

1ZX-DELUXE+ MANUAL

2ZX81 clone single board computer with SD card drive, internet interface Zeddynet, 64K RAM and much more.



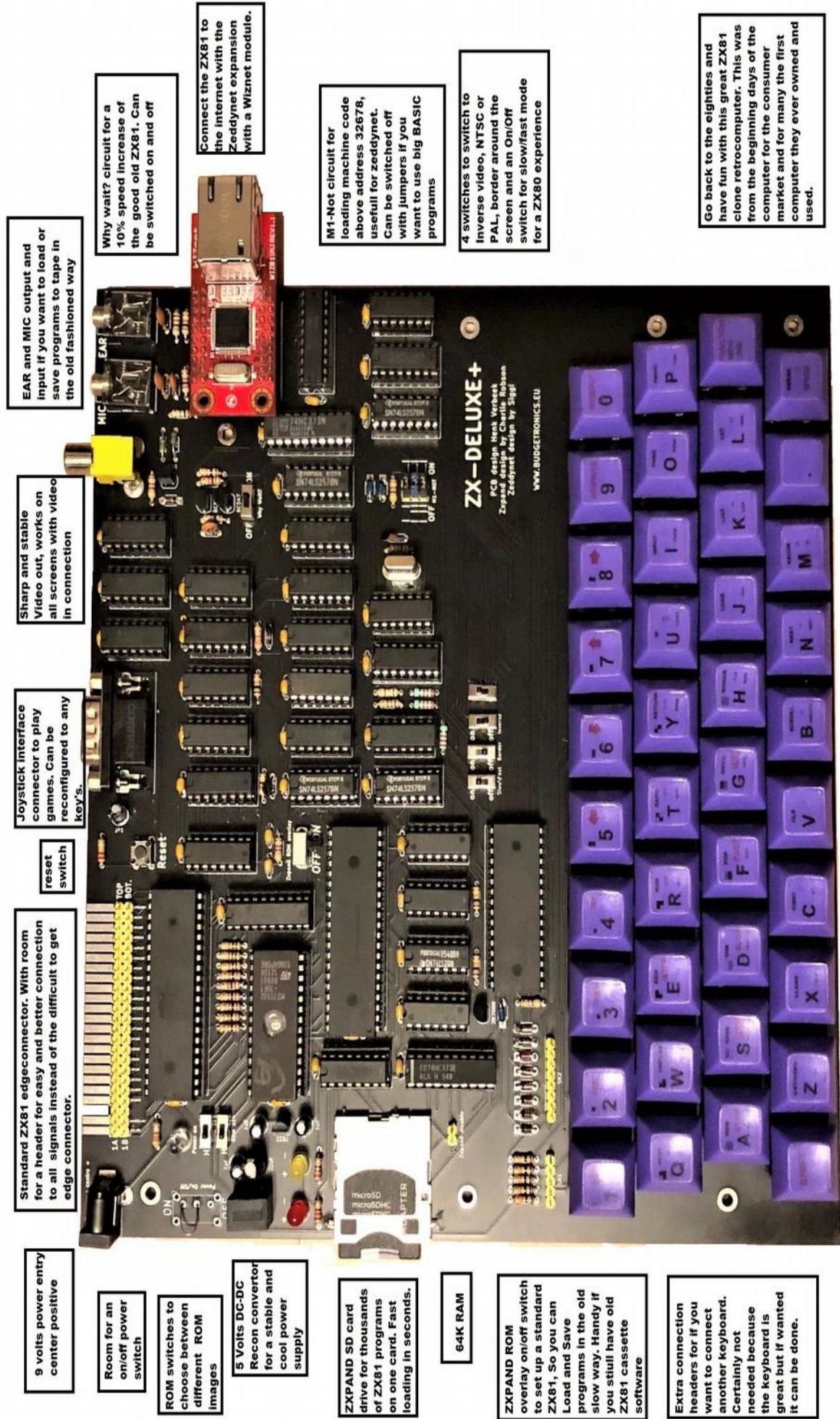
A single board computer that takes you back to the early eighties.

