Bellingham OS-9 Users Group

Gimix, CoCo, Atari, Mac
6809 - 68K OS-9 Level 1, 2, 3

Volume I No. 7 July 31,1990

OS-9 MEETINGS:

Meetings are held at 7:30 p.m., the second Thursday of each month in room 109 at Sehome High School

BENEFITS TO MEMBERS:

As a participating member of our new Bellingham OS9 Users Group you enjoy many benefits:

1. Newsletter
2. OS9 Bulletins
3. Public Domain Library
4. Technical help
5. Lectures and demonstrations
6. Periodic group purchases
7. Membership List
8. Access to GIMIX Level-III OS9

HELP WANTED!

Our group needs editorial volunteers. If you can contribute with information or helpful experiences of your own, please contact Rodger Alexander. The health of our newsletter depends on contributions made by many members of our group.

IN THIS ISSUE:

SUBSCRIPTION INFORMATION:

Newsletters are available free to those in attendance at the monthly meetings. If you would like to receive the newsletter in advance by mail, a subscription rate of rate of $3 for 6 monthly issues or $6 for 12 monthly issues is available.

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BENCHMARKS
by Kevin Darling

Just for fun, I've run a speed comparison test... what I did was to GET an 80x40 block of gfx, and then PUT it across the screen in a matrix (the actual count of PUTs is close to 1400). All programs were in Basic.

The results were:

15Mhz 68070 (MM/1) at 640x208x16-color - 6 seconds
(prelim ver)
2Mhz 6809 (Coco3) at 640x192x 4-color - 490 seconds
(old grfdrv)
2Mhz 6809 (Coco3) at 640x192x 4-color - 34 seconds
(L-II grfdrv)
2Mhz 6809 (128K) at 640x192x 4-color - 55 seconds
(RSDOS Basic)

Previous tests drawing lines and circles had also shown the same ratio between the 68K and L-II fast grfdrv... about 5:1.

Now note that the MM/1 was moving twice as much data, because it was in 16-color mode vs 4-color on the CoCo. So I reran the fast grfdrv L-II test using 16-color mode (same number of PUTs) to be more fair...

2Mhz 6809 (Coco3) at 320x192x16-color - 54 seconds
(fast grfdrv)

Now the 68070 shows up as almost 10 times as fast. Starting both tests at the same time really shows this speed diff up... the MM/1 goes splat! splat! splat! onto the screen and finishes, while the coco continues for what seems like an eternity. And I had been so proud of my fast grfdrv Puts (wry grin).

I would like to see some comparison data running the same ..benchmark.. program on other computers....Any volunteers. My program was in Basic, no fair cheating with C or asm (grin). The program looked like this (hardly a scientific test, mind ya):

```
PROCEDURE btest
DIM x,y:INTEGER
GET an area of 80x40 pixels into buffer
FOR y=0 TO 100 STEP 10
 FOR x=0 TO 500 STEP 4
 PUT the buffer at (x,y)
 NEXT x
NEXT y
END
```

The 68070 at 15Mhz is approx equivalent to a 12.5Mhz 68000. Or supposedly. Here are some interesting results posted on CIS of various computers running the Basic09 benchmark from the Rainbow Guide:

CPU	1000 ints	10000 ints	20000 ints	1000 real	Computer	Ba
2Mhz 6809 -	4	40	78	10	CoCo	
12Mhz 68010 -	3	26	52	8	VMEbus ?	1.2
15Mhz 68070 -	2	20	39	13	MM/1 (3meg)	2
16Mhz 68000 -	1	12	23	8	PT68K	2
25Mhz 68030 -	1	8	14	2	VMEbus ?	2.8

Note how well the CoCo does on REALs, although of course you must remember that 68K Basic is written in C (!), and also has much larger REAL/INTs than 6809 basic09 does. This was a good Basic comparison, but many more such tests are needed to point out asm/c/pascal/etc diffs. The base TC70 should show the same results as the base MM/1.

