



Sparkle is a trackmo loader solution for the Commodore 64 inspired by Lft's Spindle and Krill's loader. It utilizes full on-the-fly GCR processing, fast data transfer, and blockwise data compression. Demos are built using loader scripts and demo parts are loaded sequentially. Loader calls are parameterless. Sparkle handles multi-disk trackmos as well. A Win32 tool is provided to edit script files and build demo disks.

MAIN FEATURES

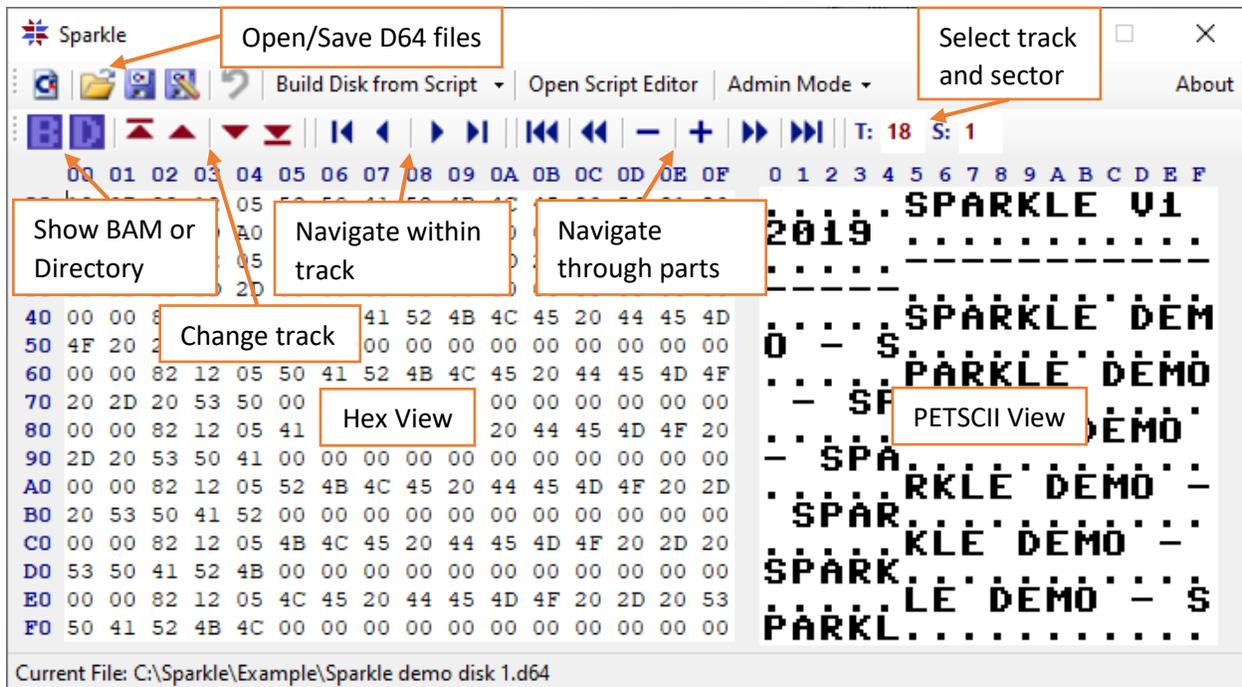
- Tested on 1541-II, 1571, and Ultimate-II+. Passed THCM's rigorous 24-hour test.
- Resident size: \$280 bytes including loader, depacker, fallback IRQ (\$0180-\$02ff), and buffer (\$0300-\$03ff). Stack is reduced to \$0100-017f. The buffer contains preloaded data between loader calls, so it needs to be left untouched. Zeropage locations \$02-\$03 are clobbered during loading. OK to use them between loader calls.
- 125-cycle on-the-fly GCR fetch-decode-verify loop tolerating disk rotation speeds of 289-311 rpm across all four speed zones, providing high stability.
- Very simple communication code with reset detection.
- 2Bit+ATN transfer protocol, 72 bytes/block transfer speed. Transfer is freely interruptible.
- Spartan Stepping™ for seamless data transfer across adjacent tracks with zero additional stepper delay.
- Sequential loading only. No random file access.
- Currently only handles 35-track disks.
- Built-in blockwise packer/depacker. The packer compresses demo parts back-to-back. Thus, no partially used blocks are left on the disk.
- Combined fixed-order and out-of-order loading.
- Bus lock. The loader uses \$dd00 for communication. The user can freely abuse \$dd02 between loader calls as long as \$dd00 is left untouched and \$dd02 is restored before the next loader call.
- Loading under I/O is supported.

