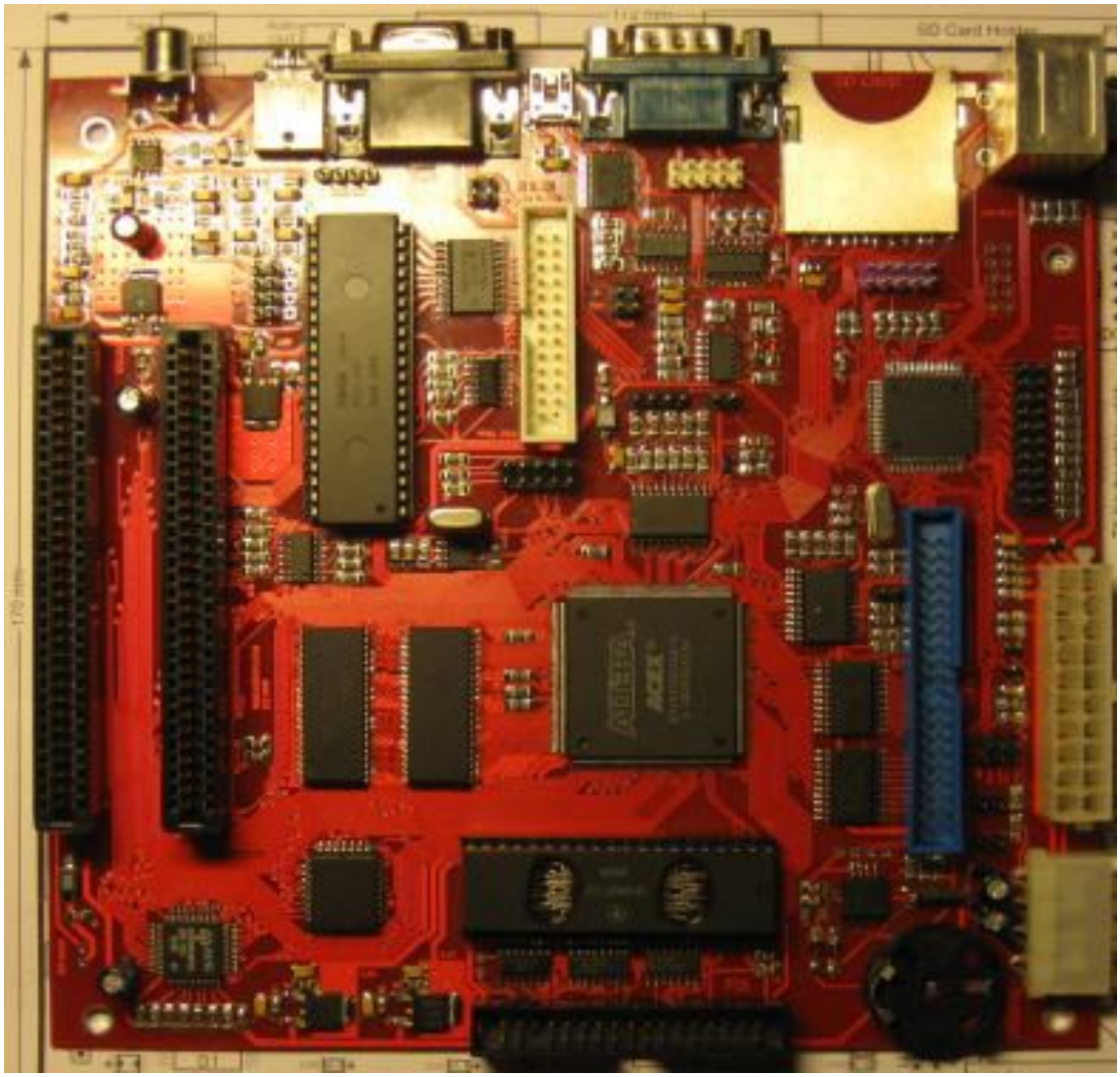
# ZX Evolution. User manual.

## *(ZX Evolution revision C)*



(version 03/25/2013)

www.nedopc.com

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# 1 Introduction

ZX Evolution is Spectrum compatible computer. Computer based on programmable logic device Altera EP1K50Q208 and has flexible architecture, but board content original main chips (Z80, sound coprocessor, floppy controller).

