UK Vintage Radio Repair and Restoration

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Vintage Computers Any vintage computer systems, calculators, video games etc., but with an emphasis on 1980s and earlier equipment.

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6th Jun 2019, 11:56 am

#**81**

john_newcombe
Tetrode

Join Date: Apr 2019
Location: Skipton, North Yorkshire, UK.
Posts: 51

Re: Gemini 80-Bus System

Quote:

> Originally Posted by **JohnBHanson** ▷
> *As for a disk, almost any disk with single ended SCSI 50 pin connector will work with the GM829 - I have used a 100MByte disk onto a GM849 (similar) before I wrote the emulator.*

It's time to add a hard disk to my Gemini, well sort of. Flushed with the success of booting to a Gotek, with much help from JBH and others, I now have in my possession a SCSI2SD adapter (5.1) ready to be connected to the Winchester port of the GM829 controller.

My aim is to emulate a SASI disk drive for use with CP/M. I am not needing to boot to this disk, just be able to use it.

As you will no doubt be aware I have little knowledge of this stuff, and am looking for a clue as to how to get started.

To try and get a feel for what is required I thought I would add a hard disk to the xbeaver gemini emulator (full config below). This was shown to have been configured in the verbose xbeaver log, but I have no idea how to access this drive.

Included on the xbeaver hard disk image there was a TSHD formatter for a TS-802H Televideo machine, not sure if this is useful to me.

Any thoughts or comments would be most welcome.

Code:

```
verbose

cpuclock 4

board 0xfe gm813_mmu

board 0x20 gm816_clock
board 0x30 telnetd 3000
board 0x34 printer bxerox beps500 landscape general gbro425 pecker
board 0xb0 gm832 BeaverBoot yellow
board 0xb8 serial_8250 bvrnet ~/beaver/HardDisk
board 0xe0 gm829_floppy -geometry D35.2.10.0.512 ~/beaver/images/GM512_64.DMP ~/b
board 0xe0 gm829_scsi  harddisk.dsk

board 0xfb gm833

binload 0xf000 ~/beaver/roms/RPM_2.3.ROM
byte 0f0a8 21 00 f0 #Patch top of ram for RPM

byte 0000 c3 00 f0
```

#82

JohnBHanson
Hexode

Join Date: Aug 2009
Location: Worthing, Sussex, UK.
Posts: 358

Re: Gemini 80-Bus System

Port e1 is status/control
Port e2 is data

If you wanted to you could probably connect an SD card directly to the scsi bus with just some level shifters. Looking at the scsi interface /req, C/D /MSG and /BUSY are input signals.

By tieing I/O you can set D0..D7 to be input or output - best to use them as output.

This provides you with 4 inputs and 8 outputs which should be enough to drive an SD card with some custom software. There are Sd card drivers available on the net for Z80.

JohnBHanson
Hexode

Join Date: Aug 2009
Location: Worthing, Sussex, UK.
Posts: 358

📄 **Re: Gemini 80-Bus System**

Look at /sgsbcsd2491/CPM/BIOS/sd/ in the attached download. This is a bios for
working with an sd card. You can use the scsi port as shown in the previous post or use the Z80 PIO port to get the
signal lines.

┌─ Attached Files ──
│   🖥️ sdcard.zip (456.2 KB, 2 views)
└───

john_newcombe
Tetrode

Join Date: Apr 2019
Location: Skipton, North Yorkshire, UK.
Posts: 51

📄 **Re: Gemini 80-Bus System**
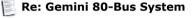
I have the scsi2sd connected with xebec quirks mode set. I am just not sure how to format the drive? Is there some
hd prep software I should be using? Does the drive just appear as c: or e: or something?

JohnBHanson
Hexode

Join Date: Aug 2009
Location: Worthing, Sussex, UK.
Posts: 358

📄 **Re: Gemini 80-Bus System**

For the drive to appear you need support within the bios. I don't have a copy of a Gemini Bios for a hard disk - but I
am sure someone will.

The xebec controller has a jumper for 256 or 512 byte sectors you will need to set this correctly.

