data
anda #11110111 set cb2 output low
sta [PIAconB,u] strobe data to printer
ora #00001000 set cb2 output high
sta [PIAconB,u] strobe off
clrb no errors on exit
rts return to sender
```

```
PIA.gst
  cmpa #SS.Ready device ready call?
  bne PIA.sst no match, illegal call
  lda [PIAporA,u] get status info
  bpl Gst10 if fault, report not ready
  clrb else no errors
  rts return that way
Gst10 ldb #E$NotRdy not ready code
  bra Sst10 goto error exit
PIA.sst
  ldb #E$UnkSvc unknown service request
  Sst10 orcc #Carry set carry flag
  rts return with error
```

```
PIA.rd
PIA.trm
  clrb no errors on calls
  rts return
```

```
* Subroutine: Incstep
* Increments/Resets B counter.
Incstep
  incb add one to B
  bpl Inc10 not end, don't reset
  clrb else reset B
  Inc10 rts end of routine
```

```
emod
Size equ *
```

#### FINAL COMMENTS:

I originally had this type of set up in my old grey CoCo-I F-board running Stearman DOS burned into an EPROM. I knew that it must be possible to do the same type of piggy back hardware modification to the CoCo-3 using OS-9. Writing the driver and descriptor was the barrier that prevented me from accomplishing this objective. I finally found a file on Delphi called LPRINT.AR by Duane Penzien in the OS-9 Sig. Now the software problem is solved.

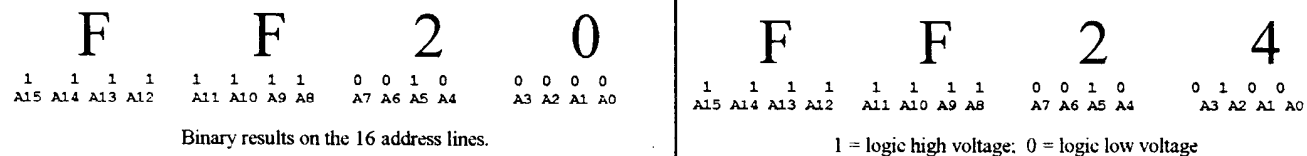
Duane originally intended to mount the PIA on a circuit board plugged into the Multi-Pak. He had concerns about loading down the un-buffered bus in the CoCo, but since I'm using the 6309 low current CMOS CPU, I'm not worried about the loading factor.

If you don't have the Level I assembler, I will gladly supply both the compiled descriptor and driver. Just send me a blank disk with return postage.

One last thing. I have included a Hex to Binary chart that illustrate how changing the address from FF20 to FF24 takes care of the high/low logic state on Address Line 2 that enables the new PIA.

== Rodger Alexander ==

### CoCo Serial Address



*Bonnie's*  
"BIT\_BUCKET"

#### Spell-checker:

I've used the spell-checker on documents I had previously checked with DynaSpell and found words that DynaSpell missed. To activate the spell-checker one first hits the <esc> key then hits the number <1>. You are then presented with a menu of choices including looking up the current word, spell-checking the document from the cursor onward, auto-checking, and a couple other choices. You can use the mouse to select, you can select by hitting the capitalized letter, or you can use the arrow keys to highlight your selection and then hit <enter>. The text is then read a word at a time, highlighting each word (man is it ever fast!) and stopping at any suspect word. When Bob's spell-checker suspects a word it again gives you several options, among which are look-up, accept, ignore, and quit. When you accept a spelling it is loaded into a buffer and you don't have to bother checking that

word again. When you ask to look up the word you are presented with both spelling and phonetic options and given the ability to change the spelling of your word by pressing a <y>es or look at another word by pressing <n>o.