Q & A's
Featuring MM/1's Paul Ward

EDITOR.S NOTE: *On July 25th, Compuserve (CIS) hosted a Q & A session with Paul Ward from IMS, manufacturer.s of the new MM/1 computer.*

Some of the people who were logged on to participate in the conference included:

John Wainwright	Kevin Darling	John Dickey
Jerry Stratton	Mike Haaland	Stev Hamilton
Frank Hogg	James Jones	Pete Lyall
Dan Robins	Phil Scherer	Mark Siegel
Jerry Stratton	Zack Sessions	John Baer
Paul Ward	Carl Waters	Steve Wegert
Bob Wilkinson	Brett Wynkoop	Ed Grewick

QUESTION from PHIL SCHERER: If I see ..xyz.. DOS program advertised, how can I tell if it.ll run??

ANSWER: Good question! I can.t tell all right now, but the way our DOS stuff works is that CERTAIN applicationss will run -- you.ll see them in our catalog. They will at least include most of the Borland productivity thingies, like Sprint, Multimate, Quattro. We.re looking into WordPerfect, dBase 3, and others, but no announcements there.

QUESTION from JERRY STRATTON: You mention a 32 bit bus in the latest Rainbow. What is it? AND When will it be available?

ANSWER: Well, Jerry, we have a bus spec that most people would describe as a passive VME system. However, considering the also-ran nature of ANY bus that ain.t EISA, ISA, MCA, or NuBus (Apple.s or otherwise), we would be foolish to force our users to choose our bus with no options. So we.ll be offering some VERY INTERESTING options. Can.t announce THAT... As to when it will be available, we.re looking at making it available in the first quarter 1991.

QUESTION from John Dickey: Two things... First, Desktop publishing.. any software ala pagemaker? And Second is...

I do a lot of applica-tions development using the Sculptor [database program]... will it be ported over?

ANSWER: Good question. Desk Top Publishing is EXPENSIVE to develop. We have a guy in our developer.s group who has committed to one, but it will be a while before a good DTP will be there ... HOWEVER .. we are big on laser support and recently got HP scalable fonts, all of which will be available and USEFUL on the MM/1 for laser and other printers.

As to your second question: I don.t see that Sculptor won.t be able to run on it out of the box... but be sure that you are not violating the software license agreement by ... using one package on two CPUs, as that is illegal.

One comment... We are working on DOS database technology that will give us at IMS the ability to port of dozens of DOS apps in our sleep, so you may wish to keep developing in Sculptor until we announce our database environment it.ll benefit the users and the developers.

QUESTION from PETE LYALL: Has a MIDI design been finalized, and is it ..intelligent.. (i.e. built in timers, buffers, etc.)?

ANSWER: We have several things cooking on the MIDI side. Can.t reveal ... but!! Just these last few days we have gotten some INCREDIBLE leads. Keep tuned. On the hardware side, the stock machine (barring anything new) will use a timer laid aside for that purpose... and the serial port should easily handle the input/output.

QUESTION from PHIL SCHERER: Any CAD??--The lack of cad in OS9 is a liability to..Whole company system installations...

ANSWER: Actually, I assigned one person the job of talking to a leading CAD vendor about porting to OSK, and things are moving a little slow. I guess we should really do a little market research and find out what the process priority should be. Naturally, OSKers in general would like it, but how many can we sell, and at what price to offsEt the license fee?

QUESTION from JOHN BAER: two questions... 1) what IS the target date for release of the MM/1... and 2) what about CDI?

ANSWER: Excellent. Ok, target date IS January 1, 1965, which is when we REALLY needed the MM/1. But, FCC takes its own sweet time and Mid September [1990] is the wisest announcement I can make. FCC is VERY important to us.

As to CD-I, if I understand what you.re driving at, we are talking to two CD-I companies about moving some of their tools and products over, the only challenge being that we are NOT a CD-I player with a keyboard, so some things will have to change. However, we have the horsepower to do this much more than the Amiga does with their CD-TV thingie. So you should see a few things coming out from us. It.s not going to be an onslaught at first, though.

QUESTION from DAN ROBINS: OK, you.ve given a lot of ..can.t says.. and ..in the process.. statements about software and hardware add-ons. Is there ANY software or hardware items you can release information on... regarding availability when the computer is released?

