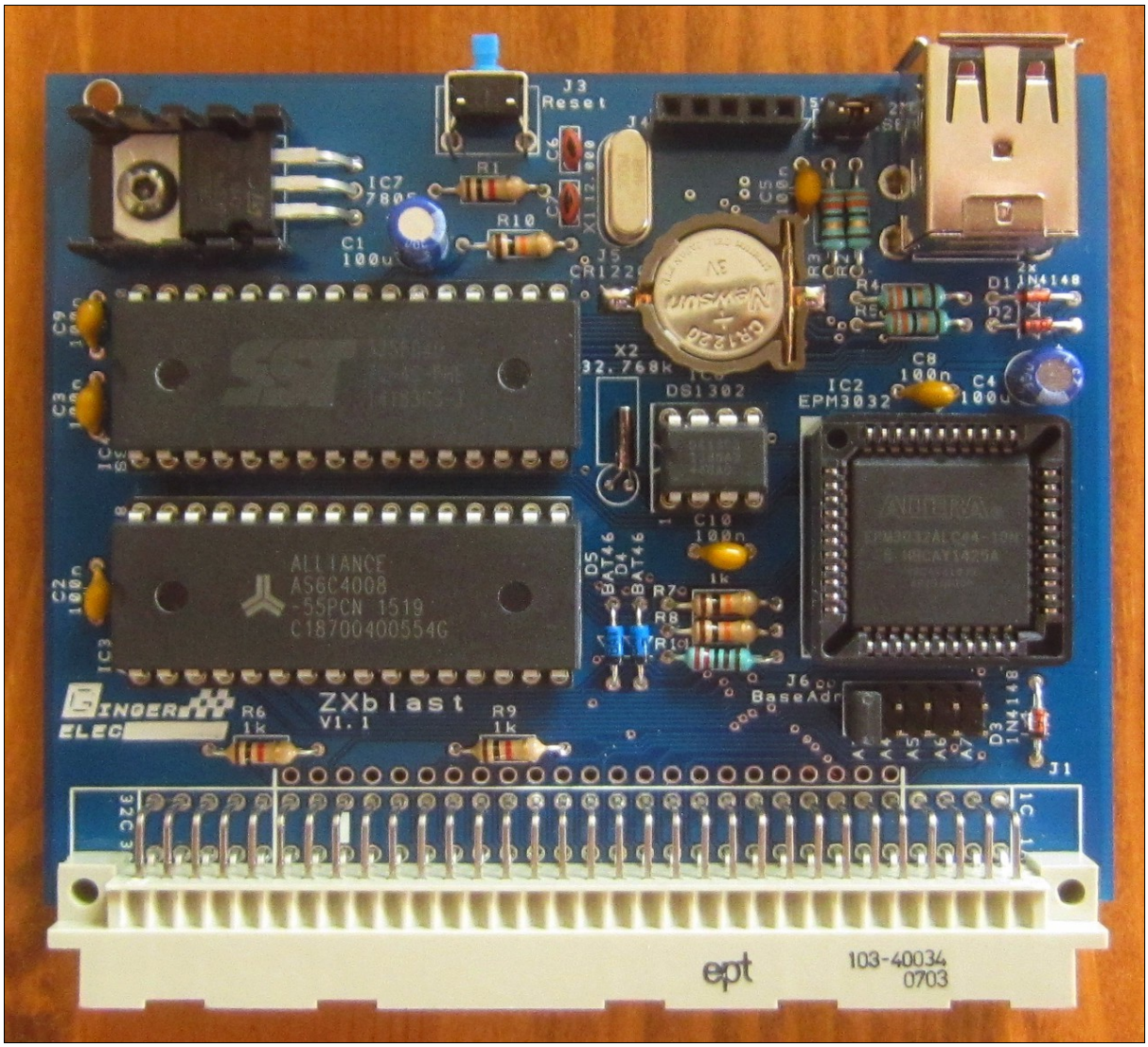
ZXblast

User manual



Contents

Short description

ZXblast is a memory expansion and a USB mass storage interface for the ZX81 and compatible computers for loading and storing programs and data. It offers 128k or 512k RAM depending on version and is configurable to enable and disable several memory areas to achieve a maximum of 56k RAM while the first 8k is used for the ZX81 rom.

ZXblast offers additionally 128k or 512k flash rom for loading different/modified ZX81 compatible ROMs or combined with additional and/or different drivers. The 512k version allows also to start up to 7 different programs concurrently while only the active or visible is executed and the others are in halted state. It is possible to switch between the programs (called instances) with simple keystrokes.

An additional feature is to activate paging with pagesize of 8k or 16k RAM with page window anywhere in memory. This is mainly a developer feature as there was never a standard for paging or ram banking and programs using this feature are hard to find at all.

The 128k version allows to start one instance only but with up to 56k RAM and allows to choose between a custom ROM with additional drivers or the original internal ZX81 rom.

ZXblast has two USB ports. One is used for flash media sticks to load and store programs or data and a second one for connecting other USB hardware like joysticks, keyboards, or similar. This is a feature to be used in future. ZXblast has additionally a battery backuped real time clock (RTC) to provide a correct time stamp when saving programs or datafiles. It takes it's power from an own voltage regulator from the 9V of the ZX81 to avoid additional heat to the internals of the ZX81.

The 128k or 512k flash ROM can be programmed with the ZXblast itself and some internal tools. ZXblast is full compatible to HRG (high resolution graphics by software) and allows execution of machine code (assembly) in the memory region above 32k but below 48k (called M1NOT mod).

Technical data/specification

Flash ROM	128k or 512k
RAM	128k or 512k
USB	2 Ports
I/O address bit used	A3 (optional A4,A5,A6 or A7)
Power Supply	9V over expansion port 45 mA for ZXblast only (plus USB devices used)
Memory configurations	16k, 24k, 32k, 40k, 48k, 56k RAM
Extras	RTC (real time clock) paging/banking up to 448kByte with 8k or 16k window anywhere in memory
Features	HRG high resolution graphics from memory M1NOT (program execution >32k and <48k RAM)

Restrictions on 128k version

The 128k version allows to start one ZX81 session only (single instance) and basic memory configuration (48k/56k) but with all USB features. Paging/banking is not available for the 128k version but this is useful for developers only as it requires programming skills. The 128k version can use either the internal ZX81 rom or a custom rom flashed into ROM.

Getting started

The ZXblast can be easy attached to the expansion port with the extender board to original ZX81 systems.