***Zxpand SD card drive designed by Charlie Robson, Zeddynet designed by Sigg.
Why Wait? Circuit Wilf Rigger.***

ZXDELUXE + PCB designed by H Verbeek

ZX-DELUXE+ single board computer specs overview:

- Integrated full moving keyboard with cherry keys.
- Compatible with the original ZX81.
- Zxpand SD card drive.
- Crisp and stable composite video out signal.
- 64K RAM.
- ZX81 compatible edge connector.
- Joystick interface that can be reconfigured to every key.
- Internet interface Zeddynet with WIZ8121MJ module, included!
- Why Wait? Circuit for 10% speed gain. Can be switched off.
- M1-NOT circuit to load machine code above address 32768. Can be switched off.
- 7 easy to adjust switches for inverse video, Border, NTSC/PAL, ROM selection and more.
- Extra connection on PCB for connecting another keyboard, but why should you?
- Ear and Mic input and output to load from tape cassette in standard ZX81 mode, if needed.
- Reset switch
- Power ON / OFF switch
- Zxpand ROM overlay on/off switch to go to standard ZX81 mode or use the SD drive Save and Load routines.
- ROM switch selectable between different ROM images



9 volts power entry
center positive

Room for an
on/off power
switch

ROM switches to
choose between
different ROM
images

5 Volts DC-DC
Recon converter
for a stable and
cool power
supply

ZXPAND SD card
drive for thousands
of ZX81 programs
on one card. Fast
loading in seconds.

64K RAM

ZXPAND ROM
overlay on/off switch
to set up a standard
ZX81. So you can
Load and Save
programs in the old
slow way. Handy if
you still have old
ZX81 cassette
software

Extra connection
headers for if you
want to connect
another keyboard.
Certainly not
needed because
the keyboard is
great but if wanted
it can be done.

Standard ZX81 edgeconnector. With room
for a header for easy and better connection
to all signals instead of the difficult to get
edge connector.

reset
switch

Joystick interface
connector to play
games. Can be
reconfigured to any
keys.

Sharp and stable
Video out, works on
all screens with video
in connection

EAR and MIC output and
input if you want to load or
save programs to tape in
the old fashioned way

Why wait? circuit for a
10% speed increase of
the good old ZX81. Can
be switched on and off

Connect the ZX81 to
the internet with the
Zeddynet expansion
with a Wiznet module.

M1-Not circuit for
loading machine code
above address 32678.
usefull for zeddynet.
Can be switched off
with jumpers if you
want to use big BASIC
programs

4 switches to switch to
Inverse video, NTSC or
PAL, border around the
screen and an On/Off
switch for slow/fast mode
for a ZX80 experience