#### Mouse:

I described the program as being "mouse assisted" because it couldn't really be called "mouse driven". There is no Menu Bar across the top of the screen so all menus must be called by a hot-key combination. Besides being able to select from the menus with point & click, the mouse can be used to select a file from the directory when calling VED from the keyboard, and for rapid placement of the cursor on the screen. With the VED version 1.x one had to move the cursor a letter at a time by arrow keys or use <ctrl>+<J> or <K> to go forward or back a word at a time. Using the mouse for cursor placement is a big improvement. I'm guessing that a future version of VED will allow a menu

Many old time Color Computer users became familiar with Bob van der Poel's work thru various flavors of the TelePatch improvements to TeleWriter-64 and thru his TeleWriter-128. Those of us who liked his CoCo word Processors were delighted when he produced VED for OS-9 Level 2 and then for OS-9 68000. He has now upgraded VED 68000 to version 2.0 and boy is it ever a honey!

Versions 1.x of VED 68000 had an integrated formatter with embedded printing commands and they performed roughly equal to TeleWriter-128. The big difference between versions 1.x and version 2.0 is that the latest product also includes an excellent built in spelling checker and is "mouse assisted".

Bernie's Bit-Bucket

bar to be called or shown in some manner. Maybe by pressing the middle button on the mouse. Maybe we'll be given the option in the ved..env\_file.

The Future:

One thing is for certain, Bob van der Poel's mind is so active that he won't rest until he has achieved the ultimate word processor for the entire computing world. He achieved perfection in the world of formatters with VPrint and he is very, very close in the world of processors with VEd 2.0. Am I being critical of VEd 2.0 because it isn't totally mouse driven? NO! Certainly not. I recently had an opportunity to use a MacIntosh with "Microsoft Word" for a word processor. Since the MacIntosh has neither arrow keys nor easily remembered hot keys, about all I could do was struggle thru what I needed to write and go home feeling smug because I owned a much better word processor at about 20% of the price! I do feel, however, that Bob will eventually go to full "mouse driven" ability because of it's ease of use by beginners and to reduce the learning curve of those using VEd in an office environment where time is money.

VEd is a great word processor at a fantastic price. Bob van der Poel's customer service is the greatest. Combined with Bob's VPrint formatter I now have the ultimate combination to control the looks of my printed words and I'm dealing with a software author who will be around for many years to support his products. There are many more features than I have addressed, but I don't want to use up valuable space here. If you want to know more, write to me (SASE) or, better still, send Bob an order for VEd.

Bob van der Poel Software  
PO Box 355 PO Box 57  
Porthill, ID Wynndel, BC  
USA 83853 Canada V0B 2N0

Price: \$59.95 + shipping

Bernie E. Beshorse (The Bit\_Bucket)  
P.O.Box 9381, Ketchikan, Alaska  
1(907)225-1324

## OS-9 Gossip

Shortly, DISTO will be putting on the market a new 2 Megabyte Expansion Memory card for the CoCo-3. Price will be \$99.95 plus postage/handling. The card takes 2 Simms of the 1 Megabyte variety to make the 1k memory board run. I have 512K now, but will be getting the new 2Meg card, and I suspect a lot of 512K cards will become available for very little.

Can't wait to use 2Megs on my CoCo-3! Even though I have 4Megabytes on my 386DX and OSK machine, I still get excited about the CoCo (with 2Megabytes)!!!!

AND to add to the excitement: CoNect is talking about their new FIFO UART RS-232 card that will really make modeming a lot better on the CoCo. No more loss of characters even at high speed communicating! .

== Jesse Newton;FidoNET ==

## CoCo Wish List

If you could have only one thing, what is it that you as a CoCo owner would want? Would it be:

- 1) More Level 2 OS9 applications
- 2) Specific kinds of hardware
- 3) A cost-effective way to migrate to the 68000
- 4) A reliable source of replacement parts (like floppy controllers)
- 5) The ability to break the 6809's 64K or 2MHz barriers
- 6) Something else specific

Anybody with an opinion is welcome to send me EMail, or regular postage. I'll tabulate results sent directly to me, and publish them. Call this market research if you like, but it's for the mutual benefit of all, whether they be users or vendors, that we set the future direction

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## OS-9 Newsletter

Editor: Rodger Alexander

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# Booster 2.0 vs NitROS9

by Boisy Pitre

While there has been much talk about NitROS9, there has been little to no mention of Chris Burke's enhancements to his PowerBoost software to allow 6309-based CoCo 3's to enjoy native mode.

