



TRIANGULAR OS v1.02 for PET

Manual

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1. Introduction

TRIANGULAR OS is GUI (graphic user interface) operating system for 8-bit Commodore computers. This Manual pertains to TRIANGULAR OS v1.02 for Commodore PET equipped with 40 column display.

Package contains files:

- *TRIANGULAR OS v1.02 for PET Manual.pdf* – this manual
- *TRIANGULAR OS v1.02 PET.d64* – image of TRIANGULA OS system disk
- *purple.vpl* – custom purple color palette for WinVICE emulator

Goal of creating this system was to develop GUI for 8-bit Commodore computers with lowest amount of memory: that is Commodore PET with 4KB memory and VIC-20 with 5KB (as of now that version is not yet ready to release).

This software is written in Commodore BASIC language using WinVICE 3.1 PET emulator, and is designed to run on less than 3KB available for BASIC programs available in lowest 4KB version of Commodore PET and will run on any PET model with bigger amount of memory. Commodore BASIC (an interpreted language similar in JAVA or C# CLI) is default language used in 8-bit Commodore computers and functions as OS for them. So TRIANGULAR OS sits top of BASIC and KERNAL (Commodore's kernel). It is designed to support Basic 1.0 (V1 / Original ROM) or 2.0 (V2) and higher editions of Commodore BASIC. Additionally, TRIANGULAR OS works in text mode, since PET has not any graphic mode.

2. Changelog

What's new in TRIANGULAR OS v1.02 for PET:

- Minor visual changes across the board (mostly highlighted key letters)
- Launch program renamed to TRIANGULAR OS
- TRIANGULARS OS/BIOS – has improved disk drive detection system. Drive database expanded (include SD2PET (*experimental*)). Loads OS>CFG file with wallpaper settings. From BIOS Setup Menu option is added to exit to BASIC
- GUI OS – SETTINGS saves wallpaper settings in file OS>CFG.
- CMD – fixed drive # change mechanism. Minor bugfixes.
- OFFICE apps visual revision and many bugfixes
- GAMES minor visual changes and bugfixes

Changelog for TRIANGULAR OS v1.01 for PET:

- First version to have manual
- Various minor improvements done in launching TRIANGULAR program
- BIOS – fixed launching logo position
- GUI OS – memorize cursor position in-between loading modules plus minor bugfixes
- CMD – many bugfixes
- MONITOR – fixed serious bug preventing user from running machine language programs
- OFFICE – apps can now properly load and save data on disk
- STAR WARS – added music in intro and outro. Game engine now don't reset system clock
- SNAKES – AI opponent fixed and minor esthetic changes
- LUNAR LAND – received minor esthetic changes

3. Preparations

In order to run TRIANGULAR OS, You need real 40 column Commodore PET computer with 4 or more KB of RAM and disk drive or WinVICE emulator, which is available here for free: <https://vice-emu.sourceforge.io>

WinVICE should be configured as 40 column model. Disk drive that can read 170KB 5.25" (*.d64 file) diskette should be enabled (recommended CBM 2031). Any KERNAL ROM or memory size is supported by TRIANGULAR OS.

For purple color palette in WinVICE use custom pallet *purple.vpl* file included in this package, as external pallet. This custom pallet was created in PaletteEditor .11 program available here (if You want create You own custom color for PET): <https://www.lemon64.com/forum/viewtopic.php?t=53176>

4. How to use TRIANGULAR OS

To start using TRIANGULAR OS, you should load TRIANGULAR program from file disk named *TRIANGULAR OS v1.02 PET.d64* (included in this package) into your PET computer or emulator.

TRIANGULAR OS consists of 21 files which all take 43.16KB net or 185 blocks on disk (46.5KB disk space).

To load OS insert *TRIANGULAR OS v1.01 PET.d64* into disk drive and type command: **LOAD “*”,8** or **LOAD “TRIANGULAR OS”,8** in BASIC and press Return (or Enter key in emulators). If You are using Your drive device #8 use one of above commands. If You use another device # then change last number (8) to it (e.g. **LOAD “*”,9** if You want to use disk drive #9). After successful loading startup program type **RUN** (and press Return/Enter) to start TRIANGULAR OS.