SPARKLE WINDOWS TOOL

The Sparkle Windows tool (written in VB.NET, target .NET Framework 4.5, should work on Windows 7+) features a simple disk monitor and a built-in script editor. D64 and script files can be opened from within the tool or drag-and-dropped to process them. Script files use the .sls (Sparkle Loader Script) extension. Run Sparkle as administrator to associate the .sls file extension with the tool. Once the necessary registry entries are installed you can also build your demo disks by double clicking script files. (This can also be achieved by selecting Sparkle from the Open with... list after double clicking a script file.) Sparkle can also be used as a command line tool (e.g. sparkle mydemo.sls). A simple demo project is provided as an example.

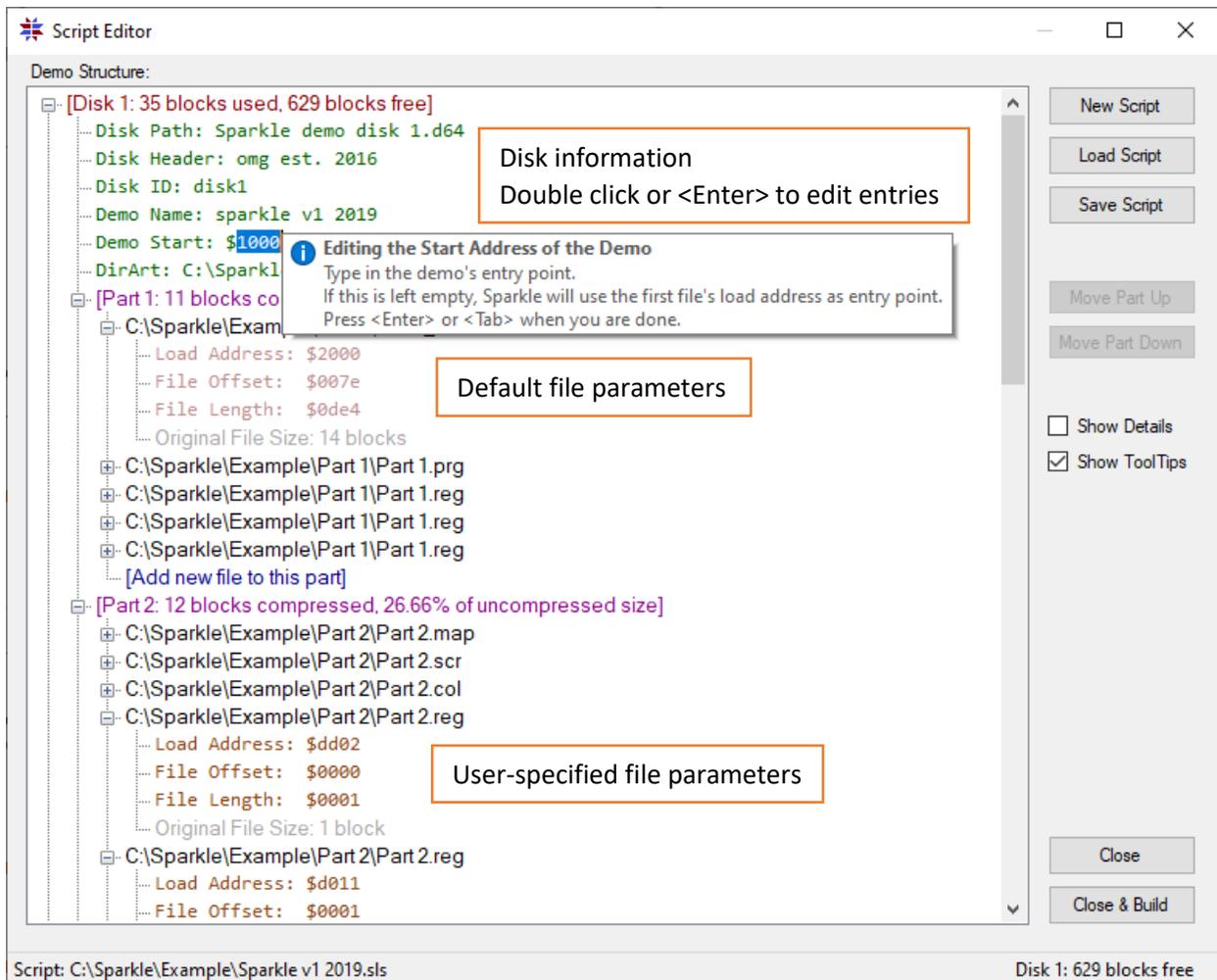
MAIN WINDOW

Sparkle features a simple disk monitor which is the main window of the program showing the hex and PETSCII views of the selected sector and two toolbars. Here you can start a new disk , open , and save  D64 files, and build demo disks from scripts. On the second toolbar, the leftmost two buttons will show the BAM  and the first sector of the directory . The next four buttons will navigate to the first , previous , next , and last  track on the disk. The following four buttons will load the first , previous , next , or last  sector of the selected track. The next group of six buttons are used to navigate through demo parts, jumping to the first sector of the first part , the first sector of the previous part , the previous sector in the part , the next sector in the part , the first sector of the next part , and the first sector of the last part . Finally, on the right side of the toolbar you can see the current or manually select the desired track **T: 18** and sector **S: 1**. Hovering over a button will show a tooltip with the description of the button's function. In the Hex View panel, you can perform changes in the selected sector.



