

The mini-MPI User's Manual

Congratulations on your purchase of a mini-MPI unit for Tandy Color Computers.

The mini-MPI for Tandy Color Computers and Dragon is a two-slot MPI device designed to let you use up to two cartridges or program paks at the same time on the system. It is a smaller, more compact alternative to a full sized Multi Pak Interface, allowing you to save desk space, as many MPI uses don't require more than two slots.



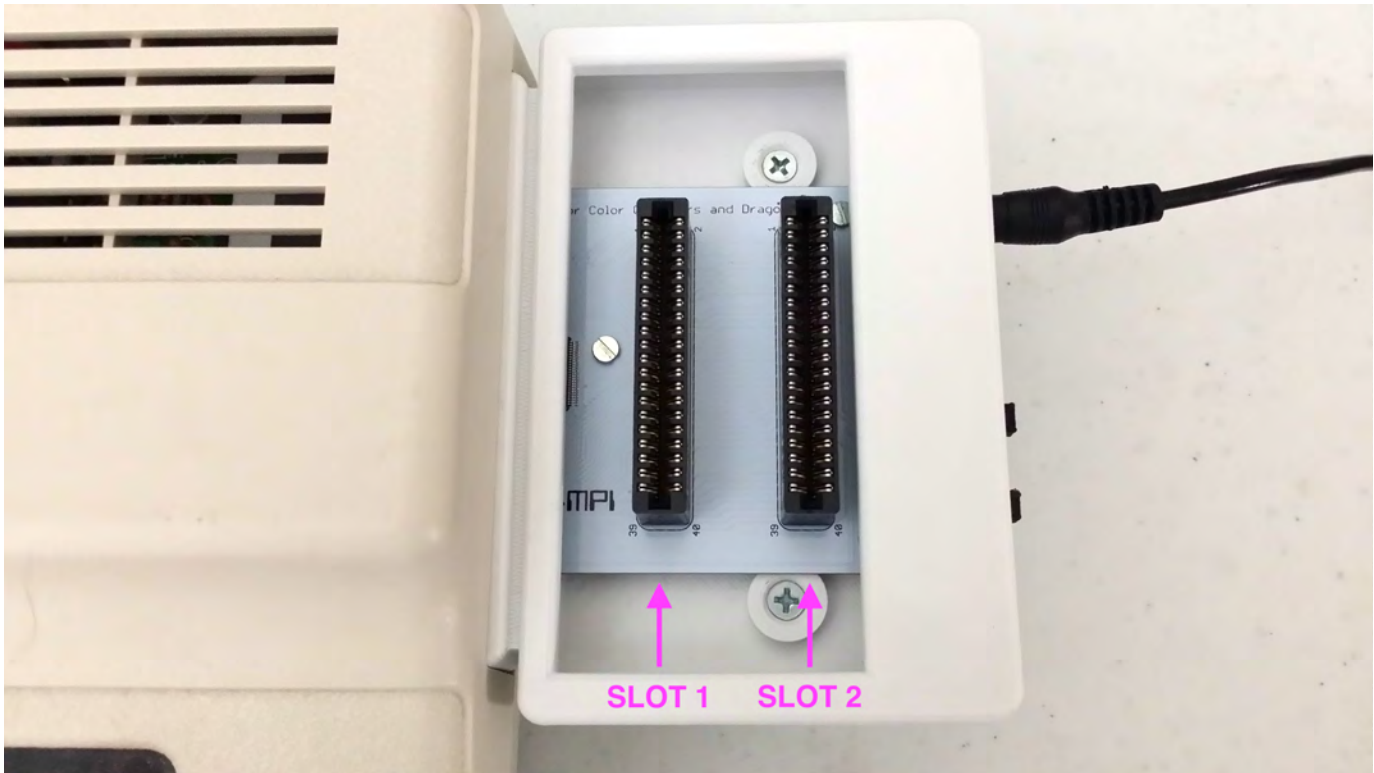
mini-MPI with CoCo3 and cartridges

The mini-MPI draws very little power from the host computer. Only about 30ma are consumed during operation. Even a single floppy disk controller would normally draw over 200ma. The mini-MPI powers all cartridges from an external supply, lightening the load on your computer's power supply.