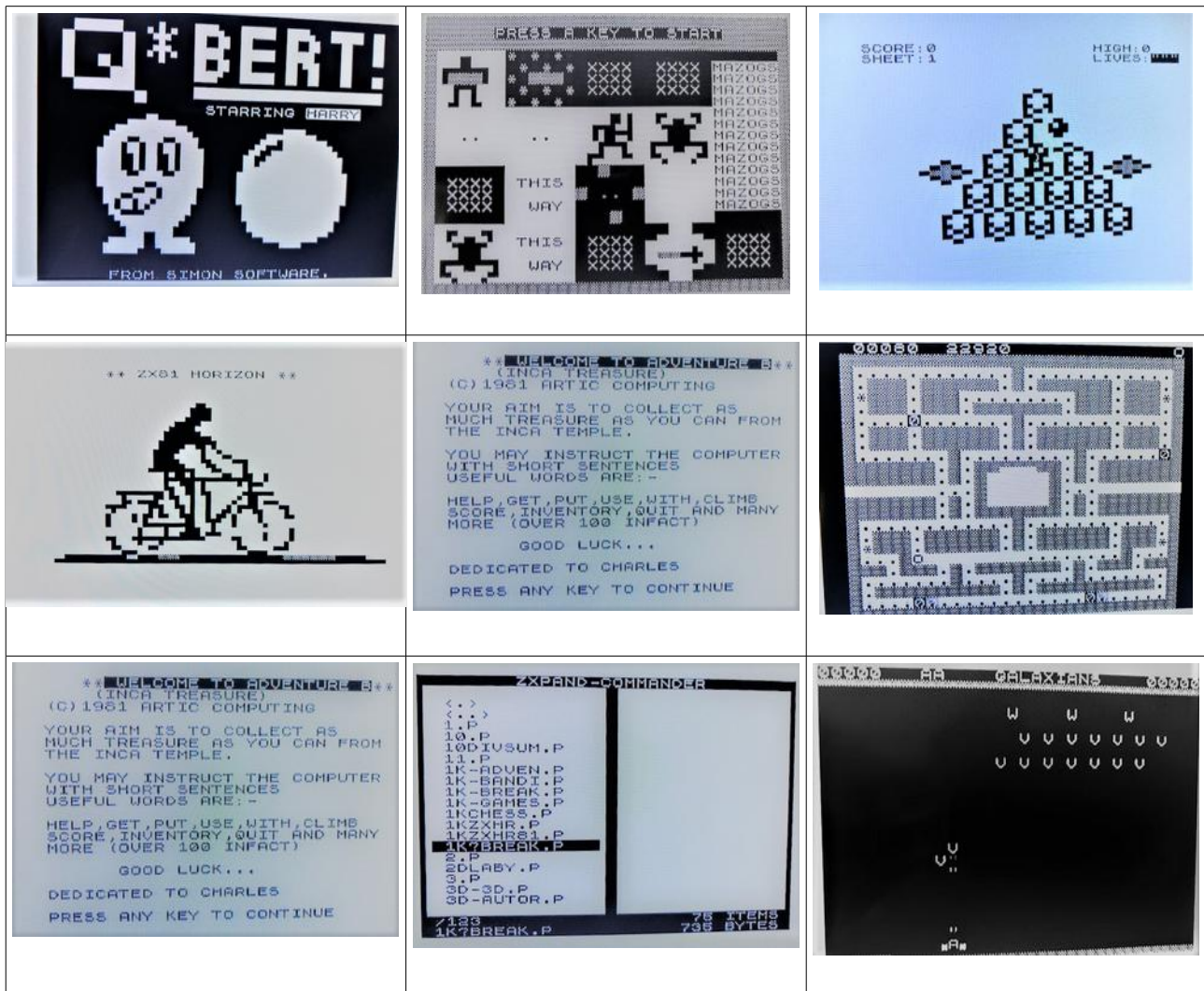
Go back to the eighties and
have fun with this great ZX81
clone retrocomputer. This was
from the beginning days of the
computer for the consumer
market and for many the first
computer they ever owned and
used.

Full moving keyboard
with 40 cherry
keyboard switches
for fast and relaxing
entering of programs.

A single board ZX81 clone computer fully compatible with the
real ZX81

Compact design measurements 24.5 cm wide and 22 cm deep

Play and enjoy those old retro games again with quick loading in seconds instead of the 15 minutes loading time from cassette tape in the eighties! Or just enjoy programming in BASIC again!



```

I AM IN A JUNGLE CLEARING
EXITS ARE SOUTH
I CAN ALSO SEE :
A BRANCH
TELL ME WHAT TO DO
N

```

Text adventures or serious applications all with a retro look. All game images are easy to download from the internet after searching for ZX81 programs and are easy transferred to SD card from a PC or laptop with SD card entry. You can find thousands of programs for the ZX81 on the internet. There are a lot of ZX81 fans who still produce software for this computer.

STARTING UP

Placing the jumpers

Before startup check if the jumpers/switches are in the right place.

Set both the A13 and A14 switches to the H (High) side (to the left). Set the Slow/fast jumper to ON, Border and inverse OFF for standard zx81 screen and NTSC / PAL to what you need but both work most of the times on monitors, just try out what works best. But remember if you use a speed test program then set the NTSC/PAL jumper on PAL because otherwise the speed test does not give the right speed.

Other settings for the A13 and A14 jumpers will be explained further on.

