Rather than start a new thread for each update on this project, I've decided to create a single thread and update it as required. This is that thread.

Background

This is my second homebrew project after first completing a Ben Eater inspired SAP-1ish on a breadboard. Dipped my toe in 65C02 assembly working on some Commander X16 projects, so decided to do a 65C02 next. Loved the idea of a backplane where I can easily add/replace components of the build at will. I also have a soft spot for the TMS9918A having grown up with a TI-99/4A. So that was my starting point. (Yes, I'm quite a newbie at this - but have a very extensive background in software).

I started out building the project on breadboards, but then designed a backplane and custom proto card to start the build proper. I started out with a graphics LCD:

Then built the TMS9918A card and added support for a NES controller:

It was around this point I started working on the emulator. For this, I wrote my own 65C02 and TMS9918A emulator libraries and built both a desktop and web-based version. You can try the latest web version here (requires keyboard): https://visrealm.github.io/hbc-56/emulator/wasm

Not long after that, I was contacted by PCBWay who were keen to supply me with PCBs in return for mentioning them (nothing more than that). This surprised me as my project / YouTube, etc. has very few followers, but I decided to go ahead anyway. This gave me the perfect opportunity to design custom PCBs to replace the old hand-wired ones.

The brings me to the present day where I've started building out some of these new cards and documenting the process in video form. It's not all smooth-sailing and you might get something out of these. If you're interested in TMS9918A development, I'm planning to do some videos on that specifically soon (probably after the card build series).

Updates

28 May 2022

The new RAM/ROM card. It contains 64KB RAM + 32KB ROM with runtime-configurable selection of RAM or ROM in 4KB pages.

23 May 2022

Video covering the schematic, PCB design, assembly and testing of my new TMS9918A display card

16 May 2022

Video covering the schematic, PCB design, assembly, diagnosis, repair and testing of my new 65C02 CPU card

Project links

GitHub: https://github.com/visrealm/hbc-56

YouTube: https://www.youtube.com/playlist?list=PLhBwUsBsKBEMxZFNBWzE2UhNCxNknMrcR

Emulator (live online instance, requires keyboard) :
https://visrealm.github.io/hbc-56/emulator/wasm

Hackaday: https://hackaday.io/project/180904-hbc-56-65c02-tms9918a-on- a-backplane

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Subject: Re: HBC-56 project
Posted by visrealm on Tue, 24 May 2022 12:48:41 GMT
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All five cards now built. Updates for each to follow in coming weeks.

Subject: Re: HBC-56 project
Posted by simonj5 on Wed, 25 May 2022 09:36:41 GMT
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Very nice; the videos are most interesting giving an insight into your process.

I can't wait for all of the gerbers to be on GitHub and the designs to be accessible on EasyEDA (I get some message about EasyEDA upgrading...)! ;-)

Simon

Subject: Re: HBC-56 project
Posted by visrealm on Thu, 26 May 2022 03:50:36 GMT
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Thanks, Simon.

As I'm sure you'll understand, I want to hold off releasing Gerbers until I have boards that don't require bodges and I'm 100% happy with.

Of the last batch of five boards, two are good, two have reasonably significant bodges (they work now) that will require a re-spin and the 5th I'd like to add one more feature to improve usability.

Subject: Re: HBC-56 project
Posted by visrealm on Sat, 28 May 2022 14:03:06 GMT
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The next HBC-56 video is now available. This time covering the new RAM/ROM card. It contains 64KB RAM + 32KB ROM with runtime-configurable selection of RAM or ROM in 4KB pages.

Subject: Re: HBC-56 project
Posted by visrealm on Wed, 01 Jun 2022 13:40:49 GMT
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A brief montage of mostly unreleased footage covering the first 12 months of my HBC-56. From breadboards to custom protoboards to today.