Normally drives with a SCSI interface are already formatted. Drives that have the MFM interface and are controlled
by the xebec adapter will need to be formatted. I don't know where you scsi emulator fits in with this, but I suspect
that the drive does not need to be formatted as you have a SCSI emulator. See attached....

to compile these you need the gemzap program do the following

gemzap
=rwinch

```
=a o=winch
=q
```

┌─ Attached Files ───┐
│ 📁 winch.zip (2.5 KB, 3 views)   │
└──┘

🟢 ⚠️   [Quote] [?+] [📝]

8th Jun 2019, 2:45 pm   #**86**

john_newcombe
Tetrode

Join Date: Apr 2019
Location: Skipton, North
Yorkshire, UK.
Posts: 51

🟢 ⚠️

📄 **Re: Gemini 80-Bus System**

Many thanks.

                                                                [Quote] [?+] [📝]

13th Jun 2019, 6:44 pm   #**87**

john_newcombe
Tetrode

Join Date: Apr 2019
Location: Skipton, North
Yorkshire, UK.
Posts: 51

📄 **Re: Gemini 80-Bus System**

Quote:

┌──┐
│ Originally Posted by **TonyDuell** ▶   │
│ *I'm not sure I'd call it an 'interest' as I've not done anything with it for a couple of years, but I have one of* │
│ *these machines.*   │
│   │
│ *Mine has 3 boards in the cardcage -- CPU, Video, and hard/floppy disk controller. There's a single 5.25"* │
│ *floppy drive and a (electrically) small hard disk. I do have the original keyboard and what I was told was the* │
│ *video monitor normally used with this machine, a Hantarex unit.*   │
│   │
│ *Mine has some kind of network interface too. It connects to the parallel port on the CPU board. The numbers* │
│ *had been scratched off the ICs which meant it took me a couple of minutes to identify them. The main IC was* │
│ *a dumb UART (amazingly)*   │
│   │
│ *Alas no software. The hard disk contains the OS (enough to boot the machine anyway) but nothing else.* │
└──┘

Tony:
I was wondering what ROM you had in the CPU card that boots directly to the hard disk, was it Simon?

I am keen to both archive as much as I can and get my own SCSI disk working with my system. I desperately need a

CP/M version with Winchester disk support. The version I have (GM512) doesn't seem to support these disks.

I am wondering if there was any way to image/copy your system tracks. And any ROMs on the boards.

TonyDuell
Dekatron

Join Date: Jun 2015
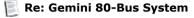Location: Biggin Hill, London, UK.
Posts: 3,080

Re: Gemini 80-Bus System

I came across this machine the other day (you don't know my house, while doing that I came across a PDP11 that I didn't know I owned...) and it's now where I can get to it. I've not set it up yet.

But I can easily remove the cover, pull boards and see what ROMs I have, etc.

---

john_newcombe
Tetrode

Join Date: Apr 2019
Location: Skipton, North Yorkshire, UK.
Posts: 51

Re: Gemini 80-Bus System
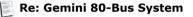
Many thanks, I felt quite bad asking but feel better now that you found a PDP11 🙂

TonyDuell
Dekatron

Join Date: Jun 2015
Location: Biggin Hill, London, UK.
Posts: 3,080

Re: Gemini 80-Bus System

Oh, I know where most of my PDP11s are -- the large Unibus ones in rack cabinets, etc. This was just a little 2U high box with an LSI11 CPU board, RAM, and a couple of interfaces in it. Not actually the smallest PDP11 I own, but close.

From memory, my Gemini contains a CPU board, IVC board, and floppy/SASI board. The latter goes to some bridge board thing (I want to say Adaptec, but it may be Xebec or somebody else) and to an ST412-interfaced hard disk. One of the ports on the CPU board goes to that network interface I mentioned.

I also have (and have put with the machine!) the original keyboard and cable. Also what I believe was the video monitor used with it originally. Just a composite video monochrome thing of course.