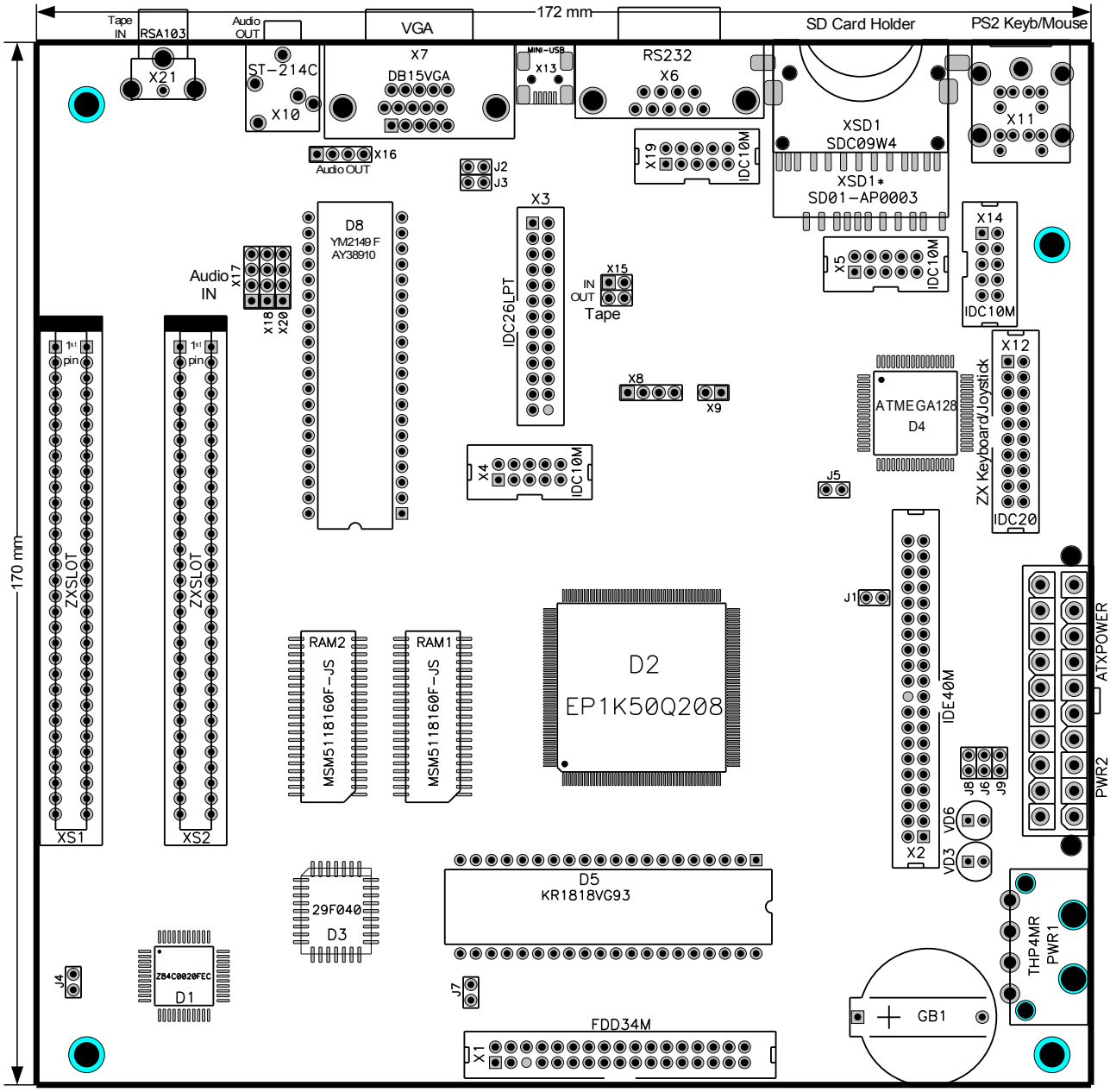
ZX Evolution board designed by miniITX standard for easy installation to miniITX, mATX or ATX case.

Main features:

- Z80 on 3.5MHz (standard)/7 MHz (turbo mode) without wait circles/14MHz (mega turbo mode) with wait circles;
- 4 MBytes RAM, 512KBytes ROM (flash ROM);
- MiniITX form factor, support ATX or +5v,+12v power supply;
- 2 ZXBUS slots;
- Peripheral controller ATMEGA128;
- PS/2 keyboard/mouse interface;
- IDE interface [parallel ATA] (one channel, up to 2 devices on master/slave mode);
- SD(HC) memory card interface;
- Floppy disk interface based on WDC1793 (support up to 4 drives);
- RS232 interface;
- Integrated RS232-USB bridge;
- Realtime/Calendar (RTC);
- Sound interfaces: AY38910/YM2149F, beeper, pwm;
- Joystick and mechanical (original) keyboard interface;
- Tape interface (input/output);
- RGB video out (SCART compatible);
- VGA (scan doubler).

# 2 Board layout

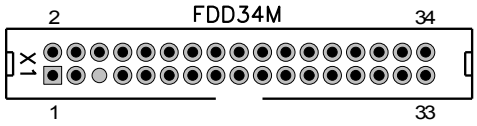
Layout of components and connectors on board:




Most usable connectors place to ATX cases “window”.
Board use standard ATX or +5v,+12v power supply.
**Warning:** Only ZXBUS compatible devices may installed to slot (for example NeoGS sound card: http://www.nedopc.com/gs/ngs.php ).

# 3 Connectors

## *3.1 X1. Floppy disk*

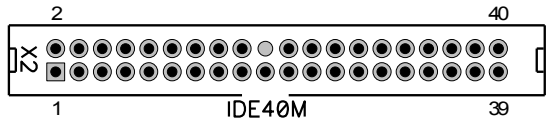



Connector for floppy drive[s] (3.5' or 5.25'). Supported up to four devices.
First pin have square pad.

