Commodore SuperPET MMU OS/9 Software Notes
Compiled by Andy Grady (OCT 2021)

System Disk

Links to General User Guides that will be useful

http://www.roug.org/soren/6809/os9guide.pdf
http://www.roug.org/soren/6809/

The System floppy contains basic 4.0 programmes and a rel file which effectively is the OS9 disk.

- Format.os9 – creates REL files on a floppy which itself can be formatted as new.
    - OS9 REL A is the main disk which is accessed as /d0 (39 track)
    - OS9 REL B is the next disk which can be accessed as /d2 (44 track)
    - OS9 REL C is the final disk which can be accessed as /d3 (35 track)

- The format.os9 program found on the SuperPET Dynacalc floppy has been modified and automatically creates all three 'rel' drives. You can also use this program to create a single os9 rel file drive (such as adding an os9 drive B rel file to an existing os9 disk) by quitting the program after its creation.

- The format.os9 programs on the other floppies ask for number of sectors rather than tracks. In which case use 624 for the main disk (A) and 640 for other disks (B & C) (for 4040 and 8050 drives)

- Note: 8250 drives have an extended REL file capability which is not compatible with the 8050. To use 8050 REL files on the 8250 you have to disable the extended REL file capability. This is covered in the 8250 user manual.

Now that the disk's surface is ready for use, boot into OS/9, insert it in drive 1 and type the following commands:

```
OS9: dir /d1
ERROR #241
```

This will initialize the system pointers (you must do it only once before you access a drive for the first time).

```
OS9: format /d1
```

This will build an OS-9 file system inside the RELATIVE file.

One important thing to remember is that the number of blocks (sectors), which are allocated by 'FORMAT.OS/9' and the OS-9 'FORMAT' utility should be equal to the number of tracks requested x 16. The following values are recommended:

CBM Drive Model	Sectors	Tracks(cylinders)	Capacity
2031,4040,8050	640	40	160 K
2031,4040,8050	624	39 (system disk)	156 K
8250	4000	250	1000K

NOTE: I have extended the tracks to 44 successfully for REL A and B

If the above procedure seems too lengthy, there are at least two ways in which you may speed up the process. The first is to follow the above procedure only once, then use the CBM DOS 'Duplicate' command to create additional file systems. The second alternative is to wait until we produce second generation direct access disk driver software that will eliminate most of the difficulties.

You may have wondered why an 8050 file may hold only 160-178K of data in OS-9. You also must have noticed that all OS-9's RELATIVE files are named 'OS9 DRIVE A'

"Most CBM 8050 drives cannot handle RELATIVE files larger than 178K. A solution is for the user to build TWO logical file system on EACH 8050 DRIVE, thus extending the storage capacity of an 8050 single drive to approximately 350K. On the 'Super-OS/9 B09+MOD' disk, you will find two files, 'd8d8' and 'd8d9'. These files represent two different configurations of the 'os9' LOAD/BOOT module, which is found on your SYSTEM disk (default is os9 = d8d8). 'd8d9' let's you access FOUR logical drives, resident on TWO CBM dual drives, addressed as units 8 and 9. 'd8d8' will allow access to FOUR logical drives resident on ONE CBM dual drive system, addressed as unit 8. The first RELATIVE file system on each drive is referred to as 'OS9 DRIVE A'. The second file system on each drive is known as 'OS9 DRIVE B'. In the release version, we have copied 'd8d8' into 'os9', therefore it will support TWO logical drives on EACH physical disk:

disk8/0.os9 =	d8d8		d8d9
OS-9 name|	Waterloo OS name		Waterloo OS name
/D0	|(f:129)disk8/0.OS9 DRIVE A,rel		(f:129)disk8/0.OS9 DRIVE A,rel
/D1	|(f:129)disk8/1.OS9 DRIVE A,rel		(f:129)disk8/1.OS9 DRIVE A,rel
/D2	|(f:129)disk8/0.OS9 DRIVE B,rel		(f:129)disk9/0.OS9 DRIVE A,rel
/D3	|(f:129)disk8/1.OS9 DRIVE B,rel		(f:129)disk9/1.OS9 DRIVE A,rel

OS9: BACKUP

This command is similar to the CBM DOS command 'C1=0' or 'C0=1'. The main similarity is the fact that in both systems the floppy disks must be identically formatted before the copy command may proceed. In OS-9, you MUST create a dummy file system (using the FORMAT utility) with attributes that exactly match those of the floppy which you wish to backup (i.e. same number of cylinders, density and sides). Then and only then will the command succeed."

