

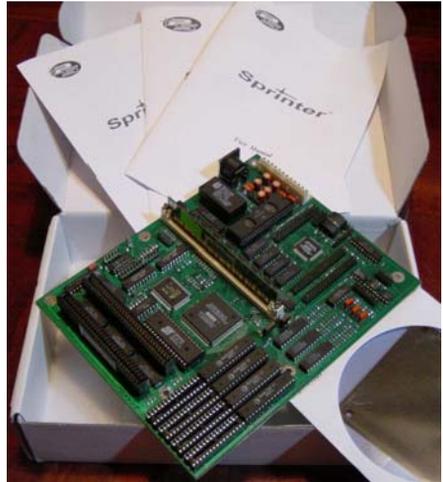
The machine that came from the cold

Sprinter™

Finally my Sprinter computer has arrived, and I won't pass up the opportunity to share my impressions with all Retro Review readers.

For the less connected people out there, the Sprinter is a computer made by Peters Plus (a company based in St. Petersburg, Russia) that has a "Flexible Architecture", meaning that it is not strained by hardware configuration but has a changeable architecture. The heart of this machine consists of 2 chips: the Z84C15 Zilog microprocessor and the Altera EP1K30QC208-3 PLD (Programmable Logic Device*). Besides these, it features an IDE disk interface with CDROM support, Floppy disk drive support, 4 MB of RAM, 64KB of FAST RAM, 256/512 KB of Video RAM, Stereo DAC, Real Time clock, 2 ISA Slots, Printer Interface and Analog Video output via RGB/SCART.

So whats so amazing about this machine ? Well, mainly its Flex Architecture! The PLD allows some hardware independence, that can be used to emulate (although emulation can not be the precise term) other machines like the ZX Spectrum, Pentagon, Scorpion and others that Peters is working on (ill reveal some news later in the article). This is all achieved by the Altera PLD... imagine the PLD like an Architecture emulator, a chamealeon chip that can take the form of many computer architectures; like the



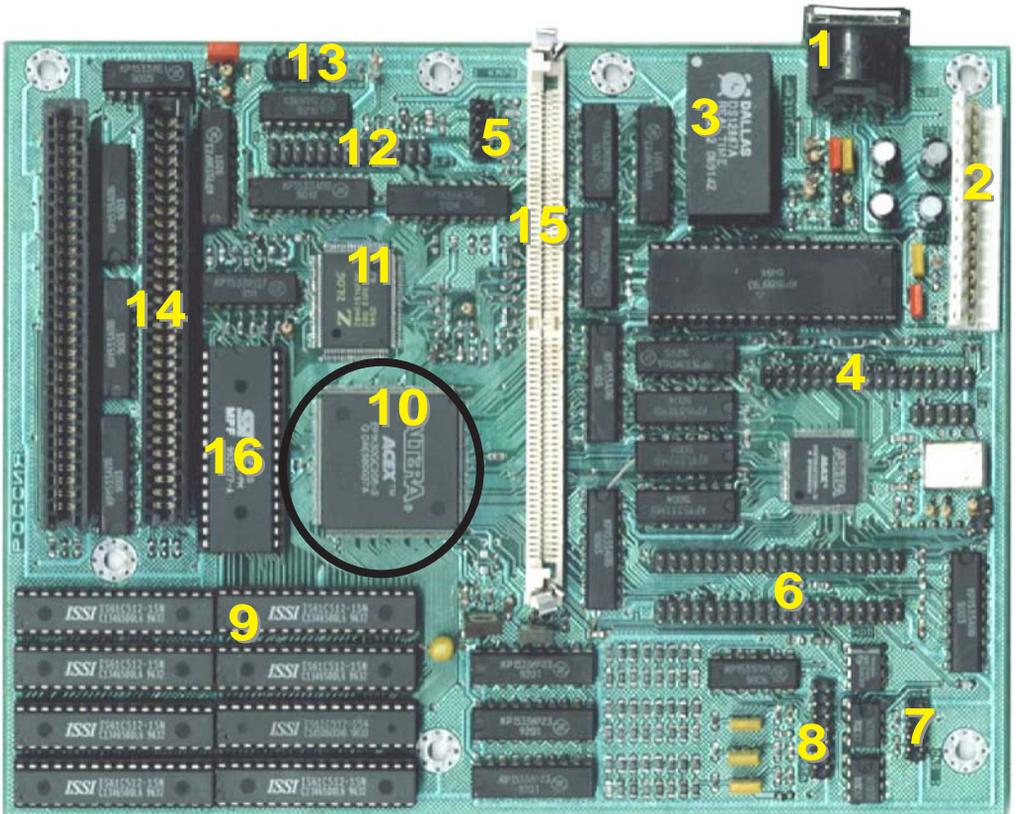
name says, a Logic device that can be programmed at our (read Peters) will. So, we take the Z84C15 (Z80) and transform the Altera into all other ZX Spectrum custom hardware, including the AY chip, and we have a fully working ZX Spectrum out of our Sprinter! Great eh?