Interestingly, I have a Torch-branded lightpen for the BBC micro. This consists of an inteface that plugs into the

Beeb's analogue socket (DA15) and a light pen that plugs into the interface using a 5 pin DIN connector. That DIN connector is the right pinout to plug into the IVC lightpen socket.

---

john_newcombe
Tetrode

Join Date: Apr 2019
Location: Skipton, North Yorkshire, UK.
Posts: 51

Re: Gemini 80-Bus System

It sounds like you have a large collection of interesting stuff.

My machine is similar to yours in that I have a G811 CPU, MAP256(64k) IVC and a G829 Floppy/SASI.

I have three goals;

The first is to get CP/M to recognise the SCSI disk I have connected, it is actually the SCSI2SD emulator set to Xebec mode. I clearly need the Gemini BIOS that had Winchester disk support, and it seems like you have something similar installed on your hard disk.

The second is to archive as much software/firmware as I can as there seems to be very little left out there for these machines. I have been broadcasting on Twitter, Yahoo Groups, Google Groups, Facebook Groups etc. With very little response.

The third is to fix my IVC which appears to be an issue with the IVC 2.0 ROM. The item worked for a while and then the CPU failed, I have swapped the CPU and most signals seem good except the software driven IO line emanating from the CPU. I may have a suitable image from the first 2k of the SVC ROM but have not had chance to test this.

Any help you can offer would be most welcome.

https://glasstty.com/wiki/index.php/...ni_80-Bus_Saga

JohnBHanson
Hexode

Join Date: Aug 2009
Location: Worthing, Sussex, UK.
Posts: 358

Re: Gemini 80-Bus System

The hard disk image you have with my emulator has some software. type shell as a command to access a menu driven system that will help you through. (This is driven from a file called menus.shl).

PS - the 2k range from the SVC Rom is for the character set generator on the IVC card and not a Z80 program which lives in the other EEPROM.

john_newcombe
Tetrode

Join Date: Apr 2019
Location: Skipton, North
Yorkshire, UK.
Posts: 51

Re: Gemini 80-Bus System

Thank you John, I will investigate further.

You are right of course re: SVC ROM, my bad. I do now have an image of the IVC 2.0 ROM so once I get the EPROM programmer up and running I can hopefully sort things out.

Just need to get hold of that elusive Gemini Winchester version. Perhaps there are options with your own VP/M or the other flavours of CP/M? As you know I am a bit of a newbie with the whole CP/M modification stuff. Just need CP/M to recognise the disk, not needing to boot from it.

Tony/John Once again many thanks for all the help it has kept me going with this little project.

Quote

JohnBHanson
Hexode

Join Date: Aug 2009
Location: Worthing, Sussex,
UK.
Posts: 358

Re: Gemini 80-Bus System

VPM/M requires the memory management of the GM813 card to run. However VPM/M is a program that runs under BDOSZ/CCPZ/BIOS. BDOSZ and CCPZ are freeware/shareware programs.

The BIOS is largely written by me - so it would be possible on your system to run just ccpz/bdosz but it would need a different boot rom

you will probably need to set
svcard false
vidcard true
emucard false

Note that escape during startup enters a simple monitor (? gives help)
Note - the floppy disk format supported by tbios is *NOT* the same as the gemini format

All of this was written without reference to the gemini system or CP/M - deliberately saves on cost

Attached Files
📁 hdboot.zip (50.2 KB, 2 views)
📁 bdosccpz.zip (42.8 KB, 2 views)

Quote

john_newcombe
Tetrode

Join Date: Apr 2019
Location: Skipton, North
Yorkshire, UK.
Posts: 51

Re: Gemini 80-Bus System

Thank you for the info. I will look it over carefully.

I would be fascinated to here more about your history with this stuff, you have clearly spent a lot of time and effort getting to grips with it all.

J

TonyDuell
Dekatron

Join Date: Jun 2015
Location: Biggin Hill, London,
UK.
Posts: 3,080

Re: Gemini 80-Bus System

Here, as promised, are details of the boards in my machine.