Pins description:

| № | Name | Description | № | Name | Description |
|---|---|---|---|---|---|
| 1 | GND | Ground | 2 | | Not used |
| 3 | GND | Ground | 4 | | Not used |
| 5 | KEY | key (no contact) | 6 | DS3 | Select 3 drive (D) |
| 7 | GND | Ground | 8 | IDX | Index |
| 9 | GND | Ground | 10 | DS0 | Select 0 drive (A) |
| 11 | GND | Ground | 12 | DS1 | Select 1 drive (B) |
| 13 | GND | Ground | 14 | DS2 | Select 2 drive (C) |
| 15 | GND | Ground | 16 | MOTON | Motor on |
| 17 | GND | Ground | 18 | DIRC | Direction |
| 19 | GND | Ground | 20 | STEP | Step |
| 21 | GND | Ground | 22 | WD | Write data |
| 23 | GND | Ground | 24 | WG | Write enable |
| 25 | GND | Ground | 26 | TR00 | Track 0 |
| 27 | GND | Ground | 28 | WP | Write protect |
| 29 | GND | Ground | 30 | RDDATA | Read data |
| 31 | GND | Ground | 32 | SIDE1 | Side select |
| 33 | GND | Ground | 34 | | Not used |

## *3.2 X2. IDE*



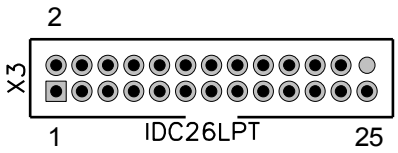

Connector for IDE (parallel ATA) drives. Supported up to two drives on master/slave mode.
First pin have square pad.

Pins description:

| № | Name | Description | № | Name | Description |
|---|---|---|---|---|---|
| 1 | RESET | Reset | 2 | GND | Ground |
| 3 | D07 | Data7 | 4 | D08 | Data8 |
| 5 | D06 | Data6 | 6 | D09 | Data9 |
| 7 | D05 | Data5 | 8 | D10 | Data10 |

| | | | | | |
|---|---|---|---|---|---|
| 9 | D04 | Data4 | 10 | D11 | Data11 |
| 11 | D03 | Data3 | 12 | D12 | Data12 |
| 13 | D02 | Data2 | 14 | D13 | Data13 |
| 15 | D01 | Data1 | 16 | D14 | Data14 |
| 17 | D00 | Data0 | 18 | D15 | Data15 |
| 19 | GND | Ground | 20 | KEY | KEY (no contact) |
| 21 | | Not used | 22 | GND | Ground |
| 23 | DIOW | | 24 | GND | Ground |
| 25 | DIOR | | 26 | GND | Ground |
| 27 | IORDY | | 28 | | Not used |
| 29 | | Not used | 30 | GND | Ground |
| 31 | | Not used | 32 | | Not used |
| 33 | DA1 | Address1 | 34 | | Not used |
| 35 | DA0 | Address0 | 36 | DA2 | Address1 |
| 37 | CS0 | Select0 | 38 | CS1 | Select |
| 39 | DASP | Indicator | 40 | GND | Ground |

## *3.3 X3. Printer (non-full LPT).*

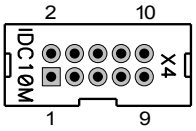



Connector for Printer (recommends to use EPSON-compatible printer).
First pin have square pad.

Pins description:

| **№** | **Name** | **Description** | **№** | **Name** | **Description** |
|---|---|---|---|---|---|
| 1 | STROBE | Strobe | 2 | | Not used |
| 3 | DATA0 | 0 bit of data | 4 | ERROR | Error |
| 5 | DATA1 | 1 bit of data | 6 | | Not used |
| 7 | DATA2 | 2 bit of data | 8 | | Not used |
| 9 | DATA3 | 3 bit of data | 10 | GND | Ground |
| 11 | DATA4 | 4 bit of data | 12 | GND | Ground |
| 13 | DATA5 | 5 bit of data | 14 | GND | Ground |
| 15 | DATA6 | 6 bit of data | 16 | GND | Ground |
| 17 | DATA7 | 7 bit of data | 18 | GND | Ground |
| 19 | | Not used | 20 | GND | Ground |
| 21 | BUSY | Busy | 22 | GND | Ground |
| 23 | PE | Paper end | 24 | GND | Ground |
| 25 | | Not used | 26 | KEY | KEY (no contact) |

## 3.4 X4. JTAG for EP1K50Q208

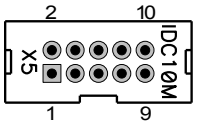



Connector for programming FPGA EP1K50Q208 via JTAG interface (with ByteBlasterMV or other programming device).
First pin have square pad.

Pins description:

| № | Name | Description | № | Name | Description |
|---|---|---|---|---|---|
| 1 | TCK | Clock | 2 | GND | Ground |
| 3 | TDO | Data output | 4 | 3V3 | Power +3.3V |
| 5 | TMS | Mode select | 6 | | Not used |
| 7 | | Not used | 8 | | Not used |
| 9 | TDI | Data input | 10 | GND | Ground |

## 3.5 X5. AVR ISP for ATMEGA128

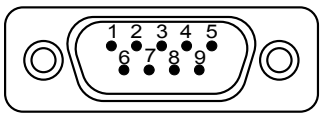



Connector for programming ATMEGA128 via ISP (with ByteBlasterMV or other programming device).
First pin have square pad.

Pins description:

| № | Name | Description | № | Name | Description |
|---|---|---|---|---|---|
| 1 | CK | Clock | 2 | GND | Ground |
| 3 | DO | Data output | 4 | VCC5 | Power +5V |
| 5 | RST | Reset | 6 | | Not used |
| 7 | | Not used | 8 | EXCLOCK | External clock |
| 9 | DI | Data input | 10 | GND | Ground |

## 3.6 X6. RS232 communication

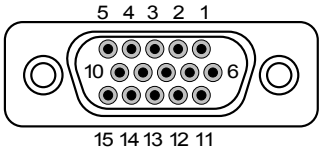



Communication port used for connection with other computer or communicating devices (for example modem). Up to 115200BOD transfer speed.