Burke & Burke was the first company to come out with software that took advantage of the 6309's extra features. Chris has worked to bring native mode to OS-9 Level Two, and has written an excellent reference book on the 6309 processor which details both 6809 and 6309 op-codes in detail for the assembly programmer. I have this book and find it an invaluable programming aid.

In my opinion, PowerBoost 2.0 is a great package and is superior to NitROS9 in several respects. In fairness, I must state up front that I have not seen nor used NitROS9; however, I have talked one-on-one with Wes Gale, one of the package's authors, and am familiar with the native mode implementation of NitROS9.

The most notable difference between the two packages is in the implementation of native mode. While NitROS9 attempts to patch every module by re-coding the stack frame offsets on interrupts, Chris' approach is much simpler and more portable.

Instead of modifying every module in the system, PowerBoost 2.0 patches REL, BOOT, OS9P1, and OS9P2.

- REL is patched to put the processor in native mode.

- BOOT is patched to clean up the NMI stack frame and change the drive stepping delays on track seeks.

- OS9P1 is patched to rearrange the stack frame on an interrupt. There are several interrupt entries in the kernel, and PowerBoost accounts for these.

- OS9P2 is patched to facilitate the interrupt stack manipulation code in OS9P1.

The obvious advantage to this approach is that patching of drivers and other system modules (GRFDRV, CLOCK, etc.) is not necessary. If you have specialized drivers and no source code, it will work with Power Boost's native mode patches.

In addition, Chris has set aside location \$7C of the direct page system globals as D.Native, as a way of programs to detect which mode the processor is currently in. A value of 0 in this location signifies emulation mode. A non-zero value indicates the processor is in native mode.

To the best of my knowledge, NitROS9 does not support this system global, although doing so is very trivial.

I would suggest checking out Burke & Burke's PowerBoost 2.0 software. Not only is it \$5 cheaper than NitROS9, but its smarter and cleaner in its approach to implementing native mode.

Boisy Pitre:FidoNET

-- Rebuttal on page 9 --

# Q&A

**Q:** What's this about a lap top Color Computer????? Tell me more!

-- Frank Swygert --

**A:** The main thing you get with the *PoCo* is the LCD screen and driver board, the rest is up to you. You get instructions suggesting alternate cases and on how to make the CoCo battery operated. We could modify the whole thing for you for about \$550, with you providing a CoCo 3 outfit with disk controller and 3.5" drive. The screen and driver cost about \$300, but will plug into ANY RGB port and run. Can't use the port sync rates, they are generated on the driver board because of the low sync rate required by the LCD panel.

-- Curtis Boyle --

**Q:** My Seagate ST-225 20 Meg Hard Drive has suddenly stopped working. When I turn on the power it comes up to speed like normal, but the sound of the stepper motor engaging sounds terrible. Then the drive access light, which is usually green, starts blinking Morse Code at me in RED. I have even tried to reformat the hard drive but get a device not ready error.

-- Simon Farmer --

*Continued on next page*

## Amiga's 4000DSP

DSP stands for **Digital Signal Processor** and can process any wave pattern. In fact with a DSP chip, the Amiga and the Atari can "emulate" a complete MODEM with the DSP chip and software. Here's the latest scoop of the newest DSP chip.

**Here's the info on the AT&T 3210 DSP. Very Cool!**

There are three main distinctions between the DSP3120(Amiga 4000 DSP) and the MC56001(Atari Falcon DSP):

- **MATH:**

The DSP3210 does single precision (32-bit) floating point, the

MC56001 does 24-bit fixed point. For audio, you don't care. For lots of other stuff, you do.

- **BUS:**

The DSP3210 is a full 32/32-bit bus master. It can access memory directly, so many operations can take place without any CPU intervention. The MC56001 manages a private SRAM bus and requires the CPU (or other DMA device) to perform transfers in and out of this memory. So the CPU, or some CPU surrogate, is involved in all DSP operations.