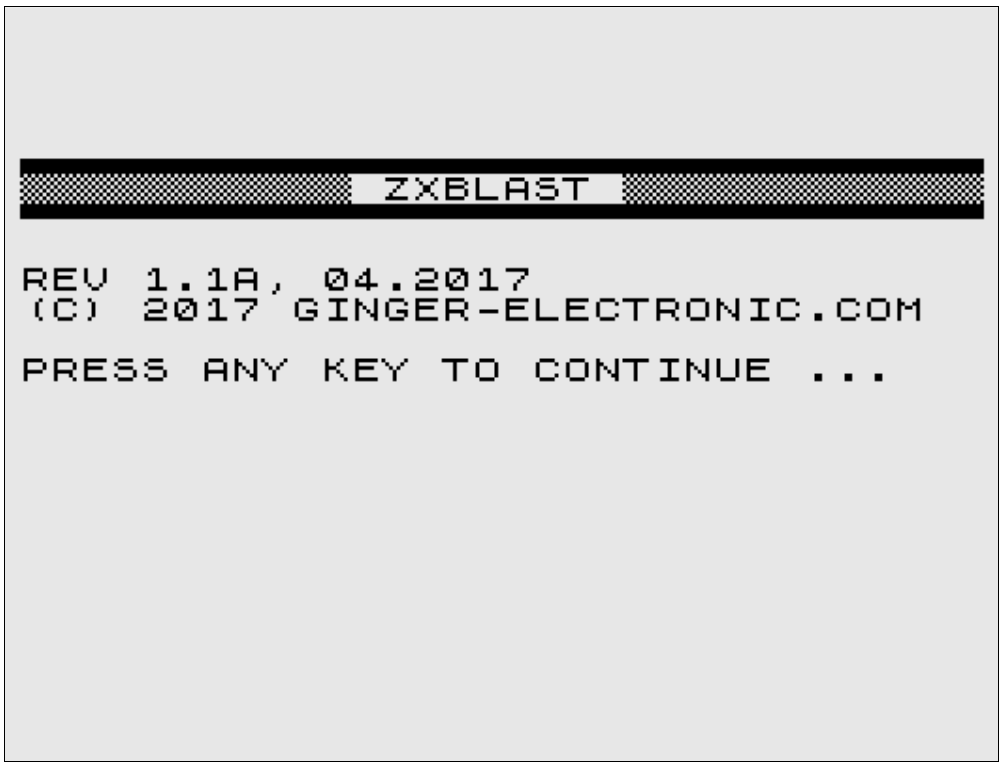
Please remove power always before attaching or removing this module (!).

Please be careful when plugging it into the expansion port with not too much force and slowly and respect the keyway on ZXblast and ZX81. It should fit easy and with reliable contact. Be sure there is no wobble when slightly touching the ZXblast. Too bad if programs will crash during accidently touched with no good electrical contact.

Be sure, that the base address (J6) is jumpered to A3. This can be changed with the ZXblast update utility only in case of i/o address conflicts.

Welcome screen

When attaching power the welcome screen is shown instead of the standard ZX81 cursor.



The welcome screen prints the software release and date and can be skipped by pressing any key. Pressing **L** will try to restore a previous system backup, see section „backup & restore" for more details.

The welcome screen can be forced by pressing double shift **R** in configuration screen or by pressing the reset button while holding the shift key or alternatively power-up the system by pressing the shift key. See more details in section „reset".

Whenever the ZXblast is not working after power-up or reset it is recommended to hold the shift key during power-up or during reset for a complete reset (cold start) while the reset button tries a partly reset only (warm start).

ZXblast basics and concept

ZXblast controls a ZX81 while switching the internal /ROMCS signal and starts with its own firmware instead of the standard ZX81 basic rom. The internal RAM is switched off totally and the RAM of ZXblast is used instead. It is possible to configure RAM and ROM configuration depending on user request with up to 56k RAM if desired.

The 512k flash rom and 512k ram is divided into 8 instances while the first 64k ROM and RAM is used for ZXblast control functions (instance 0). The rest of ROM and RAM is used for up to 7 instances. There is a full overlap of ROM and RAM while the configuration defines the usage of ROM or RAM in several address areas. This allows to start up to 7 programs or sessions in parallel while only the active instance/session is executed and the other halted. The user can switch from one instance to another instance (session) with a simple key combination.

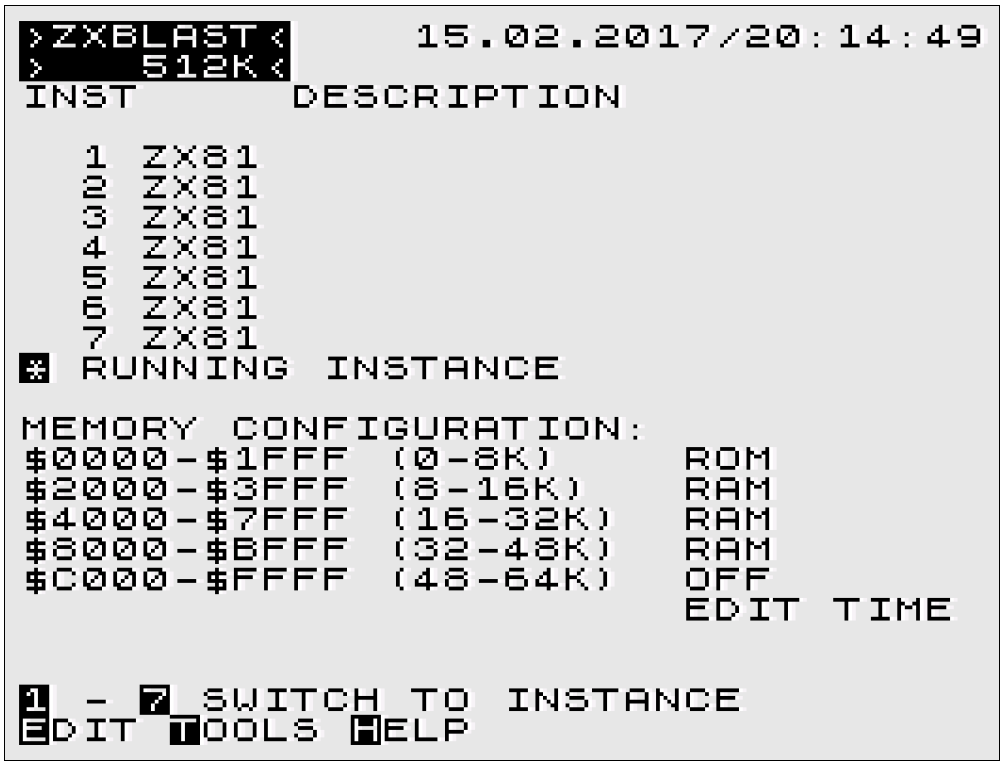
Double-shift key

To use ZXblast functions from a ZX81 session a special key combination is used, called double-shift key. For a double-shift key function the shift key has to be pressed twice consecutively, followed by a third key. To load a program from a ZX81 using the ZXblast USB port the double-shift **L** is used. The shift key has to be pressed twice, followed by the letter L. The pause between this key combination must not exceed one second otherwise the double shift function is aborted.

This key combination allows control of ZXblast functions from any ZX81 session without harming programs. The double shift is not used and ignored from the internal keyboard driver. Functions in ZXblast configuration tool (instance 0) can be used without double shift, this feature is reserved for controlling functions from ZX81 session only.

Config screen

After pressing „any key" the config screen is shown with several data fields to see which instances are started, which programs are loaded and how the memory is configured. The picture below shows the config screen after system startup. The config screen shows the memory configuration, running ZX81 instances (sessions) and the last loaded program in the field description.



Starting a ZX81 session

A ZX81 session is started in a specific instance (1-7) with pressing directly the digit **1-7** in the ZXblast config screen or alternatively using the double-shift combination with **1-7**. The double shift **1-7** can be used for direct switch from one session to another. If a session is not started yet it will be started automatically with doing the internal RAM test and showing the typical BASIC input cursor „K".

The ZX81 session can be used normally while the ZXblast session is always listening in the background for double-shift key combinations to request several ZXblast functions like loading or saving a program. The return to ZXblast config screen can be done with double-shift **0**.