Pins description:

| № | Name | Description | № | Name | Description |
|---|---|---|---|---|---|
| 1 | | Not used | 6 | | Not used |
| 2 | RXD | Receive data | 7 | RTS | Request to send |
| 3 | TXD | Transmit date | 8 | CTS | Clear to send |
| 4 | | Not used | 9 | | Not used |
| 5 | GND | Ground | Shield | | Connected to ground |

## 3.7 X7. VGA

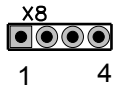



Connector for monitor or TV.
Warning: Monitor or TV must support 50Hz, 31KHz video rate. Please refer to monitor manual or compatible monitors list: http://www.nedopc.com/zxevo/zxevo_supported_monitors.pdf .

Pins description:

| № | Name | Description | № | Name | Description |
|---|---|---|---|---|---|
| 1 | R | Red | 9 | VIDEOVCC | J3 open: not used<br>J3 short: +5V |
| 2 | G | Green | 10 | GND | Ground |
| 3 | B | Blue | 11 | GND | Ground |
| 4 | | Not used | 12 | | Not used |
| 5 | | Not used | 13 | HS | Horizontal synchronization |
| 6 | GND | Ground | 14 | VS | Vertical synchronization |
| 7 | GND | Ground | 15 | CSYNC | J2 open: not used<br>J2 short: composite synchronization |
| 8 | GND | Ground | Shield | | Shield connect to ground |

## 3.8 X8. RGB video out




Connector for monitors or TV (via SCART).
Recommends to use couple with X9 for PAL coder.
First pin have square pad.

Pins description:

| № | Name | Description | № | Name | Description |
|---|---|---|---|---|---|
| 1 | R | Red | 2 | G | Green |
| 3 | B | Blue | 4 | CSYNC | Composite synchronization |

## 3.9 X9. Video out power supply


1. GND – ground;
2. VIDEOVCC – +5V.

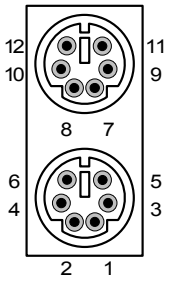
Recommends to use couple with X8 for PAL coder.
First pin have square pad.

## 3.10 X10. 3.5 Audio out

Connector for headphone or speaker.

Shield connect to ground.

## 3.11 X11. PS/2 keyboard and mouse

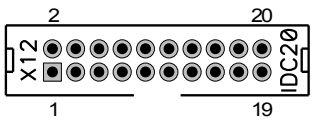



Connector for PS/2 keyboard and mouse. Keyboard connect into near from board (bottom) socket. Mouse connect into far from board (top) socket. Shield connect to ground.

Pins description:

| № | Name | Description | № | Name | Description |
|---|---|---|---|---|---|
| 1 | DATA | Keyboard data | 7 | DATA | Mouse data |
| 2 | | Not used | 8 | | Not used |
| 3 | GND | Ground | 9 | GND | Ground |
| 4 | +5V | Power +5V | 10 | +5V | Power +5V |
| 5 | CLK | Keyboard clock | 11 | CLK | Mouse clock |
| 6 | | Not used | 12 | | Not used |

## 3.12 X12. Joystick and original ZX keyboard




Connector for original ZX keyboard or joystick. First pin have square pad.

Pins description:

| № | Name | Description | № | Name | Description |
|---|---|---|---|---|---|
| 1 | ZXROW0 | 0 row of original keyboard | 2 | ZXROW1 | 1 row of original keyboard |
| 3 | ZXROW2 | 2 row of original keyboard | 4 | ZXROW3 | 3 row of original keyboard |
| 5 | ZXROW4 | 4 row of original keyboard | 6 | ZXROW5 | 5 row of original keyboard |
| 7 | ZXROW6 | 6 row of original keyboard | 8 | ZXROW7 | 7 row of original keyboard |
| 9 | RST | Reset | 10 | ZXCOL4 | 4 column of original keyboard |
| 11 | ZXCOL3 | 3 column of original keyboard | 12 | ZXCOL2 | 2 column of original keyboard |
| 13 | ZXCOL1 | 1 column of original keyboard | 14 | ZXCOL0 | 0 column of original keyboard |
| 15 | GND | Ground | 16 | JOYL | Left of joystick |
| 17 | JOYR | Right of joystick | 18 | JOYU | Up of joystick |
| 19 | JOYD | Down of joystick | 20 | JOYF | Fire of joystick |

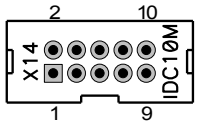
### 3.12.1 Using Kempston and Sinclair joysticks

| Sinclair 1 | | | Sinclair 2 | | | Kempston | |
|---|---|---|---|---|---|---|---|
| Function | ZX keyboard button | X12 shorted pins | Function | ZX keyboard button | X12 shorted pins | Function | X12 shorted pins |
| left | 1 | 4 - 14 | left | 6 | 5 - 10 | left | 15 - 16 |
| right | 2 | 4 - 13 | right | 7 | 5 - 11 | right | 15 - 17 |
| down | 3 | 4 - 12 | down | 8 | 5 - 12 | up | 15 - 18 |
| up | 4 | 4 - 11 | up | 9 | 5 - 13 | down | 15 - 19 |
| fire | 5 | 4 - 10 | fire | 0 | 5 - 14 | fire | 15 - 20 |

## *3.13 X13. Mini USB (USB-RS232 bridge out)*

For connecting to other computer in USB-slave mode.