- **OS:**

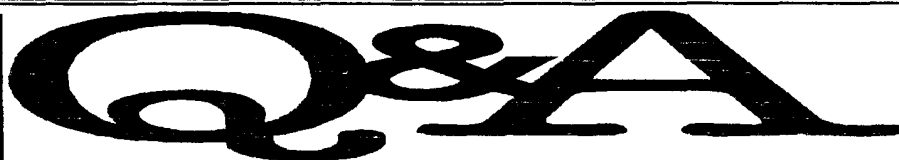
The DSP3210 is supported by a complete realtime multitasking operating environment, designed and promoted by AT&T. This includes a library of many DSP functions. There is no OS standard for the MC56001, and in fact

Motorola is behind most other DSP makers in at least getting the pieces in place for OS support. There's some question about running a real DSP OS on the 56001, these generally run on floating point processors. However, Analog Devices promotes a scaled-down version of the SPOX OS for its fixed-point DSPs, so in theory this could be done with the 56001 as well.

The DSP3210 will initially show up on the Amiga's local bus. This was planned for long ago; we started looking at DSPs over two years ago. Based on the realities of the NeXT's use of DSP versus its initial promise, it was decided that since "doing it first" had already been done, we'd instead "do it right".

The difference is that the DSP3210 will be doing the shuffling, not the CPU or DMA controller. And there's no need for audio data in Chip RAM if you're using a DSP-based audio subsystem, we expect DSP systems will have their own high quality audio CODEC. You would need to actually put a processed image into Chip RAM for display, but there's no requirement to process it in Chip RAM. --

Dave Haynie / Commodore Technology,  
High-End Amiga Systems Design



**A:** You're right about the blinking "RED" led light. It is sending an error message in code. This indicates that something mechanical has broken inside the drive, usually the stepper carriage is broken. You can call Seagate Technology Incorporated for more information. Their technical support number is (408) 438-8222.

Unfortunately the solutions to your problem are not cheap. You can either buy a new hard drive to replace your ST-225, or you can send your hard drive out to a hard drive rebuild company or you can exchange your hard drive directly with Seagate. This last option will certainly be the cheapest and probably the best choice. Find the serial number of your broken drive and then call 1-800-468-3472. The technician at Seagate will provide you with an exchange number and the cost of the exchange. (ST-225 is \$85). You will receive a reconditioned ST-225 with a one year warranty (same as new warranty). This is certainly a lot safer then picking up a used hard drive at some swap meet with no warranty and for probably more money.

-- Roger Alexander --

**Q:** Would it be possible to plop an Ethernet card (8-bitter) into Burke&Burke's COCO-XT interface?  
-- Greg Beely --

**A:** You can put any card into the CoCo XT interface which:  
1) Does not require interrupts  
2) Does not require DMA  
3) Does not require a clock signal from the motherboard  
4) Is jumper selectable to PC I/O address range 320H-32FH (only)  
5) Does not occupy any PC memory addresses

I think an ethernet adapter would violate either #1 or #2, but you'd need to check specifications to be sure. You'd need to write the proper driver software for any card you install.

-- Chris Burke --

**Q:** What problems are involved in replacing the original crystal in my CoCo with a 32MHz crystal?  
-- Scott Pengelly --

*Continued on next page*



**Terry Laraway's CoCo Etcetera**

Parts  
Hardware

Hitachi 6309 chip & socket	\$12
Kel Am custom 'Y' Cables	(Call)
512K Ram Chips/Kits	(Call)

Phone (206) 692-5374  
41 N.W. Doncee Drive, Bremerton, WA 98310

## OS-9 Calendar

March 27-28  
**Middle America's Fest**  
Des Moines, Iowa  
See Special Update Article elsewhere in this issue

June 25 - 26  
**PNW CoCo Fest**  
Port Orchard, Washington

# Q&A

Continued

**A:** When installing a new crystal in the CoCo 3, here are the things you must compensate for:

- clock cycles per second
- the bitbanger port

The ACIA hardware isn't affected at all, since it runs off it's own 1.8MHz crystal. Probably the most important thing to do is patch your CLOCK module. I would suggest using an RTC anyway, since all software clocks on OS-9 Level II seem to drift over time, but without patching CLOCK, you'll notice a dramatic difference in the length of one second.