The interface to the computer is fully buffered using 16-bit bus transceiver ICs. The necessary logic is contained in a CPLD (Complex Programmable Logic Device) positioned between the bus transceivers and the two cartridge slots.

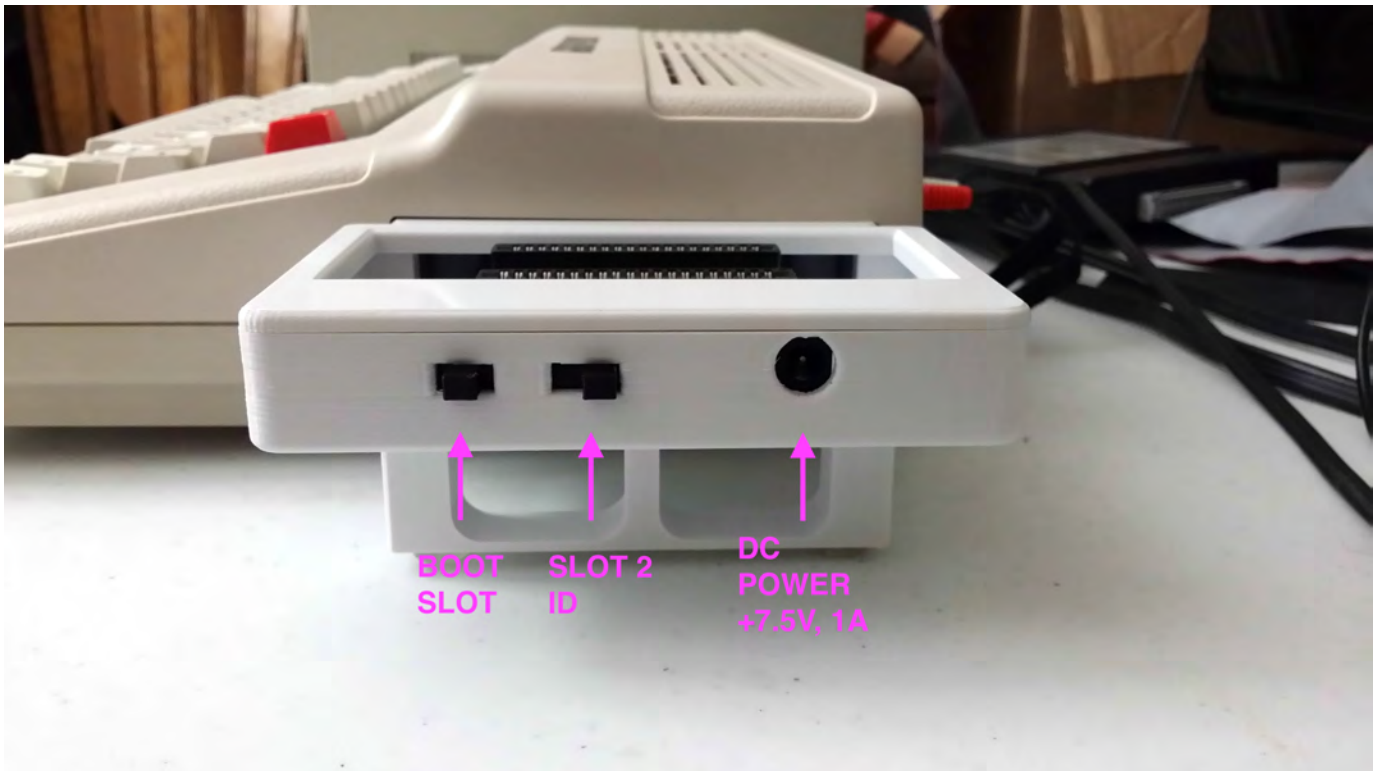
The Mini-MPI is powered by a +7.5V DC adapter rated at 1 amp.

Like any standard four-slot MPI, at it's heart lies an 8-bit register at \$FF7F which controls the routing of important control signals to the slots. This allows the cartridges to communicate properly with the computer, and each other.



Slot 1 is closest to the computer

Two switches determine the initial state of the register. The “Boot Slot” switch is a two position switch which will select either the first or second slot as the primary slot on startup. This slot will initially receive CART*, CTS*, and SCS*. The routing will change accordingly if the register is written to.