SCRIPT EDITOR

Scripts can be created, loaded and saved in the script editor window where demo information is organized in a treeview structure. Opening the editor will prepopulate the treeview structure with a blank disk or with the previously opened script. Pressing the <Enter> key or double clicking on an item allows editing. Deleting a value will reset it to its default if such exists. Here you can specify where you want to save your demo disk, add a disk header and ID, enter the demo's title (first prg in the directory), the start address (entry point), and you can also add DirArt (16 characters in a row separated by line breaks, saved as a .txt file). Disks, parts, and files can be deleted using the <Delete> key. Demo parts can also be freely rearranged. Scripts can be saved with absolute file paths or relative to the script's path.



Instead of files, Sparkle works with demo parts. A demo part is the sum of arbitrary files and data segments designated to be loaded during a single loader call. (This may not literally correspond to an actual part in a demo which may require multiple loader calls.) When adding files to a demo part, you can specify what and where you want to load by editing the load address (where the data will go), offset (first byte of data in the file), and length of the desired data segment (number of bytes to be loaded) within the selected file. By default, Sparkle uses the first two bytes of the file as load address, 2 as offset, and (file length-2) as length. During disk building, Sparkle will only compress the selected segment of the file. If any part of a data segment falls overlaps the I/O area (\$d000-\$dfff) Sparkle will ask you to specify whether the file should be loaded to the I/O or to the RAM under the I/O. Sparkle sorts files within a part during compression to achieve the best possible compression ratio. Therefore, file order within a part can be random.

RUNTIME CONSIDERATIONS

The C64 resident code and the drive code take 8 blocks on track 18. Thus, you have the entire 664 blocks for your demo and the remaining 10 blocks of track 18 for DirArt. Loading and running any entry from the disk's directory will install the loader which then will automatically load and start the first demo part. The following functions are available:

- Loader call:

```
jsr $0180 //Parameterless
```

This parameterless subroutine call will load the next part as specified in the script. The loader writes #35 to \$01 at the beginning of every loader call and will return with this value in \$01. It does not clobber the I flag. When the loader is called, it first depacks the first partial block (if such exists) of the next part from the buffer before receiving the next block. During depacking I/O may be turned on or off depending on where the data are designated. Once the last part on a disk is loaded the loader moves the read/write head to track 18 and checks the last three bytes of the BAM to determine whether there is a next disk side to be loaded. In case of a multi-disk demo, the next (standard) loader call will instruct the loader to wait for disk flip before the next part is loaded. The loader will reset the drive if there are no more disks.

- Fallback IRQ Installer:

```
jsr $01e0 //X/A = IRQ subroutine vector Lo/Hi
```

Use it to install a simple fallback IRQ with a music player call or any other function. The IRQ routine is located at \$02de and the subroutine call initially points at an `rts` instruction. The low and high bytes of the subroutine address need to be in the X and A registers, respectively before the IRQ installer is called. Use `jsr $01e6` if you do not want to change the subroutine vector. The I flag is set during the initialization of the loader and remains set after loading the first part is completed. Calling the IRQ installer does not change the I flag allowing the user to set or clear it at the desired moment.

CAVEATS

VIC bank selection must be done by writing #3c-#3f to \$dd02. Do not change \$dd00.

Loading to pages 1-3 is not recommended as it would overwrite the loader or preloaded data in the buffer. While Sparkle can load files compressed by another packer such as Exomizer, make sure to restore the stack pointer and any other registers and zeropage values as required by the packer before you start your program. Restoring the stack pointer will result in overwriting Sparkle's resident code on the stack, so further loads will not be possible.

Start the Win32 tool from a local or removable drive as it does not seem to work properly from network drives.

DISCLAIMER

Sparkle is a free software and is provided “as is”. I am not a professional coder so use it at your own risk and expect bugs. I do not accept responsibility for any omissions, data loss or other damages. Please credit me in your production should you decide to use Sparkle. Feel free to contact me with any questions via PM on CSDB or by emailing to spartaofomgATgmailDOTcom.

Sparta/OMG 2019