10th Oct 2019, 5:30 pm #241

jncoleman
Diode

Join Date: Oct 2019
Location: Carlisle, Cumbria, UK.
Posts: 2

Re: Gemini 80-Bus System

What a pleasure and surprise to find you, and how good to know I'm not the only person with an interest in 80 Bus systems. I haven't read John Newcombe's posts in detail yet but I'll be pleased to help where I can, because I'm doing something similar with my own systems which came to light when we moved house recently. I have three.

(1) Nascom 3, in official case with dual drives. Includes Nascom2 , FDC, AVC, MAP80 256K RAM and the little Phoenix monitor.

(2) Nascom 2, 19" rack mounted, inc. Nascom2, 48K RAM B, I/O.

(3) Gemini Galaxy 1 in official enclosure, inc. GM813 CPU, FDC, SVC, RAM-Disk, Climax colour, 64K RAM and Gemini keyboard.

I also have any amount of CP/M software, including the Gemini, Nascom and MAP80 BIOS implementations, compilers and assemblers, and the Micropro suite (Wordstar etc).

(1) used to run CP/M, and I'm currently restoring that function. I reprogrammed the boot EPROM and rewired the decode links, which had been set up for some non-standard dual-boot arrangement with CP/M and NAS SYS. It's now OK except for the drives, which probably just need cleaning after 10 years in the attic.

(2) is the only one fully working, and in its current configuration can handle simple control applications. It used to be part of a larger Gemini-expanded system inc. floppy and Winchester, but I left the drives in a lab at work and infuriatingly someone assumed they were rubbish and threw them out, together with a lot of documentation, a Pluto

board, and another Phoenix monitor.

(3) doesn't have any disk drives, but when I manage to get hold of a replacement Gemini one I'll run CP/M on it, and write GSX drivers for the Climax board. I'd then like to get CP/M Plus or MP/M running, both of which are going to require a BIOS rewrite. I might just have to buy a BBC disk drive, but I like everything matching and am very keen to find a Gemini one.

I also have a Telcon Zorba machine which, unlike the Nascom, worked perfectly after 20 years of disuse, all its disks still readable. I intend to use this to write a BIOS for the other machines if I find their system disks are trashed.

I used to know my way round these machines fairly well, although I'm going to have to get back up to speed. I'll keep an eye on the thread and chip in where I can.

If Peter B in Carshalton still has the MP/M manual to spare (post 5th May), I'd be very grateful to take him up on the offer, and will put it to very good use.

Quote

11th Oct 2019, 3:09 pm #242

JohnBHanson
Hexode

Join Date: Aug 2009
Location: Worthing, Sussex, UK.
Posts: 445

Re: Gemini 80-Bus System

If you have bios source code or indeed any gemini utilities/source code I would love a copy. I am currently trying to get the MultiFormat bios running.

Shame about the pluto it is quite a nice graphics card. I have a pluto 2 which is even nicer just a shame it is 12 inches deep.

Quote

11th Oct 2019, 4:50 pm #243

jncoleman
Diode

Join Date: Oct 2019
Location: Carlisle, Cumbria, UK.
Posts: 2

Re: Gemini 80-Bus System

Yes, I've got a complete multiformat BIOS source, or at least, I did have. I remember modifying it several times and reassembling it. However, until I manage to recreate my Gemini QDDS drive, I don't know whether the disks are still readable. Do you have that format? How do I get in touch with you?

Quote

11th Oct 2019, 5:04 pm #244

cosmocat

Re: Gemini 80-Bus System

Triode

Join Date: May 2011
Location: Bristol, UK.
Posts: 25

Hi
I also love these systems. I have a Nascom2 (with FDC, 48kRAM, AVC, IO) .
If you are stuck for Disk drives I ended up using disk drives meant for a BBC micro to get my system working. The TEAC FD55F drives were used on those made switchable for 40/80 track. I fixed the drives to 80 track and NASDOS was quite happy. Presumably other 40/80 track drives will likewise be compatible. BBC floppy drives are always up on ebay quite cheap.
I have been using it with NASDOS but I want to try PolyDos and CP/M. I have the boot ROMS but I need the boot disks. I have found disk images online but don't have any means to turn the images into real disks! If anybody has boot disks I would love a copy.