There are 3 boards in the backplane :

GM829 Issue 2 FDC/SASI. This is cabled to the floppy drive and to a Xebec board linked to the ST412-interface hard disk.

GM812 Issue 2 IVC. Has ROMs IVC-MON V2.0 and IVC-GEN V1.0

GM813 Issue 3 CPU. Has ROM Simon V3.1MP

The IVC board has cables to the lightpen socket (5 pin DIN), video output (SO239) and Keyboard (DA15) on the rear of the case. I do find the use of a 1/4" jack for the video connector on the board a little odd.

The CPU board has cables to the cassette socket (5 pin DIN), serial (DB25) and parallel (36 pin Microribbon ('Centronics')) on the back. There's also a network card screwed to the side of the cardcage, its ribbon cable would fit in place of the parallel socket cable on the CPU board.

JohnBHanson
Hexode

Join Date: Aug 2009
Location: Worthing, Sussex,
UK.
Posts: 358

Re: Gemini 80-Bus System

Looks like Tony has would have the gemini hard disk system that John wants a copy of - maybe you could post a disk image and or the roms.

john_newcombe
Tetrode

Join Date: Apr 2019
Location: Skipton, North
Yorkshire, UK.
Posts: 51

Re: Gemini 80-Bus System

If that could be done, that would be amazing. I would need the Simon ROM and the disk image. I have the IVC ROM images. It would be good to get this stuff archived.

john_newcombe
Tetrode

Join Date: Apr 2019
Location: Skipton, North
Yorkshire, UK.
Posts: 51

Re: Gemini 80-Bus System

In the meantime I have been re-reading and re-reading the posts in this thread and the good news is that I am really starting to get my head around the bios changes required to get the 80 track disks incorporated.

I have been looking at the source code and can see that to support the GEMQDDS 80 track format I need to change a couple of Equates. This recalculates the tables correctly (scheme b) and sets the CHK and ALL buffers to the correct sizes. I now understand how to build the bios using .org/.phase etc. and that I have to transfer the resultant multi.com to the relevant portions of the disk.

Doing it this way seems the most natural and would support any Gemini disks should they ever turn up, however, this also would cause a block size change to 4k.

From this point I have two routes, my A: drive is a Gotek and I can manipulate the disk images in anyway I need, assuming I know what I need. My B: drive is a physical 80 track 5.25 drive which has already been used to format disks at 35 tracks (from RP/M) using the Format.com you sent me (it is not possible to format an image on the Gotek).

I have yet to research how the change in block size affects the disk format.

I am thinking that if I can get a suitable disk format utility (perhaps there is one on Tony's hard disk or in the public domain), I could format a physical disk in B: and then make an image of that. I could then easily add CP/M (with the new bios) on to the system tracks.
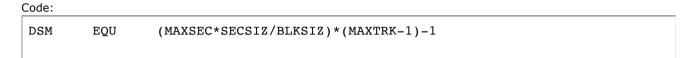
But... there is probably a better way.

john_newcombe

Tetrode

Join Date: Apr 2019
Location: Skipton, North
Yorkshire, UK.
Posts: 51

📋 **Re: Gemini 80-Bus System**

It just dawned on me, after re-re-re-re-reading JBH's posts that perhaps a better way, at least for now is to keep the block size the same as the GEMDDDS images I already have. Checking the Bios source, the CHK and ALL buffers are automatically adjusted to cater for the increased number of blocks as the EQU statements are calculated based on DSM which in turn is calculated from the the basic EQU statements at the top of the source.

Code:
```
DSM     EQU     (MAXSEC*SECSIZ/BLKSIZ)*(MAXTRK-1)-1
```

I am thinking that if I take this approach, I can simply make the disk images I have longer by adding empty (E5) sectors to the end of them. Not an original Gemini combination, but for now and as a learning exercise, it would be good.

Am I missing something?

🟢 ⚠️   ✏️ **Quote** 📝 ✏️

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Message:

| 🅰 | **B** | *I* | U̲ | **A** ▾ | 🌐 | 🗨 | ↕

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