Connect the ZXDELUXE to a monitor and a 6 to 24 volts 1A power supply center positive and without SD card.

If all is well you get a message on top of the screen saying **ZXDELUXE 1.0** and the familiar ZX81 inverse **K** cursor in the left bottom corner.

Some important information, READ IT!

To make the ZXELUXE+ ZX81 compatible we have provided the PCB with exactly the same edge connector as the ZX81.

But remember we have NOT tested any add-ons which where made for the ZX81 so try them out at your own risk and we do **not guarantee** they will work.

The reason for this can be the fact that the Zxpan and Zeddynet are integrated and this can get into conflict with add-ons.

The most used expansion was the 16K ram expansion on this edge connector but you will understand that there is no reason to plug this into the ZXDELUXE+ because it already has 64K of RAM memory so we do not advice to try out any RAM extensions.

Inside the provided ROM there is also a surprise extra, a ZX80 without ZXpand support but you can use the 3.5 jacks to Load and Save tapes. So if you want to experiment with a ZX80 you have to set the A13 and A14 jumpers both to Low.

Possible jumper settings are:

1. A14 = LOW, A13 = LOW - ZX80 mode without ZXpand support. in this mode Fast / Slow mode switch must be OFF
2. A14 = HIGH, A13 = HIGH - ZX81 BASIC with ZXPAND support. Fast / Slow mode switch must be ON

In ZX80 mode you can Load from and Save to tape by typing Load or Save.

In ZX81 mode you can Load from tape by typing Load "" (so without program name) and the tapeloading routine will start. Saving to tape will not be possible in ZX81 with Zxpan

mode because you can only save to the SD card. And let's be honest why would you want to save to tape now you can save the programs to an SD card. If you really want to use the ZX81 tape Save routine you have to switch off the Zxpannd ROM overlay with the switch. Then you have the standard ZX81 mode.

If you type Load with a program name it will always load from SD card.

Using the Zxpannd SD card drive

Zxpannd Designed by Charlie Robson

GETTING STARTED

Format a SD card - you can use any of the standard FAT format types: 12, 16 and 32 are supported. Windows based PCs can generally format cards directly.

Once formatted, you can save some ZX81 programs to your card. These are widely available around the internet. They typically have the extension '.P'. If you come across files with the .81 extension, these should be renamed to have a 'P' extension – the formats are identical.

Long filenames are not supported. Filenames should use **a maximum of 8 characters** followed by the extension, the DOS short name standard.

You may want to organise your files on the card by creating directories, again using a maximum of 8 characters maximum in the name, and putting a few files in each. This should make finding the file you want much easier.

Just insert the SD card and switch on.

To load (for example) the program called 'MAZOGS.P' enter the command:

LOAD "MAZOGS"

It is not normally necessary to add the .P extension, it is generally assumed.

COMMAND REFERENCE

The built-in commands relating to the ZX printer have been replaced with those required to usefully operate the ZXpannd interface. For example the CAT command replaces COPY - therefore to get CAT, you press the Z key in K mode.

CONFIG

Press shift-G in K mode – replaces 'LLIST' command

The CONFIG command is used to configure the ZXpannd interface and how the ZX81 works with it.

Parameters to the command and their effects are:

CONFIG "V"	Display the version number of the ZXpannd firmware
CONFIG "D=path"	Set the current directory
CONFIG "D=" or CONFIG "D=/"	Change to the root directory
CONFIG "J=UDLRF"	The joystick port is scanned during the INKEY\$ command, select the keys returned for

CONFIG "C=7F"	Up Down Left Right and Fire. The default is J=5678 and . Enable autoboot. A program called "menu.p" will automatically run on power on or reset.
CONFIG "C=FF"	Disable autoboot. Power on or reset will bring up the inverse K prompt.

Configuration bits are used to specify certain operating modes of the ZX81. The bits are combined into the configuration byte.

AUTOBOOT

The ZXpand can be configured to automatically run a program called 'menu.p' when the ZXDELUXE+ is switched on or reset. Nominally the ZXpand is set to autoboot when the SHIFT key is pressed during power on.