Loading a program

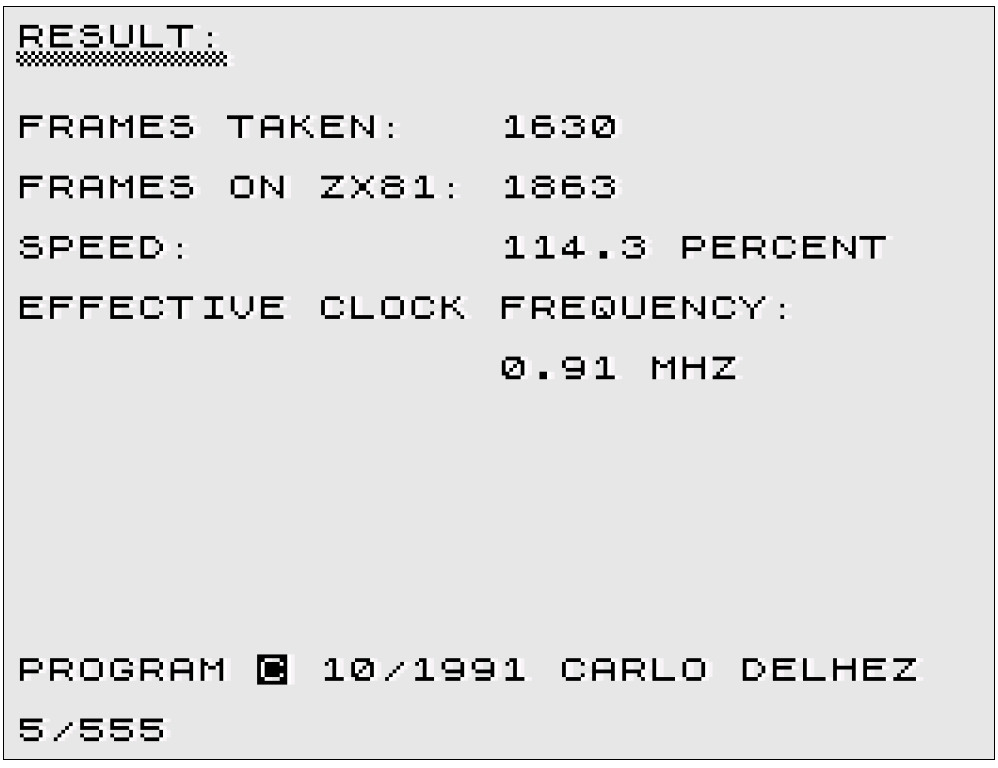
A program is loaded with double-shift **L** from the ZX81 session. It switches automatically temporarily to ZXblast instance, start the loader tool and request the user to enter the program file to be loaded. After loading the program file the ZXblast switches back to the specific session and starts the program if it was saved with autostart option (ZX81 BASIC feature).

Otherwise the loaded program has to be run with RUN from the command line. Be aware that RUN clears all variables so there are programs which should be started with GOTO 0 instead. This is depending on the program.

The loader offers additional features which are described in a special section in the manual in more detail. The next picture shows how the program CLCKFREQ.P is loaded into a ZX81 session.

Be sure that the USB flash media is inserted in the upper USB port as the lower port is used for peripherals only. If the flash media is not present or file not found a corresponding error message is shown.

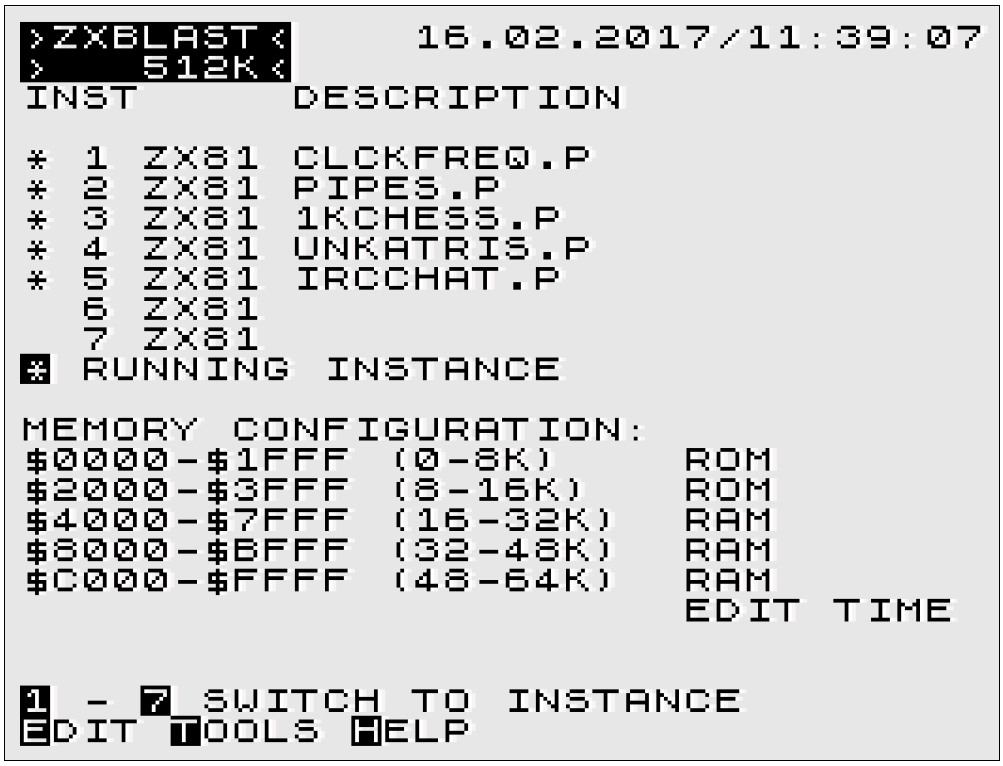
After entering the filename and loading the program the ZXblast switches back to the ZX81 session and executes the program loaded to memory before.



Saving a program is done in the same way by pressing double-shift **S** instead and entering the filename to be used to save.

Configuration tool

The config tool can be reached any time with **DS-0** or pressing any key after power-up. This screen gives information about system status and settings and allow to change settings as well. In the upper left corner the used version is displayed – either 512k or 128k for the smaller version of ZXblast. In the right corner the date and time is displayed and below the available instances and if they are started already (marked with *) and the last loaded program.



Changing memory configuration

The memory configuration can be changed easily with pressing **E** (for edit) and a cursor is displayed to the adress area and can be moved with key up (**7**) and key down (**6**). The value of the cursor can be changed with **C** (change) and toggles through available values.

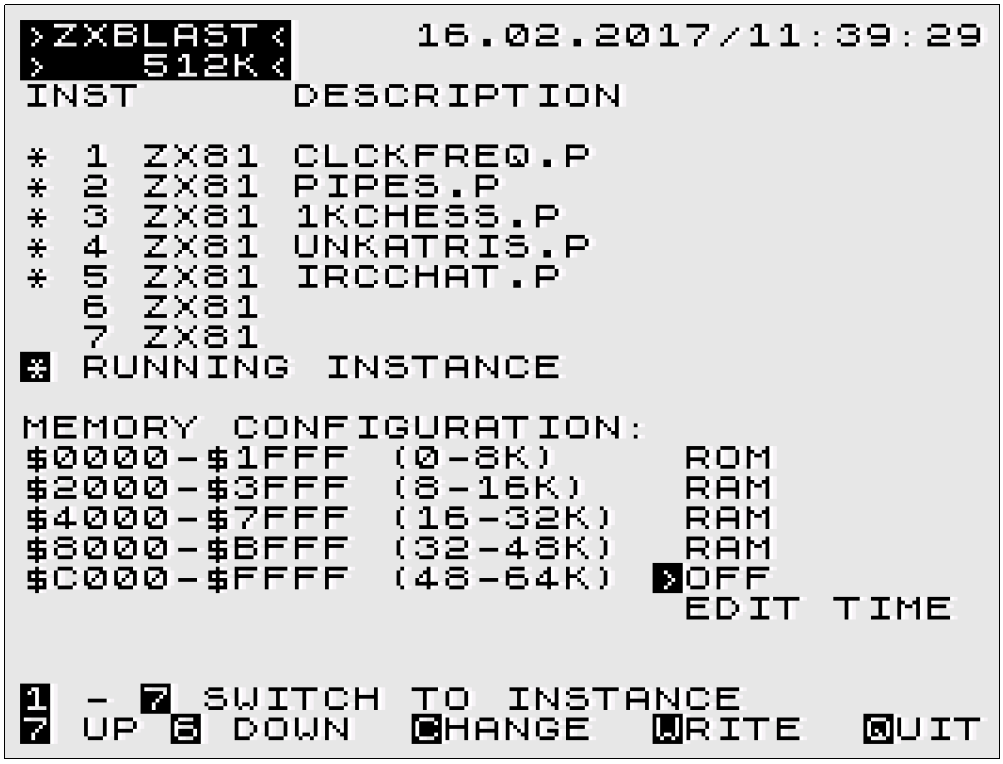
In the memory configuration ROM means flash rom is activated or RAM can be activated as well. There is a third option OFF available to leave a memory area free of use which may be used from additional interfaces or modules attached to the expansion port.