The Sprinter is NOT a ZX SPECTRUM

One thing that Peters has asked us to put very clear is that the Sprinter is NOT a ZX Spectrum clone! It is a computer that can act as a Spectrum, so if you think you going to find a standard look micro computer, you are wrong! As soon as you open the box you will find a

motherboard, several cables and 3 user guides. The guides are small and lacking in information, but enough to get you going. You should start with the assembly guide that teaches you how to correctly set up your new computer; the other two guides cover the Sprinter system and OS and its ZX Spectrum mode.

The Board is well-built and shows some quality: no wires hanging around and wire jumpers patching design bugs, but it's funny to see so many chips (probably logic chips) in their Russian form. The board's Baby AT design fits perfectly in a standard PC AT case. A picture of the board is below.



TOP -The Sprinter board : 1) AT Keyboard Connector, 2) AT Power Connector, 3) Dallas Real Time Clock and CMOS, 4) Floppy Disk Connector, 5) Joystick / Tape Connector , 6) IDE Connectors, 7) Sound Connection, 8) Video Connector, 9)Video RAM, 10)Altera PLD, 11) CPU, 12) Printer Connector, 13) Mouse Connector, 14) 8bit ISA Slots, 15) SIMM RAM Connector, 16) Sprinters BIOS.

The Altera PLD is the heart of Sprinters FLEX architecture.

The Altera PLD:

In short terms a PLD is a Programable Logic chip, that can be programmed to make Logic circuits. This is what allows the Sprinter to be so 'Flexible': in theory almost any Z80-based machine can be 'made' from a Sprinter.

The Price is Great.

So start saving money to get one. Money, did I mention money? Well maybe you dont have to save that much! The Sprinter board retails at a fabulous \$115 USD, all you have to do is throw in your AT case, disk drive and HDD! This price is a really nice surprise: if you want to go for ZX Spectrum scene, I doubt you'll get a better deal than this.

SPRINTER DOS

Sprinter has a DOS of its own, but to be honest I find the DOS lacking in many features. The most noticeable is the lack of a FORMAT command, which in my opinion is the only really important thing lacking in ESTEX. Other things such as a simple type are not included in the DOS either (but have no fear! The Retro Review crew is developing some DOS commands: see the Archive section on our site <http://www.retroreview.com>). Redirection and pipes also don't exist on the Sprinter: you can't do a DIR >dir.txt. File management under DOS is also troublesome: no rm -r (or deltree for MS DOS users). Fortunately, there is a little application called FLEX

Navigator, (see pic below). This app reminds me of DiskMaster for the Amiga, or Midnight Commander under *nix machines. With it you can move large quantities of files. Please note that you have absolutely no control over the CDROM under DOS: there are 2 applications, for CDROM viewing and Music CD Playing. Flex Navigator also allows you to execute files from it, but you cannot archive files with it (there is the ZIP utility for sprinter).



Flex Navigator the file manager for sprinter computers

SPRINTER DEVELOPMENT

The Sprinter's CPU is a Z84C15, 100% compatible with the Z80, so Z80 assembler knowledge is very useful - specially as you don't have much more to choose from! Apart from Z80 assembly there is a FORTH compiler, so for now its easy to choose! I'm not exactly a FORTH fan but it's a powerful and simple language. The editor is also very simple: for the assembler part you can use MASM wich is in beta and has just been released. In my opinion the best tool for assembly for the Sprinter is using TASM on your PC to make the files! A development enviroment for the Sprinter is a MUST: the easier the software is to develop the more programs will be available; programs are a computer's life! There are plans to

make a C compiler for the Sprinter based on HISOFT C, this would be very welcome.

If you plan to develop using assembler, be sure to visit Peters Plus page often , and dont forget to download ESTEX function lists!

ZX Spectrum mode

Although Peters keeps saying that the Sprinter is a computer of its own and *not* a ZX Spectrum clone, it's obvious that one of the main attractions of the machine is its Spectrum mode. When you boot into Spectrum mode (either by skipping DOS loading or by typing SPECTRUM on the command prompt) you will be presented with a TR-DOS Spectrum screen. Sprinter supports all functions from TRDOS (you still can't format a floppy from here) and adds commands of its own. These new TR-DOS commands are here to take advantage of Sprinter's hardware improvements, such as large RAM, HDD etc..