Quote

11th Oct 2019, 6:18 pm #245

JohnBHanson
Hexode

Join Date: Aug 2009
Location: Worthing, Sussex, UK.
Posts: 445

Re: Gemini 80-Bus System

To write disks from a PC (with a inbuilt floppy drive) I have used
http://simonowen.com/samdisk/

SamDisk quite successfully.

Quote

18th Oct 2019, 7:37 pm #246

NealCrook
Triode

Join Date: May 2019
Location: Reading, Berkshire, UK.
Posts: 29

Re: Gemini 80-Bus System

Hello cosmocat, hello jncoleman. I started a new thread to describe my NASCOM projects, which you might be interested in.

@cosmocat: I can lend you a PolyDos boot disk, but it is 35-track DSDD (350Kbyte). Another way is to use my SDcard adaptor connected to the PIO. It uses a special version of the Polydos ROM. You could probably use it as a way to boot-strap to a real disk drive.

@jncoleman: I'd be interested to hear about the history of your 3 machines, as I guess at least one of them must have had to earn its keep in its younger days. My own NASCOM 2 (+MAP Video/Floppy controller + MAP 256KRAM) was only ever used for "self-education" purposes.

Neal

Quote

20th Oct 2019, 10:44 pm #247

john_newcombe
Pentode

Join Date: Apr 2019
Location: Skipton, North Yorkshire, UK.
Posts: 141

Re: Gemini 80-Bus System

Quote:

> Originally Posted by **jncoleman**
> *Yes, I've got a complete multiformat BIOS source, or at least, I did have. I remember modifying it several times and reassembling it. However, until I manage to recreate my Gemini QDDS drive, I don't know whether the disks are still readable. Do you have that format? How do I get in touch with you?*

I would love to add any Bios source and Gemini software you have to the resource pages on https://glasstty.com/wiki/index.php/...ni_80-Bus_Saga feel free to send me a PM via this site.

Quote

21st Oct 2019, 8:50 pm #248

cosmocat
Triode

Join Date: May 2011
Location: Bristol, UK.
Posts: 25

Re: Gemini 80-Bus System

Hi Neal.
I might take you up on the offer of a boot disk but I am a little confused by these disk formats. Do you mean the drive the disk works with only steps over 35 tracks , and so the track spacing would be incompatible with a 40/80 track drive? How does PolyDos know how many tracks the drive works over?
I have taken a copy of your PolyDos3 image (that one seems most compatible with my hardware) from your github and I was mulling the possibility of writing a program on the Nascom to read the disk image (in sections) over the serial port (from a PC) then using low level NASDOS routines to write the disk tracks so that when the PolyDos boot rom was installed the files would appear correctly. I was unsure if this approach would work though.
I think I may instead look at your SDcard adaptor as you suggest.

JohnBHanson. Thanks for the suggestion but unfortunately the march of progress is such that none of my PCs have floppy drive interfaces on the motherboards anymore so I can't write a disk.

Andrew.

Quote

21st Oct 2019, 9:24 pm #249

john_newcombe
Pentode

Join Date: Apr 2019
Location: Skipton, North Yorkshire, UK.
Posts: 141

Re: Gemini 80-Bus System

Quote:

> Originally Posted by **cosmocat**
> *I have found disk images online but don't have any means to turn the images into real disks!*

Although I cant speak for the Nascom disks, I have used a BBC 40/80 track drive formatted for 35 tracks for use on the Gemini with the DDDS 360k disk format.

One approach I have used to create a real disk, is to boot to a Gotek (see https://glasstty.com/wiki/index.php/...ni_80-Bus_Saga) and copy sectors/files across to the real disk.

Quote

22nd Oct 2019, 1:18 am #250

JohnBHanson
Hexode

Join Date: Aug 2009
Location: Worthing, Sussex, UK.
Posts: 445

Re: Gemini 80-Bus System

35 track drives have the same track spacing as 40 track drives - which is double that of an 80 track drive. So reading a 35track disk can be done witha 40 track or 80 track drive. In PC terms that is either a 360k drive or a 1.2M drive.

Gemini formats has a shortish lead in from the index hole to the start of the first sector and this can cause problems with 765 floppy controllers.