ANSWER: Good question. .... The add-on serial board that we have designed for the first board ... you know, the one that goes on a header and can be changed to a MIDI port ... will be available right away, and we have added two headers to the second board that use the same serial port boards, making the MM/1 potentially a five serial port machine. Several of these use hardware handshaking, which is KEY to some software ideas we have, vis a vis uucp and others.

[Note: these ..serial boards.. referred to are the level-converters and MIDI or 9/25-pin RS232 connectors. They plug into headers on the boards, where the actual serial port chips are located.]

ALSO we should have available real soon after the MM/1, a BBS, telecom, word processor, and other things. You.ll have to, I.m afraid, wait for specific details. Don.t want to announce until we are SURE we can give it right to you! For sure, Microsoft.s Quick Basic will be available at the time of the MM/1.s release date.

QUESTION from JOHN WAINWRIGHT: Ok here we go... I have seen refs to a ..3 meg MM1..... does that second board come with 2 megs on it? Also, how about the CoCo-3 connections (OS9 Gateway)?

ANSWER: To answer your first question: You can get it either way -- if you get it WITH, we.ll provide the SIMMS at a great price. If you get it WITHOUT memory but order it WITH the first board, you get $50 off -- of course, you.ll get the $50 off if you order the board with SIMM memory when you order it with the first board, too.

Regarding the OS9 Gateway: It.s basically a high speed parallel port. The precise way we are going to implement the software is not ready for announcement. However, to be honest, this Gateway idea is funda-mentally mine... and tragically has not been a big issue to most of our user, leaving my ego bruised. However you should see something on it in 1991. Not right away. Too much other Cool Stuff to do for now.

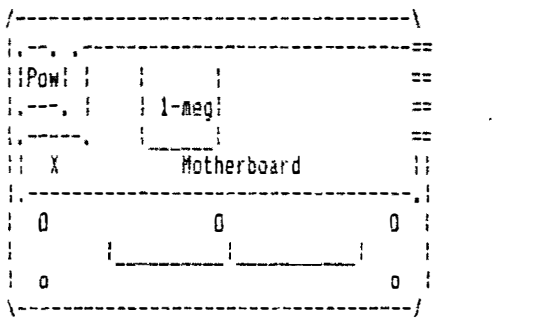
OS-9

A BIG FAN for your CoCo

by Tim Koonce

First of all, the particular fan I bought was the 3" 12V DC fan sold by Tandy. I forget the model # (I have it somewhere at home), but there should only be one fan that fits that description. They also sell a smaller fan, but I used the 3-inch square one. It.s 1" high, and JUST fits under the keyboard.

Assuming you have this fan, open up your CoCo and remove the keyboard. Below is a roughly-schematic drawing of the CoCo-3 from memory.



Pow = Power Supply 1-meg = 1-Meg Ram board
.O. = Refers to the Keyboard supports
¦___¦___¦ = Ribs which are beneath the kayboard.

The first thing you.ll want to do is clear a space for the fan. I put mine to the right of center under the keyboard. Of course, to do this, I had to remove some part of the ribs which are under the keyboard. Decide where you want the fan to go, and remove ribs appropriately! (Remember that you want ventilation holes where the fan goes! Also, you.ll want the fan as close to the motherboard as is possible.) Block all ventilation holes which will not be under the fan. I blocked mine with cardboard cut to the right size and taped down with masking tape. You.ll want to drill (or .solder.) holes for bolts to hold the fan in place. I only used two bolts (all I had available) but you could go all-out and use four!

About where the .X. is, look for a LARGE stand-up capacitor. There should be a smaller one right next to it. We.re not talking wimpy ceramic caps, (wink) we.re talking big, metal-jacketed electrolytic caps! You may wish to verify that you get about 12V across the smaller cap, which is the one you.ll be connecting to.

OK, so remove the motherboard from your CoCo. (You.ll need to unplug the power supply from a jack right next to it on the motherboard.) Remove the foil underneath the motherboard around the capacitor. Solder the connec-tions for the fan across this smaller stand-up electrolyte capacitor. Reat-tach the ground-plane, (The foil underneath the mother-board.) routing the wires appropriately. Before you put the motherboard back, cover all vent holes underneath the where it will sit.