To boot into OS9, go into SuperPET mode and type

Disk8/0.os9

Enter the date and time when prompted and you will eventually be put into the OS9 environment.

I have modified the system disk from Mikes Webpage as the keyboard was not mapped well in that version for some reason.

os9-systemd0d2d1d3.d80 –

- Has one REL image: - os9 drive A

- If you add another OS9 drive on the system disk, which will be B, then it will be accessed as /d2

- Inserting a floppy into Drive 1 then OS9 DRIVE A and OS9 DRIVE B on that disk are accessed /d1 and /d3

FYI: - Dynacalc has two os9 'rel' disks in the image.

os9-systemd023d1.d80 –

- os9 drive a, b and c on disk 0 can be accessed through /d0, /d2 and /d3

- Inserting a floppy into Drive 1 – OS9 drive A accessed through /d1

- On /d2 you will find a number of utility programs. One of them is Mount which enables you to change which 'rel' disk is mounted. You can also mount disks on a different physical IEEE devices (such as device 9 etc)

  The format is: mount os9drivenumber,cbmdevicenumber,disknumber:rel image letter

  e.g. mount 3,8,0:C will mount /d3 as OS9 drive C in the 8050 drive 0. the drive number is 8

Other programs on /d2

- **Disasm** - a disassembler
- **Tree** – a module listing all the files in a superpet relative file
- **Grep** – a text search program
- **Kalah** – a games based on an ancient Bedouin Arab game
- **Xlisp** – a variation and subset of the Lisp language, used in AI apps
- **Print.c** – an output formatter for c programs
- **Showc** - a utility to make unprintable character's in a text file visible
- **Delw** – delete a list of files using wild cards
- **Replace** – replaces strings in a text file
- **Strip** – used to strip, add or process any combination of: CR LFs or other control character's
- **Time** – displays current time in a formatted manner
- **Dasm** – another disassembler

- **Cbmlst** – no idea what this does
- **Example** – again think prints results from a complex formula but no idea why
- **RunB** – module to run Basic09 programs

It's easy to copy out files from the os9 environment and also to copy them back into the 'rel' file.

In /d0/cmds you will find 2 modules

- **cbmwrite** [@][<drive#>:]<filename>[,<CBM DOS options>]

  <CBM DOS options> may be any combination of the following items, separated   by commas <,>.

  > <W[RITE]>
  > <S[EQ]>
  > <P[RG]>

  Square brackets [] represent optional parameters

  Angled brackets <> represent an instruction to the user to replace its contents with appropriate information.

  e.g   cbmwrite @n:filename,P,W < /dx/filename

  takes the program filename and copies it to drive n. The P can be changed to S for Seq files. x is the os9 drive number such as /d0 or /d1 etc.

- **cbmread** [<drive#>:]<filename>[,<CBM DOS options>]

  <CBM DOS options> may be any combination of the following items, separated by commas <,>.

  > <R[EAD]>
  > <S[EQ]>
  > <P[RG]>

  Square brackets [] represent optional parameters.
  Angled brackets <> represent an instruction to the user to replace its contents with appropriate information.

  e.g   cbmread @n:filename,P > /dx/filename

  puts it back into the os9 environment. You must set the file attributes to make programs executable.

You can use the Waterloo EDIT program to copy files onto a standard CBM floppy from a SD drive. However, make sure they are in lower case after copying across. You can format a standard 8050 floppy and copy files onto it and use cbmread to transfer them into the os9 'rel' file in OS9.

I have also used CBMCOMMAND but again make sure the files are in lower case using the waterloo EDIT program.

Below is a link to a useful manual on the OS9 assembler and also the EDIT program which can be used to create C or Basic09 programs

http://www.colorcomputerarchive.com/coco/Documents/Manuals/Programming/OS-9%20Editor%20-%20Assembler%20-%20Debugger%20Manual%20(Microware%20System%20Corp).pdf

EDIT program

https://www.roug.org/retrocomputing/os/os9

Type Edit

Program Disk Images

c-compiler.d80 :- User manuals can easily be found on the internet.

http://www.roug.org/soren/6809/ccguide.pdf

- I created two relative file disks in this image, /d0 and /d2 in drive 0.

- /d0 contains the compiler programs, defs and libs

- /d2 is the data disk.

- To compile a program, you first issue the commands
    - chx /d0/cmds
    - chd /d2

- Then issue the command
    - cc1 /d0/mat2.c -f=/d2/mat

        the -f tells the compiler where to put the executable. There isn't enough space on /d0 and will error.