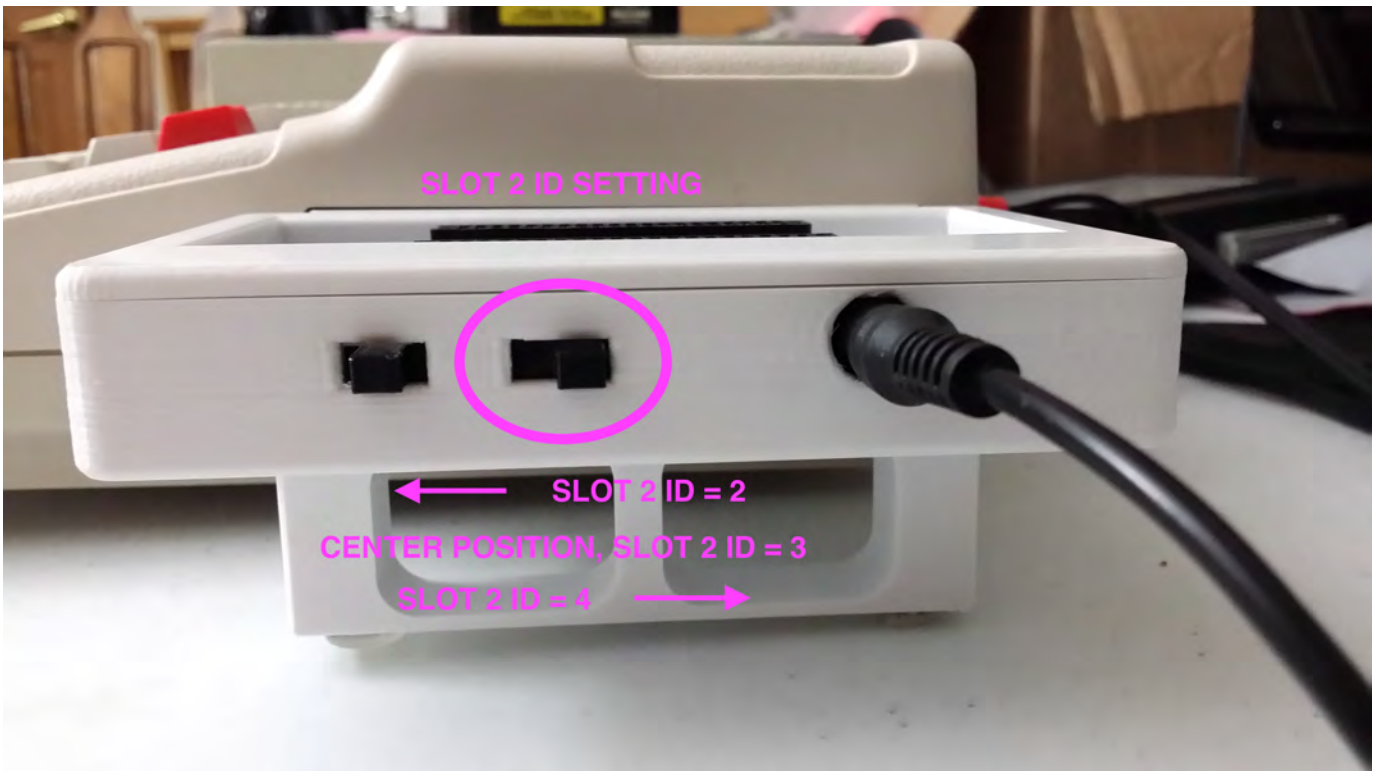
mini-MPI switches

Moving the Boot slot switch to the side closest to the user selects slot 1 as the initial startup slot. Away from the user toward the back of the machine will select slot 2 as the boot slot.



Boot slot switch settings

The second switch is a three position switch that determines which slot on the original MPI the second slot will correspond to.



Slot 2 ID setting

OPERATION

Setting up the mini-MPI

To use the mini-MPI, make sure the power to the computer is off, and the power adapter to the mini-MPI is not connected. Insert the mini-MPI into the cartridge port slot of the computer, making sure it is fully seated.