Put the motherboard back; replug the power supply to the motherboard. Now, you.re ready to bolt down the fan. Route the fan.s wires appropriately. Turn on your CoCo ... the fan should whir to a start!

Now, cover all vent holes in the top 1/2 of the CoCo case except those above the power supply and 1-meg board. (I covered these also with cardboard and masking tape on the inside of the case. White cardboard so it doesn.t look ..goofy...) Replace the keyboard, put the top 1/2 of the case back on, and you.re in business!

I hope these instructions are simple + straightforward enough. If you have any questions (or corrections!), ask! That.s how I put my fan in, and it.s been working flawlessly for a couple months now. It really makes a diff-erence, tho I found I had to have the case screwed tightly shut to keep the air flowing where I want it to. Good luck!

EDITOR'S NOTE: Radio Shack sells a 12VDC fan, Cat.# 273-244 that fits exactly between the ribs directly above the 512k ram board. I used a small piece of double sided tape to secure the fan to the top. Works great!

The OSK'er Magazine

Review by Rodger Alexander

I just received my ..Premiere Issue.. of the OSK.er, ..News and Views in the World of OS9/68000 and 6809... The magazine will be published monthly by St6 Computers Inc. Since this is the first issue, most of the articles are written by the editor, Scott Griepentrog.

What I liked most about the magazine was the format, 24 pages organized like an OS9 data disk. The table of contents read like a ..Dir e.. listing:

Directory of /dd/OSKer/Jul90 10:02:46

Owner	Last modified	Attr	Sector	Bytecount	Name
Editor	90/07/09 0935	r-wr	3	11550	Tale_Of_2_
OSKer	90/07/09 0756	r-wr	5	9204	Doc_OSKer
Bug	90/07/09 0446	r-wr	7	22826	Do_Windows
Editor	90/07/09 0757	r-wr	9	3127	Ed_Ramblings
Editor	90/07/09 0757	r-wr	10	5844	Flame_ON

The beginning of each article had a ..file header... again just like disk file descriptor/header:

FILE DESCRIPTOR: A_Tale_Of_2_Computers
OWNER: Scott Griepentrog
ATTRIBUTES: Editor, OS9 Freak
ALLOCATION MAP: Sysop@Root (St6-Net), 72427,335@CIS, St6@hummer.iupui.edu

Now you may not like a disk file type format used in print,

but I thought it was quite clever and I especially liked the E-Mail address included in the file descriptor.

Another welcomed feature was the low, **low**, advertizing rates that should invite a flood of advertizers. At $20 for an 1/8th page add ($100 for full page), even Bulletin Boards (BBS) will be able to advertise (even OS9 clubs).

The regular feature articles were well explained by the editor and look to be very exciting when next month.s issue comes out. An article on windowing, including a Public Domain program ..POP.., was excellent.

YES, there is a Question and Answer section and in this first issue (since no one has had an opportunity to send in questions) The Editor supplied his own questions. Easier to answer your own questions, Right?! And, since there was a long featured interview with Kevin Darling about the MM/1 in this premier issue, the questions and answers dealt with questions about the MM/1 and TC9. I learned a great deal and discovered that the TC70 is the Frank Hogg equivalent to the MM/1 and there is not really any comparisson between the MM/1 and the TC9. It would be more fare to compare the TC9 with the CoCo-3.

Subscription rate for the OSKer (pronounced ..Oscar..) is $12 per year in the U.S., $15 in Canada, and $20 overseas. All program submissions must be Public Domain and a 6 months free subscription is the fee paid to those whose articles are accepted.

At $1 per issue, Scott Griepentrog is not going to make any profit on this venture, in fact I.ll bet he.s going to loose his shirt unless a lot of advertisers sign up. At $1 per issue, this is a steal. Too good of a bargain to let it pass by. Subscribe!
Send in your $12! To:
The OSKer, P.O. Box 24285, Speedway IN. 46224

PC Keyboard on a CoCo

Some theory and data
by Tim Koonce and Mike Knutsen

An XT keyboard should be relatively easy (and inexpensive) to hook up to almost anything (I think).

