

MCM Design Announcement  
By Michael Matte  
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ANNOUNCEMENT - MCM Design's 3rd And Final Hi-Res Astrocade Prototype  
Feb 2021

Below is MCM Design's vision for its final low/hi-res static screen RAM (SRAM) Astrocade, a wire wrapped prototype with a 3 board add-under.

#### MODIFIED ASTROCADE MOTHERBOARD

The motherboard will be modified to run the low/hi-res static screen RAM add-under Board 1. Connection to Board 1 will be via a 28 pin dual in line (DIL) ribbon cable (RC) socket mounted at the bottom front of the motherboard. No 50 pin motherboard expansion lines will be required to run the screen RAM in Board 1.

#### Design Note:

The two custom data chip's Serial 0 (pin 11) and Serial 1 (pin 12) lines must be disconnected from ground. The hi-res video scan serial lines will be wired to pins 11 and 12.

#### ADD-UNDER BOARD 1 STATIC SCREEN RAM (SRAM) BOARD

Four 32KB static RAM chips utilized, providing  
4KB low-res mode, 160 x 102 pixel resolution or  
16KB hi-res mode, 320 x 204 pixel resolution  
either mode software selectable  
possible med-res mode 160 x 204 pixel resolution?

Optional hi-res 16KB 8 page multi-pager, total 128KB of screen RAM  
software selectable

Single +5v power operation

28 pin DIL RC socket mounted in front of Board 1 to connect to the motherboard  
28 pin DIL RC socket mounted in back of Board 1 to connect to Board 2

#### ADD-UNDER BOARD 2 USER ROM/RAM BOARD

- A. 32KB user hi-res ROM
- B. 32KB user RAM 6000-7FFFH
- C. 32KB user RAM 8000-FFFFH

A. 32KB user hi-res ROM, dual-carted with two 16KB banks  
ROM will be 32KB EEPROM with internal data protection enabled

Bank 0 addressed 0000-3FFFH  
16KB hi-res demos/games

Bank 1 addressed 0000-3FFFH  
0000-1FFFH  
low-res to hi-res conversion, UPI + subroutines

power up routine  
menu at power on?  
demo(s)?  
2000-3FFFFH  
sentinel at 2000H to indicate this ROM is active  
extended graphic subroutines with EUPI  
software support for Board 1 multi-pager?  
software support for Board 3 pattern transfer board?

Manual switches mounted in front of Board 2

1. DIP (mini toggle?) to disable low-res ROM, enable hi-res ROM  
low-res ROM only enabled option allows execution of already existing MCM Design 2000-3FFFFH programming along with hi-res programs that include all the necessary (self-contained) hi-res routines
2. mini toggle to disable (turn off) Bank 1 ROM 2000 - 3FFFFH  
toggle allows use of 8KB hi-res cartridge in cassette connector with access to only hi-res UPI plus subroutines at 0000-1FFFFH
3. mini toggle to select Bank 0 or Bank 1

B. 32KB user RAM, multi-carted with four 8KB banks  
addressed 6000-7FFFFH or 2000-3FFFFH via mini toggle  
28 pin ZIF socket  
compatible with EPROM/EEPROM using jumper reroute socket or optional pre-wired module

switches mounted in front of Board 2

1. 2000/6000H address mini toggle select switch
2. write protect mini toggle
3. two DIP multi-cart

C. 32KB user RAM addressed 8000-FFFFH

28 pin ZIF socket  
compatible with EPROM/EEPROM using jumper reroute socket or optional pre-wired module  
write protect mini toggle mounted in front of Board 2

Single +5v power operation

50 pin header socket to connect Board 2 to motherboard via RC  
50 pin header socket to connect Board 2 to Board 3 via RC  
28 pin DIL socket to connect to Board 1 multi-pager via RC

ADD-UNDER BOARD 3  
PATTERN TRANSFER BOARD

Similar to WOW pattern transfer board

single +5v power operation

50 pin header socket to connect to Board 2 via RC  
50 pin header expand socket to connect to remote BalcheckHR board via RC

AUDIO/VIDEO BOARD

A composite video driver and audio driver board with a quick connect replacing the Aztec RF modulator  
two RCA phono jacks mounted in back of the A/V board allowing A/V cables to run out the back of the Astrocade console

a ground wire to connect to the motherboard ground

#### ADD-UNDER CONSOLE WITH 3 BOARD RACK SET UP

MCM Design managed to purchase on eBay a 3 PC board rack styled support system for only \$15 plus shipping. This setup will hold 3 boards in the vertical or horizontal position.

The rack system will be mounted within an open framed stained wood console. Additional supports will be used to position the rack system precisely. MCM Design has access to a table saw, router and miter saw to create the console and supports. The Astrocade will be mounted on top of the wooden console having the same width and length as the Astrocade console.

An 8.5 x 17" Vector board prepunched for wire wrap socket installation will be cut in half to provide precise 8.5" wide WW boards for the 3 board rack system. All 3 add-under boards will be 8.5" square?

The rack set up will have to provide a means to allow the hook up of a frequency counter, logic probe, VOM or logic analyzer so the 3 boards can be troubleshooted with their +5v power on.

A +5v power supply and a fused custom 120vac jack for the Astrocade motherboard power transformer will also be mounted inside the wooden console. A main fused 120vac power on/off switch will be mounted on a side of the wooden console so that the motherboard and all 3 add-under boards can power on simultaneously. The motherboard rear mounted power on/off slide switch will be left in the "on" position for the simultaneous power on.

#### ADDITIONAL SOFTWARE SUPPORT

Modified Astrobasic cartridge with 32KB EEPROM multi-carted for four 8KB programs listed below

1. Astrobasic
2. Upgraded Bit Fiddler's MLM with 2000 baud audio interface subroutines including "An In-Depth Look At ..." series programs and demos?
3. Hi-res MLM with 2000 baud audio interface subroutines including hi-res demos
4. Hi-res Multi-Pager Test Demo

Note: 2 and 3 audio interface subs will be useable from 6000-FFFFH low-res, 8000-FFFFH hi-res

Hi-Res Incredible wizard, Hi-Res Seawolf plus ? in a 32KB package addressed 8000-FFFFH

Upgraded BalcheckHR board with 32KB diagnostic package

End OF MCM Design Document  
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