Next, connect the +7.5V power adapter, and insert the cartridges you'd like to use into the mini-MPI. Cartridges can be seated and removed with the DC power supply connected, as long as the Color Computer is off. The slots are not powered until the system is turned on.

Set the switches as desired, and power up the computer.

Switching between cartridges

During use, if the user wants to reboot one of the inserted cartridges, it is often possible to simply adjust the switches and press the system reset button. In many cases, this will reboot the system properly with the newly selected boot slot. However, because of the wide range of cartridges, how their memories are set up, and the many motherboard variations, cycling the system power will sometimes be necessary to fully reset the system. This is no more onerous than switching carts in a system with no MPI, where the computer must be fully powered off during the switch.

WHEN INSERTING OR REMOVING CARTRIDGES IN THE MINI-MPI, ALWAYS POWER OFF THE COMPUTER. DOING SO WITH THE POWER ON MAY DAMAGE YOUR COMPUTER, THE MINI-MPI, OR YOUR CARTRIDGES.

Using the register

Slot selection for the various control signals is determined by the value in the 8-bit register. Like a standard MPI, the register is located at memory location \$FF7F. Bits 1-0 determine which slot will receive the SCS* signal. Bits 5-4 determine which slot will receive CTS* and CART*.

The following chart illustrates how an MPI register selects which slot gets the signals based on register value. CART* and CTS* always go to the same slot, SCS* can be sent to another slot independently.

REGISTER @ \$FF7F	CART*		CTS*		SCS*				
BIT -	7	6	5	4	3	2	1	0	
<u>DECIMAL</u>	-----								
0	0	0	0	0	0	0	0	0	- SLOT 1 SELECTED
17	0	0	0	1	0	0	0	1	- SLOT 2 SELECTED
34	0	0	1	0	0	0	1	0	- SLOT 3 SELECTED
51	0	0	1	1	0	0	1	1	- SLOT 4 SELECTED

Values can be read or written to the register from software, or simply poked and peeked from the BASIC prompt.

To find out the current value in the register, type "PRINT PEEK (&HFF7F)" and press 'ENTER'. To set the register to a new value, type "POKE &HFF7F, n". The value can be any 8-bit number, but only bits 5, 4, 1, and 0 have any effect.

USING THE mini-MPI WITH SPECIFIC CARTRIDGE COMBINATIONS

One of the main uses the mini-MPI was designed for was the ability to use Darren Atkinson's excellent CoCo SDC along with other carts. Here are some specific examples of how to use various combinations.

Begin with the computer's power off, and the mini-MPI unplugged.

CoCo SDC and a Floppy Controller

Insert the SDC in the first slot, and the FDC in the second.

Set the boot switch for slot 1. Slot 2 ID can be any setting.

Plug the power adapter into the mini-MPI, and power on the computer.

The SDC will scan for a FDC as part of its startup routine, and use a FDC drive for any drive turned off on the SDC (Drive 0 or 1).

For instance, after SDC-DOS is booted, type "DRIVE 0, OFF". Now requests to Drive 0 will go to the Disk 0 on the FDC.

Floppy Controller and Orchestra 90

To use the Orchestra 90 with an FDC, insert the Orchestra 90 cart in slot 1, and the FDC in slot 2.

Set the boot switch for slot 1, and slot 2 ID as 4.

Plug in the mini-MPI and power up the computer.

The Orchestra 90 cart will now auto-start, with the FDC at slot 4 as it expects.

CoCo SDC and Orchestra 90

Insert the Orchestra 90 in slot 1 and the CoCo SDC in slot 2.

Set the boot switch to slot 2, and slot 2 ID to 4.

Plug in the Mini-MPI and power up the computer.

The system will boot to SDC-DOS. Mount the floppy image you'd like the Orchestra 90 to use as Drive 0.

Now start the Orchestra 90 by writing to the register. Type "POKE &HFF7F, 0".

The Orchestra 90 cart will now auto-start, with the SDC serving as its floppy drive at slot 4.

Thank you for supporting CoCo hardware and software developers, and I hope you enjoy and get a lot use out of your new mini-MPI!

- Ed Snider (AKA Zippster)