    - This simple c program just says hello wold!

- The C compiler modules in cmds were found on an 8250 readable image os9cmds.d80. This image has issues so I created new ones compatible with the CBM-8050. The libraries and def files were copied from a COCO website

    http://geneslinuxbox.net:6309/gene/nitros9/3rdparty/packages/ccompiler/

    I copied the header files into a text file, and used a hex editor to delete any '0A' LF characters as the compiler doesn't like them. This website has other OS9 programs though most are for Level 2.

Recently I acquired the official C-Compiler floppies (2 of) as .d80 images for Super OS/9

styograph.d80 – This is the Stylograph word processor

https://www.roug.org/retrocomputing/applications/stylograph/stylograph-color-computer-version.pdf

- Issue the commands

    - chx /d0/cmds

    - chd /d0

    - stylo intro

- stylo is the main executable for Stylograph and the command listed will load the document intro

- The cursor keys are not used in Stylograph. Instead, its

  - I =   up   &   , = down

  - J =   left   &   l = right

- To configure the TERMINAL further

  - Styfix /d0/cmds/stylo

- Then follow the menu options!

- Stylograph is now just for fun reminding us how things used to be with software of that era!

dynacalc.d80 - Dynacalc spreadsheet.

https://www.roug.org/retrocomputing/applications/dynacalc/dynacalc-dragon.pdf

- To run insert the floppy into Drive 0

  - chx /d2

  - chd /d2

  - Dynacalc

- /d0 is empty and can be used for data.

- This is a directory called SUPERPET. Look at the files in there as this is where I found a better keyboard mapping using the d8d8 module. This had a bug where /d2 and /d3 accessed the same rel file instead of B and C respectively. I used a Hex editor to correct it for the system floppy but haven't changed the os9.d8d8.mod file.

        Numeric Pad definition

```
--------------------------------------------------------------------------------
| Del Word        | Screen        | Scroll |   *Shift = mode ^Q
| Left            | Mode *        | Up     |   *Cntl  = mode ^K
---------------------------------------------------------------------------------
| Del Word        | Command       | Line   |
| Right           | Mode          | Down   |
---------------------------------------------------------------------------------
| Block ^B        |  Del          | Line   |
| Command         | Line          | Up     |
---------------------------------------------------------------------------------
| Insert          | Scroll        |
| Line            | Down          |
```

      Cursors

```
==>      Char right
<==      Char left
^==>     Word right
CDown   Line down
Cup         Line up
^CDown    Word left
Del         Delete char to left of cursor
^Del        Delete char under cursor
Home       Home cursor (on screen)
Clear        Delete a marked block
Repeat  same as DEL
Shft Es Erase to End Of Line

^Q ==>      Move to end of line
^Q <==      Move to start of line
^Q CDwn   Move to end of page
^Q Cup       Move to top of page
```

Also see the effect of ^Q on the numeric keypad.

adv.d80 - adventure program.

- Insert into Drive 1

- To run you first must load the adventure program into memory,

    o chx /d1/cmds

    o chd /d1

    o load /d1/cmds/adventure

    o then type 'advent' from the command prompt to run

basic09.d80 – basic09 program

http://www.roug.org/soren/6809/basic09.pdf

To run, type the following from the OS9 prompt

- chx /d1/basic

- then type 'basic09' from the command prompt assuming disk is in drive 1

dynastar.d80 – dynastar

To run, you must first load gotoxy into memory (loads the terminal settings for the SP9000) then type ds to run Dynastar

- chx /d0/cmds
- chd /d0
- load /d0/cmds/gotoxy
- Ds

Creating a RAM disk

A RAM disk is very useful when compiling code or copying modules in and out of OS9 'rel' files (you cannot create RAM disks in the latest version VICE 3.4).

To create, issue following commands
- dir /dram (this will produce an error but don't worry)

- format /dram (accept parameters shown and format)

Check disk correctly formatted

References

- Magazine: - TPUG Issue 23 1986 has references to OS9 utilities

- Superpet gazette: - volume 2, number 6, August-September 1985

- Superpet gazette: - volume 2, number 7, Oct-Nov 1985

- http://www.roug.org/soren/6809/os9guide.pdf

- http://www.roug.org/soren/6809/

- http://www.colorcomputerarchive.com/coco/Documents/Manuals/Programming/OS-9%20Editor%20-%20Assembler%20-%20Debugger%20Manual%20(Microware%20System%20Corp).pdf