The memory configuration can be stored for next power-up while pressing **W** (write) which stores this information onto a special area in ZXblast flash rom. The memory configuration affects all instances or sessions, it can not be set individually for specific sessions.

Mostly additional 8k RAM is expected from some programs or games in the area $2000-$3FFF but it is also possible to program additional drivers here into the flash rom to be used. After startup a ZX81 session the memory is detected between 16k and 32k and not above 32k.
To use more memory it is recommended to execute following sequence after starting ZX81:

```
POKE 16389,255
POKE 16388,255
NEW
```

Due to hardware restrictions of ZX81 the area above 48k can be used for data and BASIC stuff only. This area is typically used for HRG (high resolution graphics data) as well. Machine code (assembly programs) will usually crash the system as the video display is active in this area. The area between 32k and 48k can be used for additional drivers in machine code/assembly as ZXblast offers the M1NOT modification.



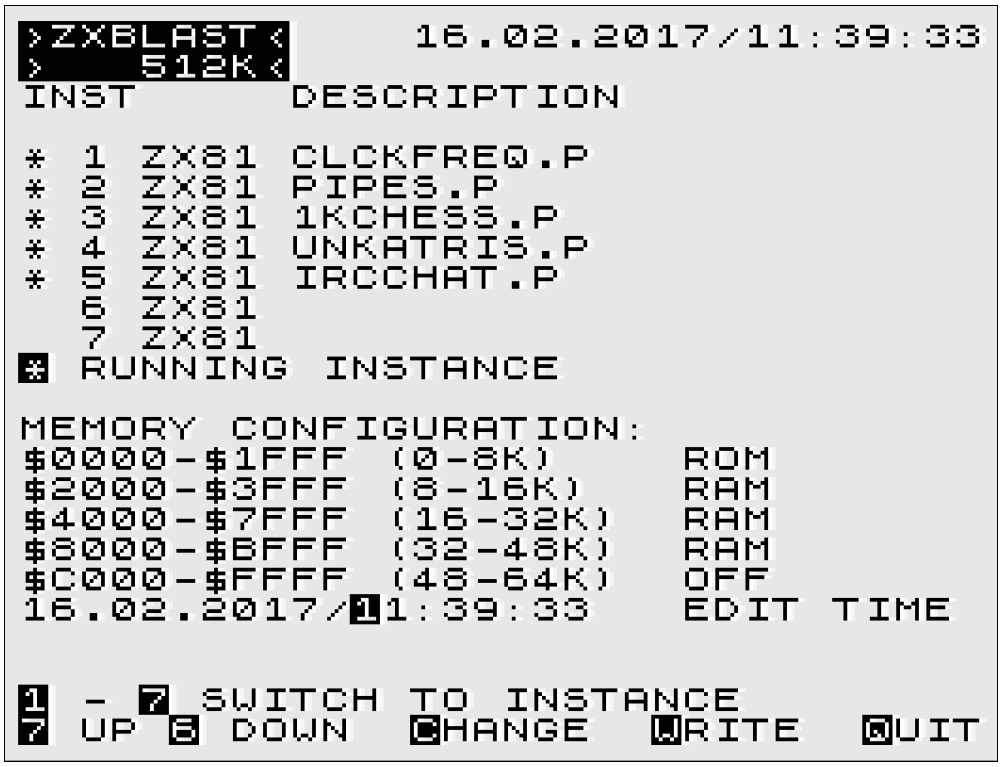
Setting date and time

When the ZXblast is build up by yourself from the construction kit it is necessary to set date and time first. But there may also time settings be necessary as the inbuild real time clock (RTC) is running from battery when powered off but not highly accurate. Typical a difference from one second a day could be expected to the offical date/time.

Setting is done in the config screen with pressing **E** for edit, moving the cursor down to EDIT TIME and pressing **C** for change. Now the date and time is displayed with a cursor and can be entered. There is a simple validation routine which detects nonsense data but it is recommended to enter a valid date/time.

If the time need to be corrected only you may press just NEWLINE for every digit which moves the cursor one position to the right and leave the content untouched for example to just set minutes and seconds. When pressing the last digit the date/time is automatically saved and the edit tool closed. So for a precise time it is recommended to enter the time a few seconds in future and press the last digit or NEWLINE while watching the clock and waiting for a manual sync with the keyboard.

No problem if you missed the wrong time or entered nonsense data – this step can be repeated as often as desired.



Whenever problems occur with the RTC chip like wrong date and time or wrong configuration data from memory configuration the RTC can be completely resetted with removing it's small battery of type CR1220 while power off.

After waiting a minute, put the battery back and switch on again, the RTC chip is in reset condition and has to be initialized with correct date and time. It is halted after removing the battery showing 00:00:80 as time. 80 seconds means, the battery was removed or seem to be bad after years of use and stays stopped until new date and time ist entered.

To restore the memory configuration, change like it is desired and just quit with **Q** and it will automatically saved in the RTC memory.

Filemanager

There are two ways to load or save programs or data files. One method is to enter those names directly via the keyboard, the other one is to use the internal filemanager to show a list of files, allow moving to directories and pick a file with the cursor.

First, the manual method is described here, which may be fast if you know the name already and USB flash disk is quite full and need time to navigate through it's content.

All file and directory names must follow the 8+3 rule with 8 chars for the filename and 3 chars for the file extension. Directories may use 11 chars all in all without extension (no dot). LFN (long filenames) are not supported.

Loading a program manually

The loader can be called directly from the opened instance (1-7) while just pressing **DS-L** (double shift and **L** for load) and the filename can simply be entered with the keyboard and pressing NEWLINE.

The program will be loaded into that instance, initialized and control is given back to the instance. If the program is of type autostart, it will be automatically started.