Before patching, we need to calculate the approximate value to put in the CLOCK's cycle byte. If we divide 28.63636 (the coco's currently rated crystal) by 60 (the number of ticks per second), we get .477272666. With this value, we can compute the number of ticks needed for the new value crystal.

$$\frac{28.63636}{60} = .477272666$$

Using a little algebra (oh, algebra!) we can deduct the unknown value thusly:

$$\frac{32.0}{.477272666} = x$$

Using this formula, we can compute the value needed to place in the Clock's cycle byte.

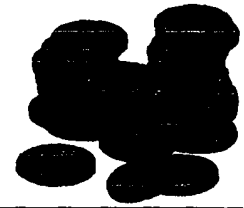
For Clock Edition #9 (Eddie Kuns), the patch location is \$7B. For a 32MHz crystal, a patch value of 67 is adequate.

Also, you will have to adjust your printer if it is hooked through the bitbanger port. Trial and error is best used, but the smaller the number, the better.

-- Boisy Pitre --

# CD-I

(Compact Disk Interactive)



With the successful launch of CD-I in the United States, Philips is receiving an increasing number of calls from people who are interested in developing CD-I titles. Our goal is to encourage anyone to exploit this exciting new medium and the following list is an attempt to answer basic questions as well as to direct those who are new to CD-I to the many sources of CD-I development hardware, software, and information.

**Q:** Where can I buy CD-I players and CD-I discs?

**A:** Consumers in the US who want information on where to buy CD-I discs and/or Philips CD-I players can call toll-free number for the Philips Consumer Electronics Hotline: 1 800 845 7301

**Q:** What tools do I need to produce CD-I titles?

**A:** You can make CD-I titles by using an authoring system or by writing custom programming. Authoring is a method for creating an interactive presentation using user-friendly, high-level tools. An authoring system enables the producer to make interactive presentations by integrating thousands of images, hours of sound, partial screen video clips and on-screen buttons and controls. An authoring system consists of a personal computer system (Macintosh or MS-DOS PC), a professional CD-I player, an emulator and software packages. Usually the video or audio assets are created or captured on the personal computer and then combined on the professional CD-I player. At the present time, one cannot use popular personal computing authoring packages (for example; Macromind Director, ToolBook) to create CD-I presentations; thus, one of the several specific CD-I authoring packages that exist should be used. For more complex presentations that require greater interactivity and faster execution, custom programming is necessary. Programming for CD-I can be done on a Macintosh, an MS-DOS PC or a Sun using a C-cross compiler and software libraries.

**Q:** What system do I need for CD-I programming?

**A:** The following is a guideline of some of the systems commonly used for CD-I programming in the C programming language. No specific recommendations or price information is given here, because this information is best provided by the suppliers of the development systems. Before making any decision about the systems to use, CONSULT YOUR CD-I DEVELOPMENT SYSTEM SUPPLIER FIRST.

**Hardware:**

High-end personal computer system or workstation  
Macintosh II or Quadra with at least 3 Nubus slots  
OR 486-based PC  
OR Sun Sparc

**Connections**

Ethernet cards + NFS software  
Serial cables

**MM/1**  
**Pacific Northwest Dealer**

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**GONZALES**  
**DATA SYSTEMS**

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SCSI cables

Professional CD-I player  
Philips CD-I 605  
OR ISG Cassiopee board for the Macintosh  
NTSC/RGB color monitor (a lower end one reflects end-user quality on TV in the living room much better)

Emulator  
Philips CD-I emulator  
OR ISG Cassiopee board for the Macintosh  
OR ISG emulator board for the Macintosh  
OR Script Systems emulator board for the PC type systems

Capture and encoding hardware  
high end audio capture board  
high end video capture board or scanner

**Software:**

Programming  
MPW on Macintosh, SunView on Sun  
OS-9 Cross Compiler for Sun, Mac or PC  
OS-9 source level debugger  
OR ISG X-Link  
Optionally:  
GNU Cross compiler on Sun or Mac

OptImage Balboa C Library  
OR ISG C++ Library  
OR Script Systems CD Vista C Library

Image & audio conversion  
Audio conversion utilities (ACUs)  
Image conversion utilities (ICUs)

Audio and image editing applications:  
Eg. for Macintosh: Adobe Photoshop, Studio 32, Macromind Director,  
DigiDesign SoundTools II

File transfer software to transfer files from Mac or PC to CD-I:  
from OptImage, ISG or Script Systems

Disc Building  
OptImage Master/Green  
OR ISG CDL and BD