## *3.14 X14. AVR JTAG for ATMEGA128*




Connector for programming ATMEGA128 via JTAG ICT.
First pin have square pad.

Pins description:

| № | Name | Description | № | Name | Description |
|---|---|---|---|---|---|
| 1 | TCK | Clock | 2 | GND | Ground |
| 3 | TDO | Data output | 4 | VCC | Power +5V |
| 5 | TMS | Mode select | 6 | PRGRST | Reset |
| 7 | VCC | Power +5V | 8 | | Not used |
| 9 | TDI | Data input | 10 | GND | Ground |

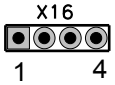
## *3.15 X15. Tape in/out*


Connector for tape device.
First pin have square pad.

Pins description:

| № | Name | Description | № | Name | Description |
|---|---|---|---|---|---|
| 1 | IN | Tape input | 2 | GND | Ground |
| 3 | OUT | Tape output | 4 | GND | Ground |

## *3.16 X16. Audio out (duplicate X10)*

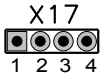



Connector for headphone or speaker.
First pin have square pad.

Pins description:

| № | Name | Description | № | Name | Description |
|---|---|---|---|---|---|
| 1 | LOUT | Left | 2 | GND | Ground |
| 3 | GND | Ground | 4 | ROUT | Right |

## 3.17 X17, X18, X20. Audio in

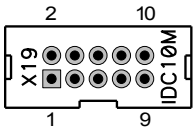



Connector for external audio sources (for example CDROM, NeoGS, TurboSound). First pin have square pad.

Pins description:

| № | Name | Description | № | Name | Description |
|---|---|---|---|---|---|
| 1 | LIN | Left | 2 | GND | Ground |
| 3 | GND | Ground | 4 | RIN | Right |

## 3.18 X19. RS232 communication (duplicate X6)

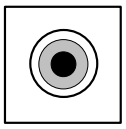



Communication port used for connection with other computer or communicating devices (for example modem). Up to 115200BOD transfer speed.
First pin have square pad.

Pins description:

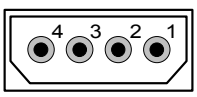
| № | Name | Description | № | Name | Description |
|---|---|---|---|---|---|
| 1 | | Not used | 2 | RXD | Receive data |
| 3 | TXD | Transmit data | 4 | | Not used |
| 5 | GND | Ground | 6 | | Not used |
| 7 | RTS | Request to send | 8 | CTS | Clear to send |
| 9 | | Not used | 10 | VCC | +5V |

## 3.19 X21. Tape IN (duplicate X15)



For connecting tape device.

## 3.20 PWR1. Power



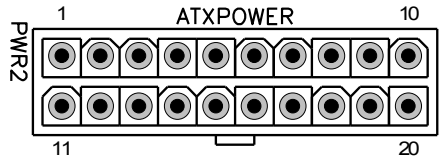

Connector for non-standard power supply (+12V, +5V, GND).

Pins description:

| № | Name | Description | № | Name | Description |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 1 | VCC5 | Power +5V | 3 | GND | Ground |
| 2 | GND | Ground | 4 | VCC12 | Power +12V |

## 3.21 PWR2. ATX power

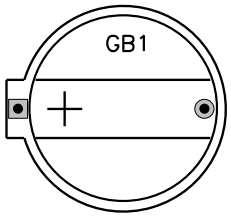



Connector for ATX power supply.

Pins description:

| № | Name | Description | № | Name | Description |
|---|---|---|---|---|---|
| 1 | | Not used | 11 | | Not used |
| 2 | | Not used | 12 | | Not used |
| 3 | GND | Ground | 13 | GND | Ground |
| 4 | VCC5 | Power +5V | 14 | PS_ON | Power on |
| 5 | GND | Ground | 15 | GND | Ground |
| 6 | VCC5 | Power +5V | 16 | GND | Ground |
| 7 | GND | Ground | 17 | GND | Ground |
| 8 | PWRGOOD | Power is good | 18 | | Not used |
| 9 | VCC5STBY | Standby +5V | 19 | VCC5 | Power +5V |
| 10 | VCC12 | Power +12V | 20 | VCC5 | Power +5V |

## 3.22 GB1. Battery holder




Holder for RTC battery.
Please use CR2032 batteries (3Volt).