Saving a program manually

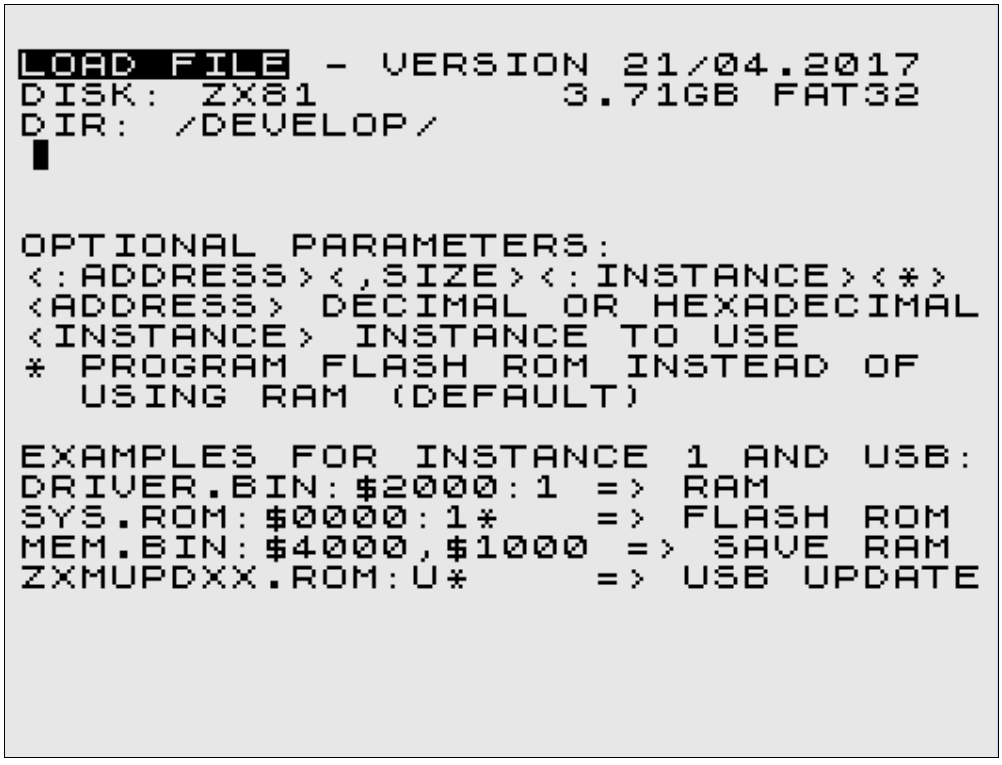
Saving a modified or new created program is as simply as loading with just entering DS-S instead of DS-L. The control is automatically given back to the instance as soon as the file was stored onto the USB flash disk.

To prevent accidently overwritten originally files, a prompt is given to either confirm the overwrite action or allow to modify the filename first to a new file.

Subdirectory support

There are two ways to work with files in subdirectories depending on personal favourites. It is possible to simply change in a subdirectory and navigate into the directory(s) which persists internally for further file access.

Example:
Just enter **DEVELOP/** to move to the DEVELOP subdirectory instead of a filename.



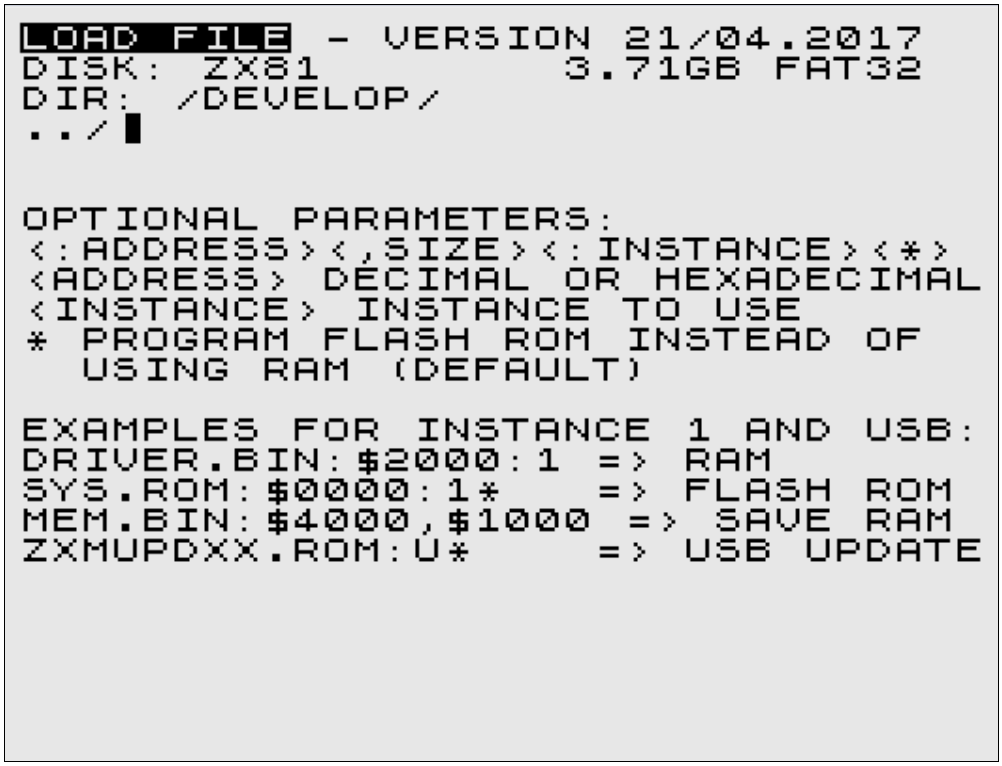
It is on the other hand possible to just load a filename from a subdirectory without changing the directory for further access when a filename is entered together with a subdirectory:

DEVELOP/NEWPROG.P

Subdirectories can be used in any deepness with or without a filename:

GAMES/CLASSIC/PACMAN.P

Subdirectories can be move upwards with using the typical DOS directory name **../** like shown in the picture below:



It is additionally allowed to use any combination of moving into subdirectory plus using relative and absolute path and filenames. Here is a list what you may do:

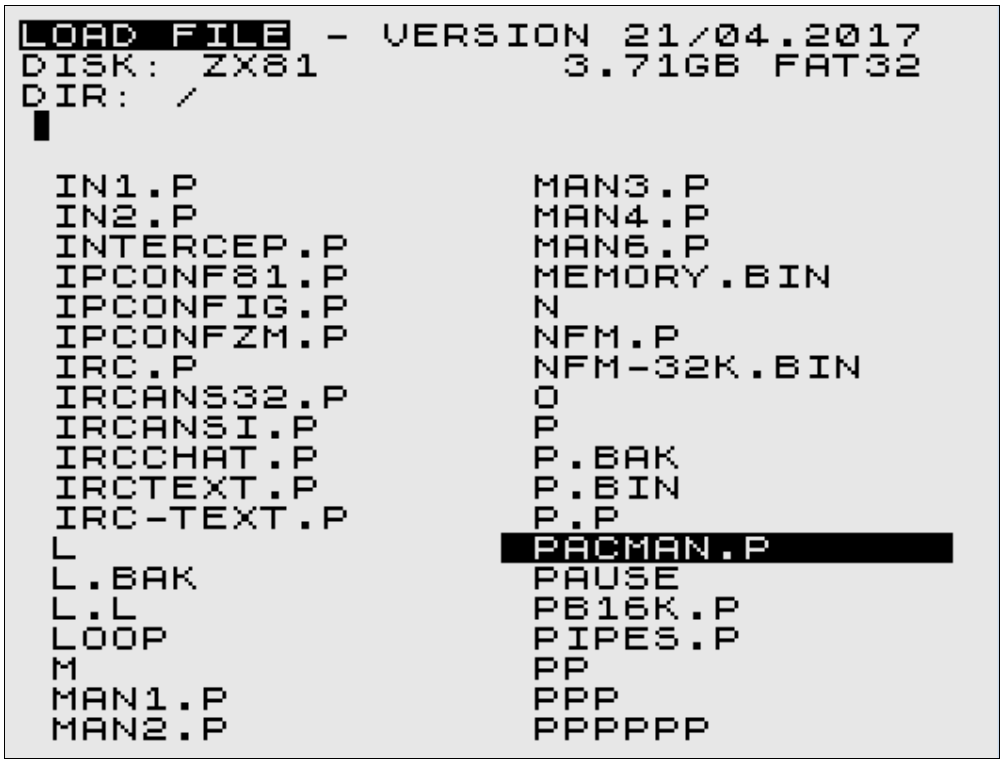
EDITOR.P
/FAVGAME.P
/GAMES/HIRES/REBOUND.P
../DEVELOP/EDITOR.P
../../DEBUG.P

The favourite directory to use is stored internally in memory and works even when the flash disk is temporarily removed and attached back for copying additional files on it from a PC or view an output with a debugger or similar. Anyway, to set the directory defined to back to it's root just use **/** to set the root directory.