The ZX Spectrum menus are of course different from the real Speccy ones. The most noteworthy is the "Hardware" menu that gives you access to the hardware selection list. Here you can choose what Spectrum model/clone is 'emulated' - you can choose from Sprinter ZX, ZX Spectrum, Pentagon 128, Scorpion 256 and Pentagon 512. The machines are almost perfectly emulated (note i say almost because Peters says that it is 99% compatible! for what I tried it all worked well and I found a 100% program compatability). Another intersting menu is the options menu: here you can swich the Turbo On and Off. It's worth noting that although the Sprinter runs at 21MHz, owing to slower memory speed, the Sprinter



Fatality intro from Quadrax game

actually runs at about 10 MHz! So, Spectrum games and applications are NOT 7 times faster! Most demos don't show any speed improvement due to the fact that they are synced with the ULA timings and screen drawing routines.

There are 2 ways of getting your Sprinter to load spectrum software: either by TRD images, (which can be found on the web or made using an emulator that supports the format), or by the use of a sound cable that Peters do not include. Having said that, once you get a grip on TRD images I doubt you'll want anything else.

Something I think the Sprinter lacks in Spectrum mode is a sort of Multiface-like magic button (see box-out on next page). It would be very useful for tape loaded programs to be saved into TRD.

DOOM

One of the first things a new Sprinter owner will notice on his CD (well, CD-R actually - the production run *is* rather small!) is an intriguing directory called "DOOM". Sure enough, once you've actually got the directory onto your Sprinter's hard disk (which is no mean feat considering it's 14MB and you can't copy from the CD-ROM - most people use a PC but I wrote a split/join program

- check the archive section of our website for more details!), running the program comes up with what appears to be Doom - almost!

In fact it's a technology demo.. you can run around the specially-designed map, at about 10 frames per second, and shoot, and see monsters - but the monsters don't move or anything. But it does demonstrate the hardware zooming of the machine, to achieve a frame rate which really isn't bad on an 8-bit machine! I can't imagine it'll ever become a full game as it's take a lot of work to fit all Doom into 16K chunks of RAM, but nonetheless it shows what the architecture is capable of.

In the right hands, there's nothing to stop a 3D Doom-like game appearing, but I think the Sprinter users are more likely to be into Space Invaders in terms of games - and probably own at least one PC to play Doom on anyway- but it's still good to see that it can be done

Future Plans...

As you've probably noticed by now, the Sprinter is a very young machine. There isn't much software for it, but things are changing rapidly: many things are planned for the Sprinter, and a lot more appear every month. Among several other things, Peters Plus is planning (and making a poll of right now on their Forum) CP/M implementation for the Sprinter. Applications are being ported to the Sprinter too: MASM80 is here, Hisoft C is Planned and many other things are already being considered. One of the most exciting things I've heard is MSX emulation! That would be just great: Peters has told me that its being looked at, and, possibly will be subject to a poll in Peters Plus Home Page, so if you are a MSX fan keep looking! Your vote will be important when it comes to make the decision.

A great place to express your opinions is Peters Plus Forum on their webpage. Peters is very democratic when it comes to developing.

In Conclusion

The Sprinter lacks software of its own, but on the other hand has thousands of ZX Spectrum programs that can be used on it. Plus, Peters is developing in a very good rhythm: just take a look at their page (<http://www.petersplus.com>) and you will notice the fast growing rate of additions to the site. Furthermore when Peters completes the MSX mode another bunch of software will arrive and MSX games tend to be very good indeed (check the Penguin Adventure review last issue).

Peters Plus Support is one of the best I ever seen: they don't leave a question unanswered, and are extremely helpful with any problem you can find.

Finally your machine does not have the risk of being outdated by a later Sprinter model very soon, as Peters will make many of their upgrades software only (remember the heart of the Sprinter is the Altera PLD).

In my opinion this machine is indispensable for any Retro Fan, it really takes me back to when computing was actually fun!

Jorge Canelhas / Ian Gledhill

How to Buy a Sprinter

So, you liked it ?

You want to get one for yourself ?

Buying a Sprinter is easy, just go to Peters Plus homepage, and send a mail to them. They will give you precise instructions on how to order - the main problem when ordering one is P&P price, as there are still no retailers or distributors of the computer. I believe thats about to change, but for now, just type <http://www.petersplus.com> on your browser and send an email.

What rocks :

- The concept, the machine is great for flexibility and Power.
- The price, it's very cheap.
- ZX Spectrum emulation.

What sucks :

- The DOS, still very immature.

The SCORE 95%

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