However, you can force the ZXpand to always autoboot by clearing bit 7 in the configuration parameters:

CONFIG "C=7F"
 CONFIG "C=FF" will re-enable it.

Bit 6 controls the behaviour of space/break during program execution. With bit 6 set, behaviour is as normal. With bit 6 clear, you must press shift & space in order to break into the running BASIC code.

INKEY\$ can be used to detect the directions of an attached joystick. No diagonals are usable at this time. The default joystick codes are 6, 7, 5, 8 and . which map partly to the cursor directions.

CAT

CAT or CAT ""	Display the current directory. Press enter to view subsequent pages.
CAT "path"	Display the contents of a directory

Press Z in K mode - replaces 'COPY' command

It is sometimes useful to know what files are available on the card. The CAT command will do this. It can also be used for directory navigation.

The CAT command without a parameter or an empty string will list the content of the Current Working Directory (CWD). To list the content of directories relative to this then you must specify the path as you might for a DOS based system.

Directories are identified by a following forward slash.

For example:

CAT ""

... might display:

```
GAMES/
UTILITY/
MYPROG.P    11K
```

Subsequently typing:

CAT "GAMES"

... might then display:

```
../  
MAZOGS.P    15K  
3DMONST.P   13K
```

To change the CWD you prefix the directory name with '>'. This implies 'going to' the directory.

CAT ">GAMES"

Having changed working directory then issuing one of the following commands:

```
CAT  
CAT ""
```

... might show:

```
../  
MAZOGS.P  
3DMONST.P
```

... and from there:

CAT "../UTILITY"

... would show the content of the folder but not change to it.

There is support for wildcards when CATting files. Wildcard operators are similar to those used in DOS.

'*' will match with any sequence of characters

'?' will match with a single character.

CAT "ST*"

... will show all files beginning with 'ST'.

CAT "S?T*"

... will show all files having S & T as the 1st and 3rd characters.

Wild cards may be used in conjunction with directory specifications.

CAT "../GAMES/S/STAR*"

... will show all the star-based games in the sub-folder specified.

To create a folder in the CWD you would issue the command:

CAT "+dirname"

Many filing systems automatically add folders for internal housekeeping and these may have combinations of naming and flags which produces seemingly corrupt output. It is safe to ignore these, e.g:

/TRASH-?1

LOAD

```
LOAD "filename"  
LOAD "filename;address"  
LOAD "filename:argument"  
LOAD "$"  
LOAD ""
```

LOAD will take data from the file with the specified name on the card and place it in memory. The basic LOAD command will work just as you expect. Specifying an empty name will invoke the tape loader as normal to allow you to load a program from cassette.

To put data into specific locations in memory you can use the following form:

```
LOAD "filename;nnnnn"
```

... where nnnnn represents a decimal number specifying the target address.

Example: Load "NFM-32KE.BIN;32768" . Loads the Zeddynet file server software to the target address 32768

Folders other than the CWD can be specified.

```
LOAD "../GAMES/MAZOGS"
```

To prevent a program from auto-running append the keyword STOP (shift-A) to the end of the filename. E.g:

```
LOAD "MAZOGS STOP "
```

SAVE

```
SAVE "filename"  
SAVE "filename;sssss,IIII"  
SAVE "+filename"  
SAVE ">filename"
```

SAVE writes data to the specified file on the card. As with the LOAD command, the basic SAVE invocation will do as you expect. You will not be able to SAVE to cassette tape.

An alternate form of the command is used to save a specific memory location to the card, with a start address specified by ssss, and a length of IIII bytes. All numbers are specified in decimal.

```
SAVE "filename;0,8192"
```

Options exist to control how existing files are treated when SAVEing. Similar to the CAT command, the characters '>' and '+' modify the SAVE behaviour.

```
SAVE "+filespec"
```

Prefixing any valid SAVE specification with '+' will rename any existing file with the same name with a .BAK extension. If the backup file already exists, however, then an error will be generated.