The only real z80 machine I have is a matmos/alphatronic PC - and it has a 765 disk controller. I have written a multi-format bios for it. I have upgraded its floppy disks to 1.44 MByte 3.5 inch drives having had problems with its original floppies from the early 80s deteriorating. I do have plans to add other drives at some point - its a matter of building the cables and cases at some point.

Quote

22nd Oct 2019, 1:19 am #251

JohnBHanson
Hexode

Join Date: Aug 2009
Location: Worthing, Sussex, UK.
Posts: 445

Re: Gemini 80-Bus System

PS - If you can publish the source for your SD card patch via a PIO I would be interested.

Quote

22nd Oct 2019, 6:17 pm #252

NealCrook
Triode

Join Date: May 2019
Location: Reading, Berkshire, UK.
Posts: 29

Re: Gemini 80-Bus System

@cosmocat >> I was mulling the possibility of writing a program on the Nascom to read the disk image (in sections) over the serial port (from a PC) then using low level NASDOS routines to write the disk tracks so that when the PolyDos boot rom was installed the files would appear correctly. I was unsure if this approach would work though.

I'll start a new topic to discuss this

@JohnBHanson >>PS - If you can publish the source for your SD card patch via a PIO I would be interested.

I did not drive the SD card directly from the PIO (too much nascom-side software, particularly if any kind of file-system is needed) instead the PIO is connected to ports of an Arduino Nano, and the SDcard is attached to the Nano. This allows existing FAT library to be used for file-system-based storage, and allows a simple and high-level command interface between the NASCOM and the Arduino. Example program:

https://github.com/nealcrook/nascom/...ams/sd_wr1.asm

Neal.

31st Oct 2019, 9:41 am #253

john_newcombe
Pentode

Join Date: Apr 2019
Location: Skipton, North Yorkshire, UK.
Posts: 141

Re: Gemini 80-Bus System

Hi All, I am having a little trouble with my GM829 Floppy/SASI controller and need some expert help. I am in the process of adding Winchester support to the GM812 CP/M bios and during this process found that I am unable to communicate with any disk/controller I connect to the SASI port. Floppy disks work fine.

I have a very small snippet of code to test the port (see below) and I am getting results that puzzle me.

As far as I understand it, the SASI port works using addresses E5h (Control/Status) and E6h (Data). Simply looking at the control/status for now, the port is implemented as follows;

On reading the port e.g IN A,(0E5h):

Code:

```
Bit       Signal
 0         -REQ
 1          I/O
 2          C/D
 3         -MSG
 4         -BUSY
```

On writing to the port e.g. OUT (0E5h),A

Code:

```
  Bit      Signal
   0        -ATN
   1        -SEL
   2        -RST
```

Single stepping the code below whilst monitoring the -SEL line (without a disk/controller connected) I would have expected to see activity on the line but I don't. Checking the circuit diagram shows me that there is a buffer (IC1) which is enabled from the port decoding logic, in particular IC24 (pin 10) which is bit 1 of the 'B' demux. I do see this on pin 13 of IC 1. From this I deduce three possibiltles...

1. IC1 is not working
2. the data is not being placed on the data bus
3. My understanding of this process is wrong!

I suspect it is 3, however, I would really welcome your thoughts. I have attached the circuit diagram for reference. Just to pre-empt a few questions, the GM829 board is correctly set for E00h operations and the code below is compiled as a separate .com file.

Code:

```
        .Z80
        ASEG
        ORG 0100H
        .PHASE 0100H

.1797   EQU     0E0H            ;Base address
WCTRL   EQU     .1797+5         ;SASI (Winchester) control/status port
WDATA   EQU     .1797+6         ;SASI (Winchester) Data port

TEST:

        LD      A,5
        OUT     (WCTRL),A               ; set the -SEL
        IN      A,(WCTRL)               ; read status
        LD      A,7                             ; reset -SEL
        OUT     (WCTRL),A               ; set the -SEL
        IN      A,(WCTRL)               ; read status
        JR      TEST                            ; loop
```

Attached Files

GM829_Circuit.pdf (999.7 KB, 7 views)

Quote

31st Oct 2019, 11:02 am #254

JohnBHanson
Hexode

Join Date: Aug 2009
Location: Worthing, Sussex, UK.
Posts: 445

Re: Gemini 80-Bus System

Remember IC1 only has its outputs enabled for the duration of the write cycle. This gives a pulse width that is actually shorter than the SCSI standard. The GM849A fixes this problem but the software has to write the active followed by the inactive state (Which your sample code does).