**Q:** Where can I read more about CD-I?

**A:** Contact:  
Lex van Sonderen  
Manager Knowledge Transfer  
Phillips Interactive Media of America  
10050 Santa Monica Blvd.  
Los Angeles, CA 90025  
Internet: lex@animla.com

***Booster 2.0 vs NitroS9***

**Rebuttal by Wes Gale**

*"While NitroS9 attempts to patch every module by re-coding the stack frame offsets on interrupts, Chris' approach is much simpler and more portable"*

This approach may be more 'portable' and easier to implement, but it actually SLOWS down the machine to some degree. Sure, programs run a little faster in native mode.

BUT - for EVERY interrupt that happens, the interrupt handler has to waste CPU time to rearrange the sector stack to maintain system integrity. The overall effect may be slightly faster than when in emulation mode.

NitroS9 actually cuts down the number of CPU cycles needed to process interrupts. We will have to get a hold of this update to the Power Booster and make a direct comparison.

I'm more than confident that any of you will find NitroS9 to be faster than Power Booster 2.0.

If this method is preferred by anyone, NitroS9 could be modified slightly and operate in the same way as the Power Boost 2.0 does, but it would slow it down SIGNIFICANTLY.

As for portability, NitroS9 makes patches to every module known to need it except for *Home Publisher*, and we're working on that one right now.

== Wes Gale;FidoNET ==

\*\*\*\*\*

**Great Stuff**

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We've been in the software business for over 10 years--and we've developed lots of excellent software over that time. We don't have room in this space to tell you everthing, but we'd love to send you our catalogue listing all of our products. Great stuff like our *Ved* text editor, *Vprint* text formatter, *Cribbage*, *Magazine Index System*, *Ultra Label Maker*, *Vmail*, amd more.

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**Bob van der Poel Software**

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Phone (604)-866-5772

\*\*\*\*\*



# Club Activities Report

*Bellingham OS9 Users Group - Longview/Kelso CoCo Club  
Mt. Rainier CoCo Club - Port O'CoCo Club - Seattle 68xxx Mug*

## Seattle 68xxx Mug

We've moved!!!! Big surprise to all! We are now meeting in room 225 in Sieg Hall, located one building north of Guggenheim Hall, where we have always met in the past.

Our new room is much smaller and intimate. We had two new guest: **James Bannister** a UW student from Bothell, and **Charles Bradley** from Seattle.

The presentation by **Scott Honaker** was "Adobe Postscript Programming". Scott brought along a postscript printer and several sample listings. Postscript Language was originally developed for Apple's **Quick Draw**, **Image Writer** and **Postscript Printers**. Everything is in graphics, there is no rom based fonts, there is no text mode.

Postscript Language is actually very simple and similar to Logo. Example:

```

/BOX
  {144  0  RLINETO
   0    144 RLINETO
  -144  0  RLINETO
  CLOSEPATH } DEF

NEWPATH
  252  324  MOVED BOX
   0    SETGRAY  FILL

NEWPATH
  270  300  MOVED BOX
   .4    SETGRAY  FILL

NEWPATH
  288  396  MOVED BOX
   .8    SETGRAY  FILL
  
```

The above listing produced a printout similar to this:



Cool eh?