SAVE ">filespec"

The '>' prefix will unconditionally overwrite any existing file with the same name.

DELETE "*filename.p*"

(Press shift-S in K mode – replaces 'LPRINT' command)

Unlike *LOAD* and *SAVE*, the .P extension is not assumed

BASIC ERROR CODES

The interface can report the following errors. They are shown in inverse video to distinguish them from standard system report codes.

Code	Meaning	Explanation
1	Fatal disk error	The card is unreadable due to a hardware problem or unformatted card.
2	Internal error	The card file system structures are inconsistent. Reset should fix this.
3	Not ready	The card is not responding or no card is present.
4	Not found	No such file exists.
5	No path	No such directory exists.
6	Invalid name	The specified name contains illegal characters.
7	Write protect	An attempt has been made to open a read-only file for writing.
8	Exists	An attempt was made to open a file for writing but the name is already used.
9	Boot error	Menu.p not found on the card root directory.
D	No FS	Card is not formatted or is damaged.
F	Timeout	A timed operation took too long to complete.

TROUBLESHOOTING

I see error 9 when I boot

ZXpand is set to auto-boot but there is no 'menu.p' file in the root directory of the SD card. See section on the CONFIG command.

My program won't run or looks weird

- Some programs access the ROM directly. The ROM changes for the ZXpand overlay/driver mean code has been moved or deleted. This usually leads to a crash.
- Some hires programs access the character set in ROM, they will show up with corrupted text. ZXpand uses the character set area of ROM for code.

Using Zeddynet

Zeddynet made by Siggi

For Zeddynet the WIZ811 internet module on the ZXDELUXE+ is used.

The internet connection works through a small program called "tnfsd" which must be installed on a Windows PC which can be downloaded from:

<http://spectrum.alioth.net/doc/index.php/Downloads>.

The tnfsd program is originally made for working with a Zx Spectrum but it also works with the ZX81/ZXDELUXE+.

After installing this program you have to start it up on the PC and make sure it is running.

Now connect the WIZ module with an ethernet cable to the same network hub where also your PC is connected to. Start the ZXDELUXE + and load the Zeddynet program IPCONFIG and type RUN.

You get a message which ask to press a key for menu but ignore this for now and do not touch the keyboard.

After a few seconds the program tries to configure the WIZNET module and give it its own IP address. If this succeeds the programs finishes and you can use the keyboard to load another program to use Zeddynet.

If the programs stays stuck or does not succeed the tnfsd program is not running on the PC or the ethernet cables are not connected in the right way and PC and the ZXDELUXE+ do not see each other.

Remember that each time you power down the ZXDELUXE+ or reset it, you have to run IPCONFIG again before you are going to use Zeddynet.

If all is oke you can try out the other programs which are made for Zeddynet. Some have an E extension like NFM and NFME. The E means English otherwise it will be German.

You can experiment with Telnet, IRC client, pinging, emailing and so on. Do not expect to get a real internet experience because you cannot compare this with the internet we have today on a PC. So only text and no graphics at all, or it must be ASCII graphics. It is just a bit of fun to experiment with but do not expect that you are going to use it in your normal internet life.

Using the file server NFM-32KE.BIN

Steps to take:

-Make sure the M1-not circuit is set to ON with the jumpers (as described earlier and as explained on the PCB screen) to load machine code above 32K

-Start up the Tnsfd server on the PC (make also a Directory for files called ZX81 on the same drive of the PC)

-Run ipconfig as described.

-Then type Load "NFM-32KE.BIN;32768" – loads the NFM.BIN (machine code) file from address 32768. This is the address above the normal area where the Basic programs resides.

-Start the filemanager NFM with RAND USR 32768

And if all is well the programs starts and shows the Directory named ZX81 on your PC with the programs you have placed there. Type H to see all the commands and start experimenting.

The NFM program is loaded above 32K and if you LOAD a program into the ZXDELUXE+ with NFM it will load in the RAM area where the Basic programs resides. The NFM program exits and you can run the basic program. The NFM program will stay above the 32k area even if you type NEW to clear the basic program or reset the ZXDELUXE+. So you can start it up again by typing RAND USR 32768. But remember after a reset the IPCONFIG program has to be run again to configure the network connection. Only if you power down the NFM program is cleared in memory.