In case there was a communication error with the USB flash disk due to aborted loadings you may try to enter **//** as filename to remove any waiting data on the internal queue or (if this doesn't help) just remove the power for a new startup of both, ZXblast and USB flash disk.

Getting a directory list

From Release 1.1 on you can get the directory contents as a list on screen with just hitting NEWLINE button with empty filename.



You can navigate through the directory list with just using **SHIFT-8** as pagewise forward or **SHIFT-5** for pagewise backward while **SHIFT-7** and **SHIFT-6** move the cursor (black marked filename) up and down.

Hitting **NEWLINE** writes the marked filename into the enter line and does not load it immediately but allows the user to enter additional parameters like any memory address.

The filemanager can also be used to preload an existing filename into the enter line and just modify the last character for example to save it under a new name.

Sort order of files

Files are shown unsorted in the order they are written to the disk in the current release 1.1. It is possible to order files alphabetically (or other desired order criterias) when copying these and additional subdirectories in an empty directory of a PC, sort them in the order you want and formatting the flash disk and copy the files than back.

Anyway, new created files are added at the end of the directory always. To have a better overview of own created files it is recommended to work with subdirectories.

Moving in subdirectories

Subdirectories are marked with **<>** in the files list and can be simply choosen with the pick cursor and NEWLINE like any file. The current directory is automatically changed and the contents of the new directory displayed. **<..>** is always the upper directory if the current directory is not the root.

Example of moving into the **<GAMES>** directory:

Disk information

In the upper line of the loader utility it is displayed if the performed action is either **LOAD** or **SAVE** and the current release and date of the USB firmware. Additionally the disk information is displayed as the label name of the disk, the total size and the FAT type. Only FAT16 and FAT32 are supported.

The size of the disk shows only the total size not the available free space. This would take a significant amount of time to determine (up to 30, 60 or more seconds depending on the disk) and can be a feature of future releases.

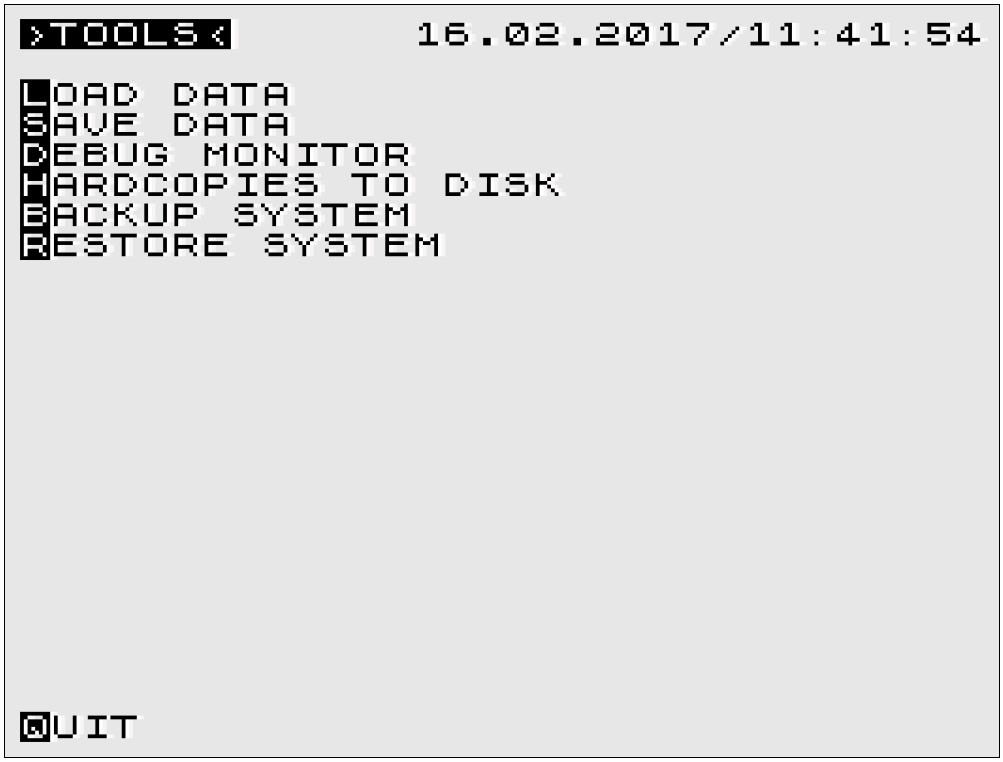
Only the upper usb slot is used for the flash disk at the moment, the usb slot near to the pcb is reserved for additional peripherals like joysticks which may be supported in future releases.

The loader offers more options with loading data to or saving from other memory areas, write data or drivers to the flash memory to keep them even during power-off and updating the USB firmware and more additional information on parametes allowed.

Please refer to the **TOOLS** section in this manual.

Tools Menu

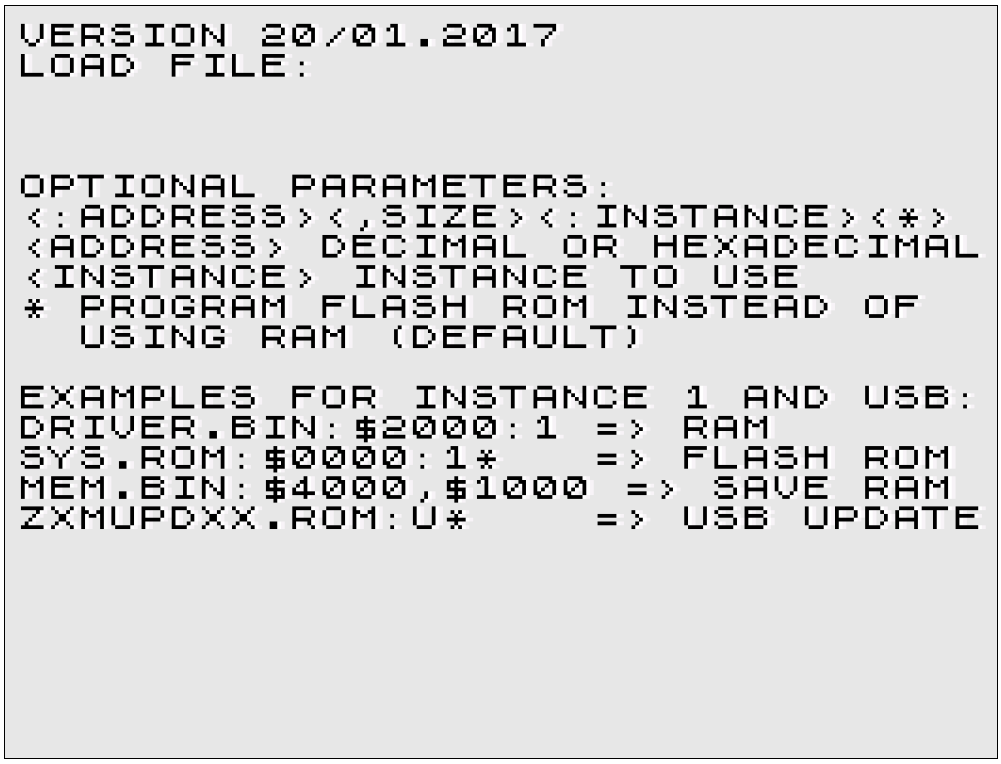
There are different tools provided with ZXblast to control the system in more detail, programming flash rom, watching RAM contents and different things more. All are available in the tools menu which is available while pressing **T** in the config screen of ZXblast instance.