Two approaches are possible:
1 - Designing hardware to mimic the matrix-encoded CoCo keyboard. This is what the commercial ones do. They use a dedicated controller chip, and some not-completely-trivial programming of that controller to accomplish this.

2 - Hooking it up straight. Since the CoCo uses 15 programmable I/O lines for the standard keyboard, it should be easy to hook a UART up to 8 of them to allow direct reading of the XT keyboard. The catch then is software. OS9 is easiest: you ..only.. have to rewrite the part of CC3IO which reads the keyboard, and hack RSDOS to auto-boot OS9 (otherwise you wouldn.t be able to type ..dos.. (grin)). For RSDOS, you would have to patch the ECB ROM, and almost every machine-language RSDOS program you own, since very few use the ROM keyboard routines.
-Tim

As Tim pointed out, there are some problems with ..just hookingup.. an XT keyboard to your coco. XT keyboards (but NOT AT ones...) can be hooked up with only two chips- a 74HC595 and 74LS74. Check the GFX board described in the Oct or Nov .87?? issues of Byte magazine (Steve Ciarcia.s column) for the schematic. AT keyboards won.t work because they are bi-directional, and the .595 only recieves. $89.50 ain.t too bad when you think of the work and research that was involved. Bob did a great job with his interface.
-Mike

HOMEWORK

by Rodger Alexander

REVIEW: In our previous article we used the OS9 Level-II CONFIG utility to build a new system disk and then we modified the drive descriptors for faster stepping rate and the TERM so that the CoCo would boot up on an 80 column screen instead of that ..yukky.. 40 column green screen. I gave examples of using MODPATCH, DMODE and DEBUG to make our customized modifi-cations. And finally we used the COBBLER utility to copy our modified OS9Boot file from memory to a freshly formated disk.

At the time I tried to stress the difference between two similar OS9 utilities, COBBLER and OS9GEN. While COBBLER copies the OS9Boot file from memory to a blank disk, OS9GEN copies files from your system disk to a blank disk. This month we will use OS9GEN to further customize our OS9Boot file in order to speed up our CoCo.

One major feature of OS9 Level-II compared to Level-I is that when a file is loaded into memory, that file is loaded into an 8K memory block. Even if the file is only 32 bits long, such as a window descriptor or disk drive descriptor, OS9 Level-II assigns 8,000 bits of memory to that one file. **What a waste!** In that regard, Level-I was much more efficient in that a file received only as much memory as it required. Even Level-II in other OS9 Computers, such as the GIMIX, provide each file with only as much memory as each file requires.

After booting up your Level-II system, if you were to start loading in a bunch of heavily used utilities into memory to speed things up (so the CoCo wouldn.t have to go to the disk all the time), you would soon run out of memory. Even with

a 512K upgrade you will have the same problem because the memory module directory or system memory is only 64K. If your OS9Boot file were 24K you could only load in 5 more files into memory before running out of system memory. What a bummer!

IDENT:
When you type in MDIR you will get a display of your memory directory. There.s alot of files in there, almost as many files as there are in your commands directory. How could so many 8K files fit into that 64K memory? The answer is....the OS9Boot file cheated. All those files were merged together.

ENTER: IDENT -s /d0/os9boot

What you will see is a listing of all the individual files that were merged together to make-up the OS9Boot file. OS9 will gladly give OS9Boot 8K and if the OS9Boot file is larger than 8K, then OS9 will give it 16K. If the OS9Boot file is 17.5K then OS9 will give it 24K (remember the 8K blocks?).

MERGE:
Obviously, merging files together to create one large file is a pretty nifty way to get around the 8K memory block problem. So if we merged several of our most used utilities into one file, we can also get around the 8K memory blocking problem.