However your code will only set -SEL active for the duration of the first output cycle. Maybe the resultant pulse is too short for your SCSI to SD converter.

Quote

31st Oct 2019, 2:05 pm #255

john_newcombe
Pentode

Join Date: Apr 2019
Location: Skipton, North Yorkshire, UK.
Posts: 141

Re: Gemini 80-Bus System

Quote:

> Originally Posted by **JohnBHanson**
> *Remember IC1 only has its outputs enabled for the duration of the write cycle. This gives a pulse width that is actually shorter than the SCSI standard. The GM849A fixes this problem but the software has to write the active followed by the inactive state (Which your sample code does).*
>
> *However your code will only set -SEL active for the duration of the first output cycle. Maybe the resultant pulse is too short for your SCSI to SD converter.*

OK thanks, that is something to look out for, but for the moment, with the SCSI controller disconnected I should see the pulse even if it is a little short right?

I am using a logic probe that captures pulses, it certainly sees the IC1 enable but not the -SEL. Hmmm.

Quote

31st Oct 2019, 3:39 pm #256

JohnBHanson
Hexode

Re: Gemini 80-Bus System

Join Date: Aug 2009
Location: Worthing, Sussex, UK.
Posts: 445

You may need pullups on the SCSI lines to see it with your logic probe or at least something else on the SCSI bus.

Try measuring the voltage at pin11 and check it is within range (It should be a valid high level). If not pullups or suitable scsi device on the bus is required.

Quote

31st Oct 2019, 5:03 pm #257

john_newcombe
Pentode

Join Date: Apr 2019
Location: Skipton, North Yorkshire, UK.
Posts: 141

Re: Gemini 80-Bus System

OK I will do some more tests with a genuine SCSI disk. I now have a half height IBM 3160 drive I can attach so I will try that first and then rig up some pull ups.

Many thanks.

Quote

2nd Nov 2019, 8:04 am #258

john_newcombe
Pentode

Join Date: Apr 2019
Location: Skipton, North Yorkshire, UK.
Posts: 141

Re: Gemini 80-Bus System

Quote:

> Originally Posted by **JohnBHanson**
> *You may need pullups on the SCSI lines to see it with your logic probe or at least something else on the SCSI bus.*
>
> *Try measuring the voltage at pin11 and check it is within range (It should be a valid high level). If not pullups or suitable scsi device on the bus is required.*

I had been checking whilst single stepping under Gemdebug and could not see the -SEL signal, however, when the code is run at full speed I can see the -SEL activity. I can also see that with the disk connected the line is pulled up. After each -SEL I read the status and I always get FFh. I am wondering g if I have hit the issue you mentioned.

I noticed from the manual that the GM849A latches the -SEL, is that correct? I don't have a circuit diagram for that card.

I also noted that the SCSI2SD I am using has a Xebec Quirks mode, I will investigate what that offers also.

Quote

2nd Nov 2019, 2:38 pm #259

JohnBHanson
Hexode

Join Date: Aug 2009
Location: Worthing, Sussex, UK.
Posts: 445

Re: Gemini 80-Bus System

The write cycle was too quick for the SCSI spec but worked with the xebec. The GM849A came about as a fix to allow tape streamers to work.

look at https://80bus.co.uk.mirror.jloh.de/p...mini/gm849.htm

I have a GM849A circuit diagram - but too large to post here.

Quote

2nd Nov 2019, 4:27 pm #260

JohnBHanson
Hexode

Join Date: Aug 2009
Location: Worthing, Sussex, UK.
Posts: 445

Re: Gemini 80-Bus System

Just a thought when activating sel you need to have one of the data lines active to indicate the address on the scsi bus you are selecting.

Typically for the xebec card this will be D0 (eg scsi address 0) by outputting 0feh to port 0e6h

Quote

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