Loading

Usually loading data is called directly from an instance (ZX81 session) with pressing **DS-L** which switches temporarily to ZXblast instance 0, access the loader, loads a entered program while reading it from USB flash disk and write it into memory from location $4009 and setting the system up in the same way the LOAD basic command does. The basic LOAD routine is not hooked in any way, it is a parallel way to load programs, the audio LOAD function via EAR (tape) is still exisiting and working.

When the loader is called from an ZX81 instance it's context is saved (instance number) and automatically loaded at the desired address ($4009) into memory and system setup. If the loader is called from the tools menu the desired instance and address have to be setup manually by user with additional parameters. This is more complicate but more powerful on the other hand also. If several loading steps have to be done manually to setup the session correctly it can be saved after preparing with the backup mechanism later (see section backup & restore).



To execute a load command first the filename has to be entered. All filenames have to be in 8.3 format with 8 letters/digits for the filename and followed by 3 letters/digits for the extension. LFN (long filenames) are not supported by ZXblast firmware. If you copy programs with long filenames to a USB flash media the filename may have to be shortened first to be found from ZXblast. ZXblast supports USB flash media with FAT16 or FAT32 only, FAT32 is recommended.

Special characters may be used as well as long as they are valid for a 8.3 filename.

Allowed chars in filenames are:
A-Z, 0-9, ! # $ % & ' ( ) - @ _ ` { } ~

A typical program has the extension .P like ZX81DEMO.p – anyway all extensions may be used for load and save with one exception .BAK this is used for complete instance backups, see section backup & restore for more details. The extension can be used freely but it is recommended to use .P to mark it as an executable ZX81 program.

Different parameters like address and instance are separated with a double colon. Most functions can be called from either instance 0 using foreign instance as target or directly from one instance and specifying a target address.

Loading a program

If just a filename with extension .p is entered from a ZX81 instance then the program is automatically loaded to address $4009 with it's full size and the system is prepared to start the program and pointers/system variables are set correctly to execute this program.

ZX81DEMO.P

If the program was stored with AUTOSTART option it will be automatically started, otherwise has to be started manually. If you start it manually with RUN all eventually stored variables will be cleared/destroyed. If a program is not running correctly this way you may try to start it with GOTO 0 instead.

Loading data into memory

To load just a datablock into memory there is a parameter address and optional size needed. This parameter is separated with double colon to the filename and the size is separated with colon. If no size is specified the file will be loaded with its full size.

ZX81DATA.BIN:$8000
ZX81DATA.BIN:$8000,$300

or using decimal numbers and specifying instance 2

ZX81DATA.BIN:32768:2
ZX81DATA.BIN:32768,768:2

Loading data into flash rom

All data is loaded into RAM by default. If you want to program a driver into the flash rom, for example to address $2000 / 8192 directly after the ROM you use following syntax:

DRIVER.BIN:$2000:1*

This will load an additional driver into the flash rom of instance 1 to the specified address and this is stored permanently in the flash rom until it is overwritten manually. The asterisk at the end specifies to use flash rom instead of ram.

Using a different/compatible ZX81 rom

By default the ZXblast instances are programmed with the standard ZX81 rom or lets better say it's open source variant open81.rom. To use a compatible but different rom or an own modified rom it can be simply flashed to address 0.

SYS.ROM:0:1*

Clear USB interface

If the system crashes for any reason, there maybe data waiting at the USB port which is not completely read and could confuse further USB communication. You could very this with the version info string, displayed in the first line. It states the release (here 20 for 2.0) and the date like 01.2017 for january 2017.

If the version info string is corrupted, there is likely some data waiting to be read first. To solve this situation it is possible to just enter NEWLINE with an empty filename which reads up waiting data and returns to the caller. Try again to LOAD or SAVE and the version string should be displayed correctly. You could also power-off the ZX81 for a few seconds. Try to power-on with pressed shift key for a full reset in that case.

Saving a program

This is comparable to loading a program, it is just initiated with **DS-S** for SAVE from a running instance. The simpliest way is to enter just a filename and use **.P** extension for complete programs (but this is just a convention). Avoid using extension .BAK as this is used for backup of complete instance, see backup & restore section for more details.

Saving a datablock

It is also possible to save just a datablock and to specify the start address and the size of the block like shown in following example:

MEMORY.DAT:$8000,$1000

This will save a 4kB data block ($1000) from address $8000 beginning.

Updating USB driver

It is possible to update the internal USB driver which is referred in the first line of LOAD or SAVE like

20/01.2017

This means release 2.0 with creation date of 01.2017 is installed currently. This can be updated while copying a new driver to the USB flash media and use the update command like shown below. This command can be issued only from instance 0 over the TOOLS menu with LOAD option.

ZXMUPD21.ROM:U*

Caution: As this is a critical step please follow these safety rules first.

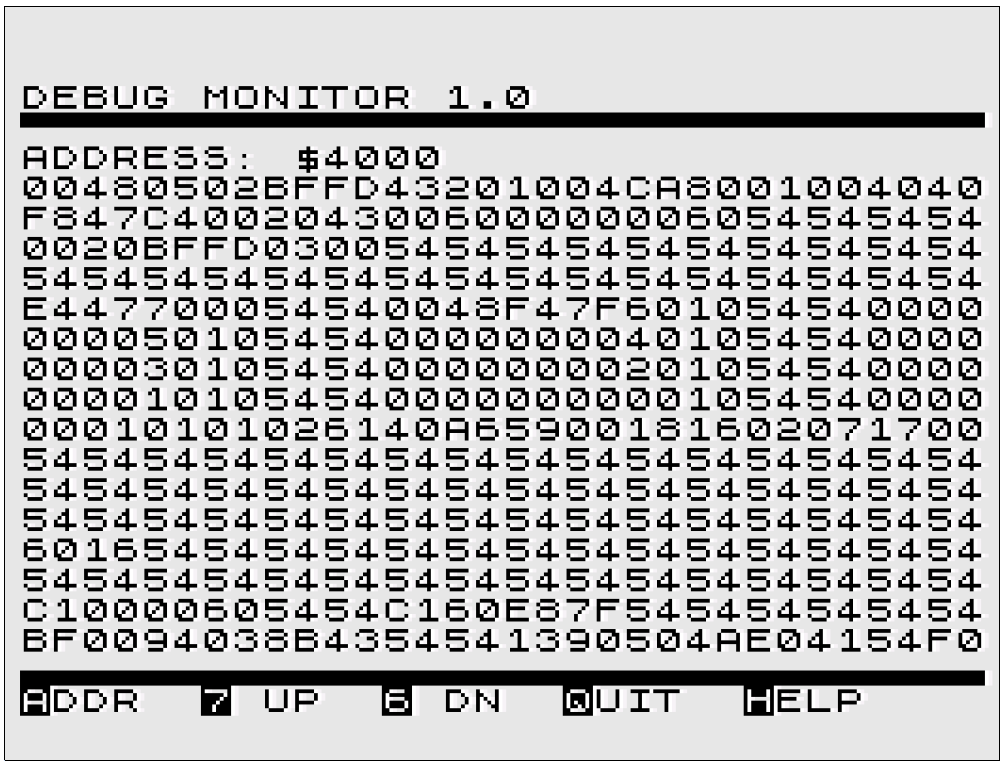
The USB firmware update file must not be fragmented onto the disks filesystem. To assure this, please do a defragmentation of the USB flash disk on a WIN PC with properties, tools, defragmentation in the file browser. Alternatively you can copy the contents of the disk into a directory on you harddisk including the ZXMUPDxx.ROM file, format the USB flash disk with quick format and copy then the directory contents back which was previously saved on your disk. This is also an easy to get an alphabetic sort order of the files on the flash disk.