To make things easier you can make a small program yourself that after loading the ipconfig program, and after configuring the Wiznet module, then loads the NFM program and executes it. You can do this by adding some commands to the ipconfig program. For example load the ipconfig program and type break (shift and Space/Break keys together) Add 2 extra lines:

```
3 Load "NFM-32KE.BIN;32768"
```

```
4 RAND USR 32768
```

And save the program for later use.

Using Telnet

With telnet you can log in to the old fashioned bulletin boards. Yes they still exist. Look for a list of active BBS here <https://www.telnetbbsguide.com/bbs/list/detail/>

Just start the Tnsfd server on the PC and run the IPCONFIG program to set things up. Then load the Telnet software and run it. Just enter the host (the name or the IP address to be connected to) and enter the port number (port 23 is standard most of the times so you also can press Enter/Newline).

If all is well you will be connected to the BBS and do your thing. If the BBS is not active the program will stop. You can RUN it again and try another BBS. Most of the times it takes some tries because a lot of the BBS are not always 24 hours online. You can also make your own Telnet connection with your PC using a telnet program on your PC of your own choice.

Using IRC

There are different IRC chat programs (IRC, IRC-ANSI32, IRC_ANSI40 and IRC_ANSI) and they all seem to work fine,

As always first run the IPCONFIG program and after this LOAD and RUN the IRC-ANSI program. Enter a nickname and to test it most of the times you can get a connection if you choose Z, at input default port (just press NEWLINE) and password stays empty. If all is well you enter the chat and have to enter the right channel. So type /JOIN #ZXTEAM, (to get the # symbol hold the SHIFT key and the SPACE key) In this way you can chat with others.

With SHIFT+2 and SHIFT+3 you can choose between uppercase and lowercase. Sometimes usefull for passwords.

The IRC chat commands are:

/join

Type /join #channelname -- to join a channel of your choice

Example: /join #bossmom

/me

The /me is an action message.

Type /me 'does anything'

Example: /me waves hello

What it looks like:

* bossmom waves hello

/msg

Type /msg nickname (message) to start a private chat.

Example: /msg puddytat Hey tat, how are you?

What it looks like:

-> *puddytat* Hey tat, how are you?

/nick

/nick changes your nickname

Example: type /nick newnickname (limit 9 characters)

What it looks like: I typed /nick luv2quilt

*** bossmom is now known as luv2quilt

/notice

A notice is used to send a short message to another person without opening up a private window.

Type /notice nickname (message)

Example: /notice badnick Please change your nickname for this family channel.

What it looks like:

-> -badnick- Please change your nickname for this family channel.

/part

Type /part -- to leave one channel

Type /partall -- to leave all the channels you are in

/ping

Type /ping nickname. What this command does is give you the ping time, or lag time, between you and the person you pinged. Lag can be explained as the amount of time it takes for you to type your message and for others to read your messages.

Unfortunately, lag is always a part of IRC, although most times it's not a problem, just a nuisance.

Example: /ping luv2quilt

What it looks like:

[19:04] -> [luv2quilt] PING

[19:04] [luv2quilt PING reply]: 0secs

/quit

Type /quit to leave IRC altogether. This disconnects mirc from the server.

Example: /quit Going out for dinner...nite all

What it looks like:

*** Quits: saca (Leaving)

Using PING

Just to see if there is a connection you can use this PING program. You can enter a IP address or just type in for example GOOGLE.COM and the pinging starts. Press SPACE to stop pinging. And enter a . to leave the program. Do not forget to first run the IPCONFIG program before starting PING.

Using Zeddyfox

After running the IPCONFIG program load the Zeddyfox web browser by typing:
LOAD "ZF-32K.bin;32768"

Testing go to www.zx81.nl/dload

Remember Zeddyfox only can show websites that consists of text and nothing more.

PCB LAYOUT ZXDELUXE+