That will start whole system. This program is first element of this OS, BIOS. It checks computer, running machine is indeed Commodore PET, which BASIC version is running it (V1 or V2 and higher), if this is 40 column version. Next it checks if there are disk drives, detects disks hardware IDs, and if system disk is present and automatically sets boot drive to lowest disk drive # containing matching system disk.

If any of above conditions are not meet BIOS will display error message and return to default BASIC mode. If everything went OK, launching screen will appear. By pressing DEL key, You can enter BIOS SETUP menu, where system parameters and list of detected disk drives will be presented. To change boot device hit key presented in-between <> brackets (A-D) after name of available disk drive. You can also change system time by hitting T key and entering new time in format HHMMSS or reset system clock by hitting R key.

To restart whole system hit E key. To quit this menu use Q key to go back to launch screen. When DEL key is not pressed, BIOS continues to launching GUI.

GUI (graphic user interface) is main element of TRIANGULAR OS. GUI is navigated by pressing number pad keys, which moves arrow-like cursor:

- 2 – down
- 4 – left
- 6 – right
- 8 – up
- 5 – select/click

On bottom of screen there is task bar with TRIANGULAR logo on center and clock on left. Clicking this logo will open menu where You can select:

- SETTINGS – opens setting window
- RESTART – restarts whole system
- SHUT DOWN – exit to BASIC

In SETTINGS window You can change system time (by clicking on + and – signs to change hours, minutes, seconds). Click on RESET CLOCK button resets system clock. By clicking on one of five tiles on right of PATTERN text You can change system wallpaper pattern. As in most GUI by clicking X button we close the windows.

On desktop there are 4 icons:

- THIS PC – open window similar to My computer or This PC on Windows
- OFFICE – opens window with selection of office suite programs
- GAMES – opens windows with games
- MONITOR – starts machine language monitor

THIS PC window contains 2 icons:

- 1/ which will load cassette tape program from main (#1) cassette tape player
- CMD which starts a DOS-like command prompt program

CMD is command prompt DOS-like program that allows You to manage disk content. It accepts one of following commands (1 space between command and *filename*, which must be 1-16 characters long):

- HELP - shows help
- CLR - clears screen
- EXIT - go back to desktop
- RESTART - restarts computer
- INFO - displays info about computer and current disk drive
- + <*filename*> - load program
- DEL < *filename* > - deletes file
- RENAME < *filename* > - renames file
- COPY < *filename* > - copies file
- FORMAT - formats disk: input disk name (1-16 characters) and ID (2 characters)
- INIT – initialize disk
- VALID – validates disk
- 1/ - load program from cassette tape #1
- 2/ - load program from cassette tape #2
- <*disk device # (8-11)*>/0 – change device # that CMD will work on e.g.: 8/0 or 9/0

MONITOR is program that show computer memory content and can change it. Memory is displayed in hexadecimal number system (0-F). Possible commands below (type X in any further prompts to cancel operation):

- HELP - shows help
- CLR - clears screen
- EXIT - go back to desktop
- ENTRY – change memory from given memory address, one byte after one byte (additionally besides X, You can type R to repeat previous value)
- SHOW – shows memory content starting from given memory address
- FILL – fills specified memory region with given byte value
- COPY – copies specified memory region to another
- GO – starts machine language program

OFFICE folder contains of 4 office suite programs:

- WORD – word processor. Enable main menu by pressing Shift + Return/Enter. Press < or > to slide through main menu options.
- CALC – very simple spreadsheet program. Press < or > to slide through main menu options. Press 1 to 7 to enter values to that spreadsheet row.
- CONTACTS – create and manage contact information's.
- MATH – scientific calculator. To add 2 numbers, enter 1st number (by pressing Return/Enter key) and press + sign. Next similarly add 2nd number and press + sign. Result is showed on right from RESULT label (near top of screen). Other mathematical functions operate similarly.

GAMES folder offers 4 game titles (instructions inside every game):

- STAR WARS X-Wing vs TIE Fighter – fabulous Star Wars themed space shooter
- LUNAR LAND – Lunar lander simulator
- SNAKES – play game of snakes with second human player or computer opponent
- BREAKOUT – superb PET edition of this famous game.