1. Make a complete restart of ZXblast (power-on) and do not start ZX81 sessions
2. Be sure that the hardware is running safely and no wobble effect (all connections are properly)
3. The message „Try to update USB" will appear and after it will go back to the config screen
4. **Wait at least 30 seconds** to let the update utility do it's internal work
5. Power-off the system after this time and check the new version string when accessing the loader again over the TOOLS menu.

Debug functions

Debug monitor

There is an internal debug monitor available in the tools menu to inspect memory areas. The debug monitor allows display of memory contents only in this version, modifying is not supported by now. All data is displayed hexadecimal (256 bytes per screen) and can be paged forward and backward using the keys **6** and **7**.



A new address can be specified by pressing **A** and entering the new address either decimal or hexadecimal with a preceeding **$** sign.
By default the RAM contents of ZXblast instance 0 is shown. This can be changed with key **I** for specifying a new instance (**1-7**). It is normal that paging down or up results in flickering of the display as it is necessary to stop the video output shortly.

Inspecting memory contents is mainly a developer function only which might not be useful for normal users.

Hardcopies and screenshots

This is an experimental feature and helped to write this documentation. Up to 15 screenshots or hardcopies can be taken with DS-H and stored in memory of instance 0. Calling the function HARDCOPIES TO DISK will create a ZX81 program with a minimal text viewer and all screenshots made in memory.

It's main purpose is to be copied onto a computer, loaded into an emulator and make a hardcopy of the screen to be processed further. There might be more convenient features like directly generated BMPs in future and support graphics (HRG, high resolution graphics) as well.

For using this feature a framework is needed called ZX81HCOP.DAT and has to be copied to the USB flash media. The hardcopy file can be stored with any name, probably .P extension would be most helpful to execute this file directly in an emulator.

Backup & Restore

One of the powerful ZXblast features is to backup a single instance file or at least make a complete system backup to continue the work later at the interrupted point. All CPU registers are saved and the whole memory content and stack pointer and can be loaded at a later point of time to continue exactly where the program was interrupted before.

Instance backup

This is done simply with save function (DS-S) from any ZX81 instance and choosing the extension .BAK for a backup file. This file will be stored then with all context information and memory from $2000-$FFFF ($E000 size).

MYWORK.BAK

This feature can be used to save a long running program or a played game at a specific level to be continued later. It can also be used to clone an instance like copy instance 1 to instance 2 or 3 for example. Instance files can be interchanged between different users as well or be used to find some bugs. As instance backup has more data to store via USB there is a small flicker and the video screen will disappear for 1-2 seconds and come back again.

Instance restore

Instances can be restored later simply by loading a .BAK file when calling the USB loader. If the extension .BAK was found it will be completely copied back to instance ram, restore all registers and continue at the interrupted position (program counter, PC).

An instance restore takes about 1-2 seconds to be restored as this has to be done with video screen switched off shortly. The screen may flicker.

System backup

A system backup can be done via the TOOLS menu in instance 0 only. It scans all active instances (if more than one is started) and saves all instance data in one big file:

The default filename used is but may be overridden by user to any other name as well.

ZXBLAST.BAK

Please take note that the system backup may take a longer time with video screen switched off as there is more data to store. It takes approx. 2 seconds per instance and can reach up to 15 seconds if all 7 instances are backuped.

System restore

A system restore can be done in two ways: Choosing the RESTORE SYSTEM option from the tools menu manually. Or shorter using the keystroke **L** when the ZXblast welcome screen is shown after power-up. The welcome screen can be forced when pressing **DS-R** in the config screen without powering off.

Restoring all instances will result in longer periods with no display (switched off temporarily) and can be calculated with approx. 2 seconds per instance or up to 15 seconds for all instances.

Different system backup files

It is possible to use more than one system backup file when entering a different name. The restore option is routed through the filemanager after system startup and pressing **L** for load of system backup but the displayed filename maybe changed by the user as well.

This offers more features to use different environments for developing, gaming and more while saving the prepared environment with any desired drivers or data loaded into memory areas for a quick and easy access. It is possible to restore any backup after power up with just two keystrokes for a convenient and professional work. Try it out. :-)

Reset system

There are several ways to reset the system by software and hardware. It is recommended to try a reset if the system hangs.

Reset a single ZX81 instance (by software)

A software reset can be simply done with key combination **DS-R** in the currently running ZX81 instance/session. This will reinitialize the ZX81 session beginning with a RAM test and cleared display and showing the standard input cursor K. A reset will clear all data of that instance but leave all other instances untouched.

Reset complete ZXblast (by software)

When DS-R is pressed in the config screen, the ZXblast is resetted by software. This results in all ZX81 session data lost and start the ZXblast completely new and clearing all data in memory. In fact not all data is cleared – the ZX81 sessions are still present and the memory of every instance kept untouched unless ZX81 instances are started/initialized new.

So developer could save important RAM data of instances to some files using the storing memory block function.

Hardware reset with switch (warm start)

ZXblast has a reset switch which can be used in case of complete system hang. There might be situations where the double shift keys do not work anymore due to a complex hang up. In this situation the reset switch can be used to come back to the ZXblast config screen. The last used ZX81 session is lost as context data like registers, stack pointer or program counter are unknown. But all halted ZX81 sessions are still accessible because the context information was stored before when they are interrupted.

Hardware reset with switch (cold start)

There is a simple routine inside of ZXblast to detect if the system was rebooted (warm start) or new powered-up. RAM contents is checked for this purpose. This is not reliable under all conditions and there might be situations where a warm start is tried but failed to modified RAM contents not detected by the firmware.

So there is a way to force a cold start while pressing the shift key and reset switch together or pressing shift key and power-up at the same time (with pressed shift key). This way should bring back the system safely if accidently a warm boot is detected but RAM contents partly lost.

Reset USB interface

There can be also situations of an unclean USB interface with waiting data at the USB port from a previous aborted USB command due to a system crash. This can be detected easily by watching the displayed version string on screen when using LOAD or SAVE. The USB interface can be cleared by entering an empty filename which leds the system read all unread and waiting data.

It returns after 1 or 2 seconds and the USB interface should be ready again when the USB functions are accessed again (LOAD/SAVE) with correct version message.

Power-off system

Finally if the system is not easy to bring back to work the power should be disconnected for at least 10 seconds and powered-up again with pressed shift key to force a cold boot of the system. If this doesn't help either check the correct seat of the edge connector or try to remove and reattach the ZXblast interface (**with no power of course !**).

Appendix 1 – list of key combinations

DS stands for double-shift key, please see section Getting started for more details about entering double-shift key combinations.

DS-0 return to ZXblast master/config program

DS-1 switch to instance 1 (or 2,3,4,5,6,7 alternatively)

DS-L load a program from USB flash media in active instance

DS-S store a program to USB flash media from active instance

DS-R reset instance (complete system reset when pressed in ZXblast instance 0)

DS-H do a screenshot/hardcopy of the currently shown display
(see section Debug functions for more details)