The second topic presented by Scott was technical information about the **21064A RISC CPU** that is in the new Digital Equipment Corporation's (DEC) new **Alpha**

**Computer.** Scott had several handouts and reviews on the chip's performance. He had actually seen several of these new machines running Windows NT at the Fall Comdex Conference in Phoenix.

## 21064A Risc (CPU) Chip

3.3 volts at 9 amps for 28 watts power consumption. The actual chip is about 1 square inch, yet the overall package is about 6 square inches to provide sufficient mounting surface to accomodate 431 pins. 291 signal pins and over 120 power pins. In the Alpha Computer, the chip operates at 300 MIPS (Million Bits/Seconc) and can process two instruction sets at the same time. Clock speed is 154MHz. on a 64 bit bus.

== Rodger Alexander ==



## Lonview/Kelso CoCo Club

*NOTE: My apologies to the Longview/Kelso group for failing to include their activity report in last month's Newsletter. Although this information is now a month old it is still relevant information since the Longview/Kelso Club is still meeting pretty much on a weekly basis. Contact any of the members listed in this report on **Columbia Hts. BBS** or **PNW FidoNET** echo for meeting times and locations.*

I bet you thought "we was dead" but we're still going strong (all three of us that is). I've included items from both our November and December meetings mainly because otherwise this would be an awful short article.

Sometime in November, **Allen Morgan**, **Mark Johnson** and myself (**Steve Hammond**), found ourselves huddled around Allen's computer after deciding the day before to meet. The meeting started on a surprising note when Allen started talking about the new computer he had ordered and whips out this brochure on the new Frank Hogg machine. the **KIX30**. Some of the interesting features of the **KIX30** are the cpu, which is a 68030 32 bit processor, the speed and ram. The speed of the machine ranges from 16Mhz to 32Mhz. Allen's machine will be 16Mhz but he plans to upgrade it which is easy to do. The ram ranges from 2 Megs to 128 Megs and the **KIX30** also comes with an 8k programmable RAM. Another point of interest is that the machine comes with a SCSI interface. I believe Allen plans to put the whole thing in a tower case and run it with a 240Meg Quantum hard drive.

I must admit that one thing that caught my attention was

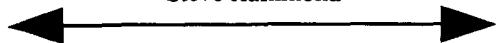
the price. I thought a 1000 + for a bare mother board and some software was pretty steep but Allen assured us that if you compared prices in the Computer Shopper for what you got in the KIX30, it was a pretty good deal. Another consideration is that it will be a long time before this computer is obsolete.

The next part of the meeting was taken up with miscellaneous stuff like running *scalz*, a calculator program and firing up the modem and trying some things on it. One item that was interesting was a demonstration by Mark Johnson. First Mark called his bulletin board and called up an OS-9 shell through the utilities section. Then he accessed a level I terminal program (important because it doesn't use ALT commands) and called another bulletin board from his bulletin board.

Our December meeting was at Allen Morgan's again. Allen showed us his 8 Megs worth of Simm chips that he had bought for the KIX30. He thinks that the mother board may arrive before Christmas but doesn't know. Allen did mention that he bought the fastest Simms he could find so they won't slow down his machine when he speeds it up. Needless to say we are all anxious to "help" him with his new computer.

We spent a lot of the meeting trying to figure why Mark Johnson's machine would not boot up. After tearing it apart, cleaning contacts and putting it back together, we got it to go again. Mark has his CoCo in a PC case along with his 80 Meg SCSI hard drive and a 3.5 inch floppy. Looking under the hood of his machine kinda reminded me of our club, we're not very organized but we keep it running .

== Steve Hammond ==



### Port O-CoCo

If the equipment won't come to the meeting then the meeting needs to come to the equipment. That was the final solution to the Port O' CoCo plight of trying to show members the magic of BBSing. But we are getting a head of our story.