1. Enter: chd /d0/cmds
2. Enter: merge dir copy ident list del >util1
3. Enter: attr util1 e
4. Enter: load util
5. Enter: mdir

Wasn.t that easy. First we changed our default directory to the CMDS directory, then we MERGEd 5 utility files into a file we named UTIL1. Then we had to ATTRibute the new file as executable, since this is a binary file, and then finally we LOADed the file into memory. When you view the memory directory with the MDIR command you will see each of the individual files listed. Best of all, the five files combined consumed only 8K of system memory. Just for practice, let.s do another one:

1. Enter: merge wcreate xmode free mfree mdir >util2
2. Enter: attr util2 e

Now you can create your own merged file with different executable modules/files. A good practice is to make your merged files NO LARGER THAN 8K LONG! Otherwise, if the system only has 8K free in the systems memory directory and you try to load in a 16K block merged file full of memory modules..... BAM! (error 206 [module directory full])

When you have created merged memory module files specifically for your system you can LOAD them into memory automatically by including the load command in you STARTUP file. When OS9 boots up it will always search for a script file called STARTUP. If you include a ..LOAD util1.. command in your STARTUP file, your merged utilities will load up into memory as part of the boot-up process.

TEARING APART OS9BOOT:
I.ve noticed on some OS9 systems that several of the required files in the CMDS directory have been included in their OS9Boot file. OS9 will not boot if it cannot find SHELL and GRFDRV in the CMDS directory. However, OS9 always looks into it.s memory first before looking into the CMDS directory so it makes sense that some people have included SHELL and GRFDRV into their OS9Boot file. How did they do it? Well it.s not so easy, but here goes.

There are at least three utilities that I am aware of that are used to separate merged files such as the OS9Boot file. They are:

1. BOOTSPLIT
   (Pub.Domain) Separates merged files
2. SEPARATE
   (Pub.Domain) Separates merged files
3. MODBUSTER
   (D.P.Johnson)Separates merged files

The idea is to create a new directory and then separate all of the merged files in the OS9Boot file into this new directory, then delete, substitute or add files to the directory and then use the directory of files as a source for OS9GEN to create a new OS9Boot file on a new disk. For practical purpose, lets add SHELL and GRFDRV to our OS9Boot file as outlined above.

STEP 1: Creating a new directory to put our boot modules/ files in.
ENTER: makdir /d0/TEMPBOOT
(creating directory to store boot files)

STEP 2: Separating the OS9Boot file into individual modules/files.
ENTER: chd /d0/tempboot
(making our new directory the default)
ENTER: bootsplit /d0/os9boot
(separating the merged files)

STEP 3: Copy ..shell.. and ..grfdrv.. from the CMDS dir. to TEMPBOOT dir.
ENTER: copy /d0/cmds/shell shell
ENTER: copy /d0/cmds/grfdrv grfdrv

NOTICE: I didn.t use the full path name for the target directory since I had already CHD (CHanged Directory) in step 2 to make TEMPBOOT the default directory. Although there is nothing wrong with using the full patch name:
copy /d0/cmds/shell /d0/tempboot/shell
copy /d0/cmds/grfdrv /d0/tempboot/grfdrv

STEP 4: OS9GEN a new boot on a freshly formated disk
ENTER: os9gen /d1 </d0/tempboot

STEP 5: Copy directory and files from your system disk
ENTER chd /d0 (reset directory)
ENTER: dsave /d0 /d1 !shell
(we did this last month)

SUMMARY:
Now place your NEW system disk in drive 0 and reboot your CoCo. If you included in your startup file a ..load util1.. instruction as suggested above you should see your merged utility modules when you enter MDIR. Also you should see SHELL and GRFDRV which you merged into your OS9Boot. So basically all we have really done in this HOMEWORK session is merge files. One way was by simply using the MERGE command to combine several executable files into one large file (don.t forget to set the executable attribute), the other way was to add files to a directory of files and then use OS9GEN to merge them into an OS9Boot file on a freshly formated disk. We also used a boot spliting utility to un-merge the OS9Boot file so that we could get at the individual files.

In practical usage I needed to replace the original SHELL with an upgraded version known as SHELL+, also I needed to replace the CLOCK module with another version that responded to my real-time clock rom-pak by Speech Systems. I.ve also added hard drive descriptors and drivers, replaced my CC3Disk with an updated version, etc., etc., and the list goes on and on, so learning how to split the OS9Boot and OS9Gen a new boot becomes a necessity. The utility EZGEN by Burke and Burke makes the whole process much, much easier since it writes the new OS9Boot file to your system disk replacing the old OS9Boot. As you get more into ..customizing.. your system, EZGEN is a utility that you will need to purchase.