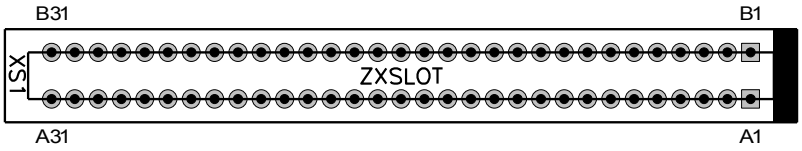
# 4 Jumpers and button

| № | Name | Default value | Description |
|---|---|---|---|
| J1 | enable IDERES | opened | Enable IDE reset signal to IDE drives if shorted. It need to some old drives (for example Samsung 10Gb drives). |
| J2 | enable composite sync to VGA | opened | Enable composite synchronization to VGA if shorted. |
| J3 | enable +5V to VGA | opened | Enable +5V to VGA if shorted. |
| J4 | 12v enable | opened | Enable +12V power supply to slots if shorted. |
| J5 | external clock | opened | Enable external clock to ATMEGA128 from AVR ISP connector (X5). |
| J6 | soft reset key | opened | Soft reset or power switching:<br>- connect «PWR SW» button from ATX case;<br>- soft reset (without restart ATMEGA128) if shorted few time. |
| J7 | HRDY->IP | opened | HRDY controlled IP pull-down to GND if closed. |
| J8 | NMI key | opened | Set NMI to Z80 if shorted. |
| J9 | hard reset key | opened | Hard reset (with restart ATMEGA128) if shorted.<br>Connect «Reset» button of AT or ATX case. |
| VD3[1] | HDD Led | | Connect «HDD LED» from AT or ATX case. |
| VD6[2] | PWR Led | | Connect «PWR LED» from AT or ATX case. |

1 If set contacts instead VD3 led on board (for example boards from NedoPC).
2 If set contacts instead VD6 led on board (for example boards from NedoPC).

# 5 ZXBUS slots

ZX Evolution have two slots compatible to ZXBUS standard.




ZXBUS pin step is 2.54mm.

First pin have square pad. First pin is near to rear side of ATX case.

**Warning:** ZXBUS cards key must placed to first pins side of slot. If ZXBUS card not have key, please refer to ZXBUS card user manual. If you install ZXBUS card incorrectly than ZXEvolution board may be malfunction.

**Warning:** ZX Evolution developer not guaranteed correct working ZXBUS cards from other developers. ZX Evolution developer not test ZXBUS cards from other developers. Testing must be organized by ZXBUS cards developer.

**Warning:** If ZXBUS card need +12V power on slot than J4 jumper on ZX Evolution board must be shorted.

Slot pins description:

| № | Name | Description | № | Name | Description |
|---|---|---|---|---|---|
| A1 | A14 | 14 address line of CPU | B1 | A15 | 15 address line of CPU |
| A2 | A12 | 12 address line of CPU | B2 | A13 | 13 address line of CPU |
| A3 | +5V | Power +5V | B3 | D7 | 7 data line of CPU |
| A4 | DCDOS | TRDOS enabled | B4 | | Not used |
| A5 | | Not used | B5 | | Not used |
| A6 | GND | Ground | B6 | D0 | 0 data line of CPU |
| A7 | GND | Ground | B7 | D1 | 1 data line of CPU |
| A8 | | Not used | B8 | D2 | 2 data line of CPU |
| A9 | A0 | 0 address line of CPU | B9 | D6 | 6 data line of CPU |
| A10 | A1 | 1 address line of CPU | B10 | D5 | 5 data line of CPU |
| A11 | A2 | 2 address line of CPU | B11 | D3 | 3 data line of CPU |
| A12 | A3 | 3 address line of CPU | B12 | D4 | 4 data line of CPU |
| A13 | IORQGE | Disable other devices (io catch) | B13 | INT | Interrupt |
| A14 | GND | Ground | B14 | NMI | Non masked interrupt |
| A15 | CSROMCE | Enable ROM selection | B15 | HALT | CPU halt |
| A16 | RS | Switch ROM pages | B16 | MREQ | CPU memory request |
| A17 | | Not used | B17 | IORQ | CPU io request |
| A18 | | Not used | B18 | RD | CPU read data |
| A19 | BUSRQ | CPU bus request | B19 | WR | CPU write data |
| A20 | RES | Reset | B20 | | Not used |

| | | | | | |
|---|---|---|---|---|---|
| A21 | A7 | 7 address line of CPU | B21 | WAIT | CPU wait |
| A22 | A6 | 6 address line of CPU | B22 | | Not used |
| A23 | A5 | 5 address line of CPU | B23 | | Not used |
| A24 | A4 | 4 address line of CPU | B24 | M1 | M1 state of CPU |
| A25 | CSROM | ROM selected | B25 | RFSH | Refresh |
| A26 | BUSAK | CPU bus acknowledge | B26 | A8 | 8 address line of CPU |
| A27 | A9 | 9 address line of CPU | B27 | A10 | 10 address line of CPU |
| A28 | A11 | 11 address line of CPU | B28 | +5V | Power +5V |
| A29 | +5V | Power +5V | B29 | +12V | Power +12V |
| A30 | GND | Ground | B30 | GND | Ground |
| A31 | | On XS1: IORQGE2<br>On XS2: not used | B31 | | On XS1: IORQ2<br>On XS2: not used |

# 6 Installation ZX Evolution to miniITX/microATX/ATX case

ZX Evolution board designed for easy installing to miniITX, microATX or ATX case.