As the group gathered we started the meeting at the announced time of 7 p.m. First there was the matter of the upcoming computer swap meet by a new group in Tacoma. The DeMolay of Tacoma wanted to offer an event in its home town. So they made one of their own. One of the first policy decision was to make space available to groups at no cost. The Computer Bank Charity took advantage of the offer because any new exposure is great for the cause. The CoCo community took advantage of it because we had lost the other way to meet new people. Although the attendance was light neither group can really complain. The CBC earned over \$400 for the cause. The CoCo community found a new, excited member in **Warren Pietras** of Gig Harbor. Also, we found a great retailer who was selling 2400 baud modems for only \$35. **Terry Laraway** bought ten of them. He may have one or two of them left if you are interested in getting one. (See his ad elsewhere.) So it was a fine event, although a relatively quiet event.

The next topic of the meeting was the question of a need for a business license. This question was brought up by the Tacoma PC group when they had a "friendly" communication from the Department of Revenue of the State of Washington. They wound up having to get a license and pay back state sales tax for a couple years. Our **Bud Helck** called the Department to get the details as they apply to us. The PC group actively sold stuff at each meeting. Thus, they needed a license and pay taxes. We have one event a year at which we sell mugs, T-shirts, etc. (The equipment sold at meetings is either personal equipment or from the CBC, which has its own state license.) Since it's a once a year thing we can fill out a one-sheet form after that event and avoid having a state tax license. Now, all of this leads to the bigger question of the IRS. And Bud is exploring that question. If we think that we are too small for the IRS to worry about, we are wrong. The IRS is now actively looking into all non profits to find cases of noncompliance. We might as well face this question now and get it out of the way.

The PNW CoCoFest III is now on the Port Orchard Chamber of Commerce annual calendar. That means that the dates and a brief description of the event will be handed out, mailed and circulated all over the Northwest and beyond. Some 50,000 copies of the annual calendar of Port Orchard events are circulated each year. Secondly, the event has requested to be part of the Fathom O' Fun event. This is a 25 year old festival that goes on in Port Orchard each year. They are including us in all their publicity and we will include them in ours. Both of these PR moves involve no relinquishment of control and doesn't cost us a penny.

Continuing with the good news, a couple of the members found a GREAT deal on hard drives at the last computer swap meet in Silverdale. An 85 meg drive for \$92. (Contact Northwest Computer Outlet (206) 876-2757 if you want to get one for yourself! They may be able to get more.) So the club has a hard drive now. At this meeting we approved the purchase of a controller and interface (Burke & Burke) with an internal clock and the software to partition the drive so we can have all our RS-DOS as well as our OS-9 software on the one drive. We also purchased one of the 2400 modems mentioned above. So we will soon have one tough system in a tower with a heavy handle to go anywhere! Will it be March??? Or will it be April?? Show up at both meetings and see for yourself.

At this point we moved to a nearby home to call **Cloud's Corner**. We hooked up on the first try. The interest in "modeming" or BBSs was high and about half of those attending the meeting signed up on **Larry Cloud's** board as their first step into computer communications. Larry was kind enough to jump in and out of chat mode to answer questions and to guide people through any of the steps that seemed confusing. Those not on the computer were clustered in 2s and 3s for enthusiastic conversation.

Our next meeting is March 15th, 7 p.m. at the usual place. Other than our ongoing projects the major topic has yet to be decided.

== Donald Zimmerman ==

## Washington State BBS List

### **COLUMBIA HTS. BBS**

-- Lonview/Kelso --  
RiBBS (FidoNET)  
(206) 425-5804

### **DATA WAREHOUSE BBS**

-- Spokane --  
RiBBS (FidoNET)  
(509) 325-6787

### **BARBEQUED RIBBS**

-- Bellingham --  
PC-Board (PC-Net) - CoCo Conference #5  
(206) 676-5787

### **OS-9 TACOMA BBS**

-- Tacoma --  
RiBBS (FidoNET)  
(206) 566-8857

### **ULTIMATE EXPERIENCE BBS**

-- Anacortes --  
RiBBS (MaxNET)  
(206) 299-0491

## *Bellingham OS-9 Users Group*

### **OS-9 and the Color Computer \$5**

*Tutorial and Hardware Hacker's Manual.*  
Includes 5-1/4 Disk of (360K) of upgrade software

### **Color Computer Video Library \$10**

Fixing the MultiPak IRQ \* Installing Floppy Drives  
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