RetroSpy
Technologies

SD Card System

Last Updated: 06/23/2024

The SD Card System Board

The RetroSpy SD Card System is a Raspberry Pi Pico implementation/clone of Corsham Technologies' SD Card System.

Features

- Provides SD card storage and retrieval of memory for KIM-1s or KIM Clones running the xKIM Monitor
- Can provides floppy disk emulation for Flex on 6800 and 6809 SS-50 machines when paired with a suitable parallel card via the xSWTBUG or xSBUG monitor
- DS3231 RTC with battery backup (CR1220 battery not included)
- Fully documented parallel protocol that can easily be adapted to other platforms

Connecting the SD Card System

First insert a CR1220 battery into the battery holder. Using the included 2x13 ribbon cable connect the SD Card System to a RetroSpy KIM-1 I/O board or a RetroSpy/Corsham Technologies SS-30 Parallel card. The SD Card System can be powered via the ribbon cable or via USB. The SS-30 Parallel Card provides +8V while the KIM-1 I/O Board provides +12V (if the board has a +12V supply connected).

There are two buttons on the SD Card System. The one near the micro-USB port is the programming button and should rarely be needed. The other button is a reset button for the SD Card System. If the system ever starts misbehaving a reset will usually fix most problems.

The SD Card System has three LEDs that are under software control. This is the current meaning of each:

GREEN – turns on/off every second to indicate the main software loop is running.

AMBER – Turns on at the start of a command from the host, and turns off when the response has been sent. This is like the “activity light” on most disk drives. If you are modifying code or writing your own low-level functions, if the amber LED is on for long periods of time, it can indicate some software problems.

RED – Indicates a problem. Currently, this comes on when the SD card is removed and turns off when an SD is re-inserted.

Using the SD Card System

1. On a KIM-1

The SD Card System is mostly controlled via the xKIM monitor. The only exception is to set the RTC from a KIM-1 you need to load and execute SETCLOCK.HEX from the included SD card. This can be done from xKIM directly.

There is a known issue where if you hit 'C' (get date/time) in xKIM too rapidly xKIM can lock up. This doesn't seem to happen when running GETCLOCK.HEX, so there is a bug somewhere in xKIM that I need to hunt down.

2. On a SS-50 Machine

The SD Card System is supported via Corsham Techologies' xSWTBUG for 6800 machines and xSBUG for 6809 machines.

To boot FLEX on a 6800 machine:

1. Make sure SD.cfg has SD00BOOT.dsk configured to mount as drive 0
2. Set DIP switch 1 is OFF
3. Reset the SD Card System
4. Power on the machine and enter xSWTBUG
5. Use command 'B' to boot FLEX

To boot FLEX 09 on a 6809 machine:

1. Make sure SD2.cfg has SD09BOOT.dsk configured to mount as drive 0
2. Set DIP switch 1 is ON
3. Reset the SD Card System
4. Power on the machine and enter xSBUG
5. Use command 'B' to boot FLEX 09

3. New FLEX Commands

DATE

This is a standard utility but the one we include has been modified to get the current date and time from the SD card's real time clock (RTC). If you use the command line arguments to set the date, it will not affect the hardware real time clock. Use the SETCLOCK command to set the clock instead.

MOUNT

This is a new command we've added to help manage mounted drives. With this utility, you can see what files are mounted to which drives, unmounts DSK images, and mount DSK images. This basically just edits SD.cfg and SD2.cfg from FLEX.

NEWDISK

This command is used to create new DSK format files that can be mounted. The FLEX operating system handles different sized disks extremely well; a major improvement over other operating systems of the time! Each disk has a single sector that has information about the disk parameters, so the NEWDISK command allows the user to format a number of different sized disks and then write the appropriate information to the disk so FLEX can use it.

The default formats are:

- 88K (34 tracks, 10 sectors per track)
- 256K (32 tracks, 32 sectors per track)
- 500K (76 tracks, 26 sectors per track)
- 1.4M (79 tracks, 72 sectors per track)

SETCLOCK

This utility's sole purpose is to set the hardware real time clock. When executed, it will get the current time, date and day-of-week from the RTC display the values, and allows you to change the values. This is not used very often, usually when the system is first set up for a new time zone.

The hardware real time clock is a Dallas DS3231 which has a very stable time base, so it should drift very little over extended periods of time. Since FLEX only uses the date, this clock should be more than sufficient accuracy for most applications.

Note that FLEX only knows the current date and will not automatically query the RTC to get the current date. If you use the DATE command, then leave your system running overnight, FLEX won't know to update the current date unless you use the DATE command again. Every time I sit down in front of my system, I do a DATE command just to make sure the date is accurate.

Contact Us

If you have any problems do not hestiate to contact us for help.

support@retro-spy.com

https://retro-spy.com/contact-us/

retrospydisplay

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