**Warning:** ZX Evolution not complected with brackets and fixates.

Steps:

1. Set CR2032 battery or compatible to GB1 holder on board.
2. Set board to cases frame. Set frame into case. Connectors (X21, X10, X7, X13, X6, XSD1, X11) must placed to “window” on rear side of case.
3. Connect cases power supply to PWR2.
4. Connect RES SW (from «Reset» button on case) to J9 (hard reset) on board.
5. Connect PWR SW (from «Power» button on case) to J6 (soft reset) on board.
6. Connect IDE LED (from «Ide» led on case) to VD3[3] on board (positive contact have square pad).
7. Connect PWR LED (from «Power» led on case) to VD6[4] on board (positive contact have square pad).
8. Set floppy drive(s)[5] into case, connect power supply to drive(s) and connect to X1 via ribbon cable.
   **Warning:** Ribbon cable of floppy drive not compatible with standard PC ribbon cable. Scheme of ribbon cable see in appendix.
9. Set IDE drive(s)[6] into case, connect power supply to drive(s) connect to X2 via ribbon cable.
   **Warning:** Installing two IDE drives may be only in master/slave mode.

Power supply controlled like PC realization:

| **Operation** | **Action** |
|---|---|
| Power ON<br>(for ATX power supply) | • Short briefly «soft reset» [J6] (PWR SW) or<br>• Short briefly «hard reset» [J9] (RES SW) |
| Power OFF<br>(for ATX power supply) | • Short «soft reset» [J6] (PWR SW) to 5 second duration |
| CPU reset | • Short briefly «soft reset» [J6] (PWR SW) |
| Full reset | • Short briefly «hard reset» [J9] (RES SW) |

3 If set contacts instead VD3 led on board (for example boards from NedoPC).
4 If set contacts instead VD6 led on board (for example boards from NedoPC).
5 Floppy drive is not mandatory, ZX Evolution work normally without it.
6 IDE drive is not mandatory, ZX Evolution work normally without it.

# 7 ZX Evolution firmwares

ZX Evolution content MCU ATMEGA128 and EPROM 29F040.

MCU ATMEGA128 is next functionality:

- Control peripheral devices, convert interfaces to ZX Spectrum standarts;
- Load configuration to EP1K50QC208 on power up or «hardware» reset of ZX Evolution;
- Update firmwares.

Firmware ATMEGA128 content two parts:

- **BOOTLOADER** – non-modified part for update or modify other firmware part of MCU (see documentation of bootloader[7]). This part flashed by special MCU-programmer device. You can update bootloader on new release only via special MCU-programmer device.
- **Configuration** – part, whose control peripheral devices and load EP1K50QC208. Some developers can to create different configurations. Exist service configuration for tuning and testing ZX Evolution board. Configurations stores in special file **zxevo_fw.bin** .

**Warning:** NedoPC support two configurations:

- **TEST&SERVICE** – configuration for tuning and testing ZX Evolution after soldering. This configuration can flash EPROM 29F040;
- **BASECONF** – base configuration. This configuration is base and example for ZX Evolution. Base configuration developed by NedoPC. Other developers can use source of base configuration like example for own configurations.

**Warning:** NedoPC not support configurations from other developers and not guaranteed correct functionality of ZX Evolution.

EPROM 29F040 content Z80 subprograms for working ZX Evolution in ZX Spectrum mode (Basic48, Basic128, TRDOS and etc). Flashing image stored in binary file **zxevo.rom (**size of image must correspond size of EPROM 29F040). Other developers may arrange of EPROMs content on own needs.

You can use **TEST&SERVICE** configuration for flashing or updating EPROM:

- Upload **TEST&SERVICE** configuration to ZX Evolution via **BOOTLOADER**;
- Copy **zxevo.rom** to SD memory card and set it on ZX Evolution;
- Select “update” menu in **TEST&SERVICE** configuration and flash EPROM;
- Upload working configuration (for example **BASECONF)** via **BOOTLOADER** to ZX Evolution.

**Warning:** NedoPC version of EPROM image based on E**VO RESET SERVICE**. This version of EPROM used in couple with **BASECONF** configuration from NedoPC. Updating new version **BASECONF** and EPROM image recommend in same time, cause new version of **BASECONF** may not work with old version of EPROM and vise verse. **EVO RESET SERVICE** can update EPROM in itself (see documentation).

7 http://www.nedopc.com/zxevo/rom/zxevo_firmware_update_eng.pdf

# 8 Appendix 1. Connecting display

ZX Evolution can to use two types of monitors:

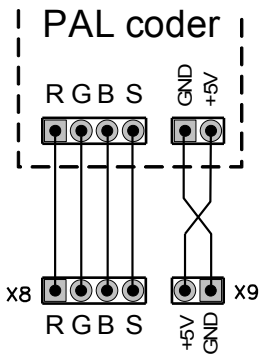
- VGA monitors;
- TV-monitors.

VGA monitors connect via VGA (X7) connector on ZX Evolution.

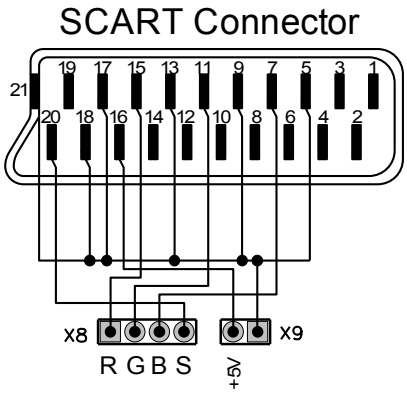
**Warning:** Switch VGA/TV mode of ZX Evolution by “Scroll Lock” keyboard button (If you use BASECONF firmware from NedoPC). “Scroll Lock” keyboards indicator light in VGA mode.

**Warning:** VGA monitor must support 48.8 Hz for using with ZX Evolution. List of supported monitors are in ZX Evolution project page[8].

ZX Evolution revision C content special connector (X8, X9) for RGB TV monitor. You can connect monitor via SCART-RGB connector on TV or via PAL-coder[9].




Connecting via PAL-coder require special cable like shown in scheme.




Connecting via SCART require special cable like shown in scheme.
**Warning:** TV monitor must support RGB mode in SCART.

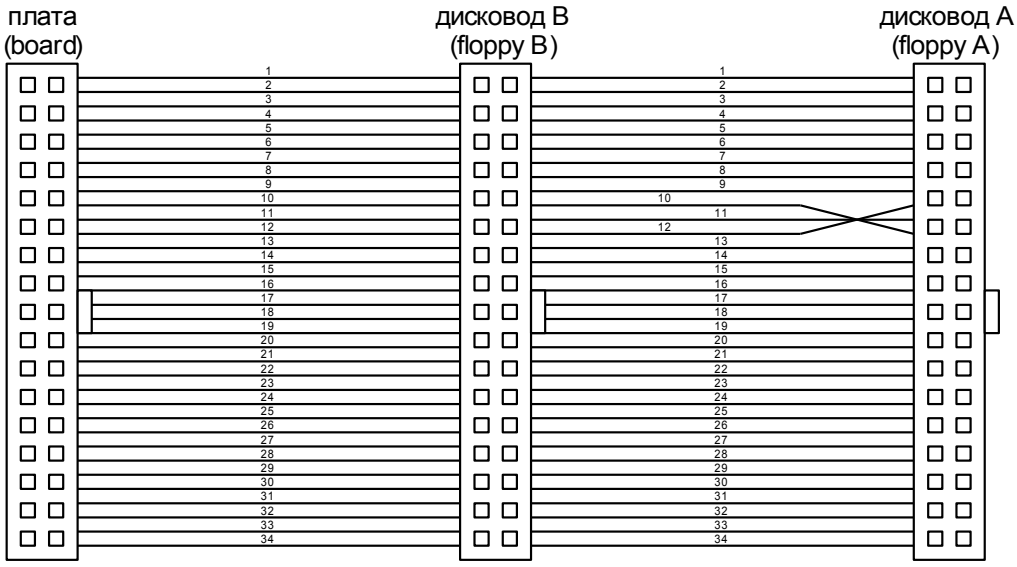
You can use VGA (X7) connector for connecting TV-monitors. You must short J2 and J3 for required signals (composite synchronization and +5V power) on X7 in this case.

8 http://www.nedopc.com/zxevo/zxevo_supported_monitors.pdf
9 http://www.nedopc.com/PALCODER/palcoder.php

# 9 Appendix 2. Floppy drive

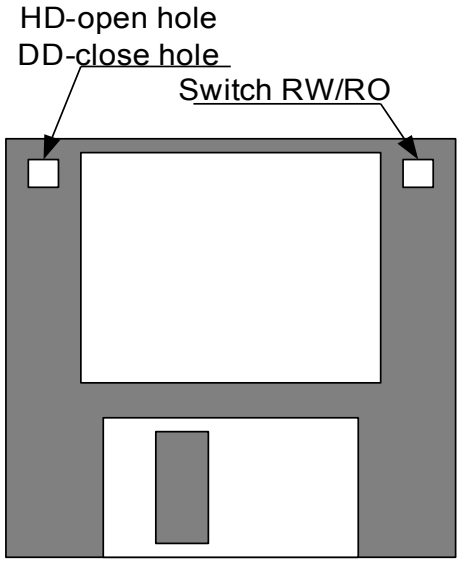
Floppy controller on ZX Evolution distinguish from PC controller in selecting drives method. Floppy controller based on WDC1793 support up to four floppy drives.

PC floppy drives is selected like “B” drive on ZX Evolution by default. For connecting two drives to ZX Evolution use special ribbon cable:




TRDOS use double density (DD) diskettes. Some modern floppy drives not support DD diskettes, it need to correcting hardware.

Close hole by non-transparent glue-tape on HD 3.5 diskettes for using it in DD mode (floppy drive detect it like double density diskette).



# 10 Appendix 3. Additional PS2 keyboard functions (only for “baseconf” configuration and “EVO reset service” ROM).

| **PS2 keyboard combination** | **Function** |
|---|---|
| “F12” | Soft reset. Equal to “soft reset” [J6] jumper on board.<br>Reset CPU only (without reconfiguration).<br>**Warning**: If “F12” pressed 5 second then power switch off (only for ATX power supply). |
| “Ctrl”+”Alt”+”Del” | Hard reset. Equal to “hard reset” [J9] jumper on board.<br>Reset and reconfiguration ZXEvo board. |
| “ScrollLock” | Switch VGA/TV mode for video out.<br>Keyboards led “ScrollLock” is light on VGA mode. |
| “PrintScreen” | Generate NMI (non-masked interrupt) to CPU. |
| “NumLock” | Switch tapeout/beeper mode for line out.<br>Keyboards led “NumLock” is light on tapeout mode. |
| left mouse button + right mouse button + numpad “*” | Reset mouse resolution to default value. |
| left mouse button + right mouse button + numpad “+” | Increase mouse resolution. |
| left mouse button + right mouse button + numpad “-” | Decrease mouse resolution. |
| ”0”(zero) + “F12” | (press “0”, press “F12”, unpress “F12”, unpress “0”)<br>Set ROM to “Evo service” mode. |