The Lynx: pause for thought

***Tim Langdell** presents the first review of the 48K Lynx from Camputers – a low cost micro that is equally at home in the house or the office.*

The 48K Lynx.

At £225, the Lynx from Camputers of Cambridge promises to be one of the most exciting new micros to arrive on the scene this year. It offers 48K of Ram as standard, expandable almost without limit in 64K blocks, and 32K of video memory (leaving 16K of workspace) expandable to 64K for even higher resolution graphics. Its Basic is among the most advanced available, and its potential for future expansion is among the best there is.

The heart of the Lynx is a Z80A CPU as used in the Spectrum, ZX81, early Tandy machines and the Research Machines 380Z. The Z80A is probably the most advanced 8-bit CPU presently available (although lovers of the 6809 may argue differently). It has a well-structured machine language which makes the design of a sophisticated micro relatively easy compared with the less sophisticated 6502 chip (as used on the BBC machines for instance). However, using the Z80A with more advanced high-resolution colour micros can lead to problems with screen handling — but more of that later.

The Lynx comes with 48K of Ram and 16K of Rom. Of the 48K Ram, 32K is used as video Ram allowing a bit-addressable high-resolution graphic display of 248 by 256. The eight available colours are bit-addressable, too. Thus the Lynx can put all eight colours in a single character square, unlike its nearest rivals the Spectrum or the Dragon 32. The text is 40 columns by 24 rows and is thus teletext compatible — again unlike the Dragon or the Spectrum.

The Ram can be extended indefinitely in banks of 64K, much as the NewBrain can be. Being Z80A based and capable of such Ram upgrade, the Lynx is able to run CPM TM, unlike all other micros in this price range. Although the video memory is standard at 32K, it can be upgraded to 64K by a very simple modification, giving 80-column text display instead of the regular 40-column version. The potential for the business market is clear. Moreover, a disc drive card which plugs inside the casing will become available soon. It has an RS232 interface as standard, and a parallel interface is an integral part of the disc card.

What Camputer's programming expert, Davis Jansons, has managed to cram into the 16K of Rom in the Lynx is quite incredible. He has created a new Basic with similarities to Microsoft, BBC Basic and Sinclair Basic, too. The Lynx's Basic is structured as the BBC machine's is — with *Procedures, If-Then-Else,* and so on — but goes further than the BBC by having *While* and *Wend*, too.

John Shirreff and Davis Jansons.

Davis has made the entry of machine code from Basic a superbly easy task for the more serious programmer. The keyword *Code* has been included to indicate that what follows are *Hex* bytes of machine code. The keyword *Call* then enables the user to call the machine code routine from Basic and *Lctn* xxx allows the user to indicate that the machine code routine is in line number xxx. All of which adds up to an extremely useful tool.

The more usual Basic keywords are, of course, also there, with many enhancements. For instance, as well as offering *Goto* and *Gosub,* the Lynx offers *Goto Label* and *Gosub Label* which allows the user to give a subroutine or part of a program a label rather than refer to it by its starting line number. The Spectrum also effectively supports such a facility because it will allow numeric variables to have full names. However, the Lynx, while only allowing single character variables, does offer a more obviously structured Basic.

The attention given to making programs clear, easy to read and write, is laudable. Camputers has even made the Lynx's listings indented, with *For-Next* loops being more indented than other statements, and so on. While this feature is possible on the BBC machines, too, it is a relief not to have to type in additional commands to achieve this useful feature.

In brief, then, the Lynx's Basic is superbly complete, offering many luxuries such as auto line numbering, deletion of line num-

The Lynx.

bers, direct entry to the monitor *(Mon)*, renumber, and even a keyword *Ext* which allows the user to add extra Basic keywords called from Ram or stored on Eproms or Roms.

Davis Jansens has aimed to make Lynx Basic among the fastest around. While no 'bench test' type figures are available yet, running many standard tests of speed on the Lynx puts it in a class alongside the BBC machines.

However, while the Lynx Basic's speed of execution is fast, its screen handling is rather slow. This seems to be due to the inherent problem of screen handling with a Z80A when high resolution colour and graphics are being supported. When displaying to the screen, the Lynx seems to be several orders of magnitude slower than machines using the 6502 (such as the BBC) or the 6809 (such as the Dragon). This is a great pity, given that the availability of colour definition at the pixel level makes the writing of colourful games very tempting — without recourse to good machine code writing though, fast-moving games on the Lynx may not be possible.

This said, there is no other micro for its price (except perhaps the recent MPF2 from Multitech) that allows true high resolution colour. The Lynx also has many built-in graphics commands such as *Draw, Move, Plot, Paint, Ink* and *Paper* (at least some of Sinclair Basic has caught on). The Lynx also offers a *Window* facility, enabling the user to define a text window within the normal screen area — much as the BBC machines do.

Autorun

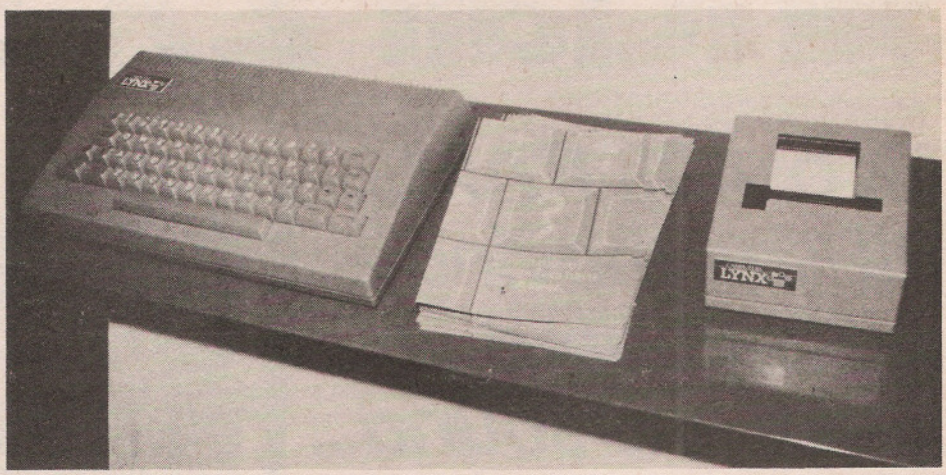
As with the ZX Spectrum, programs can be *Saved* to tape followed by both a name and *Line* which causes the program to autorun upon *Loading*. Unlike the Spectrum, though, the Lynx makes it easy to have *Appended* (ie *Merged*) programs autorun, too.

Other non-standard features also, are rather nice. For instance, the Lynx has an immediate calculator mode where you simply type in the numbers, eg 4*65, no keywords such as *Print* being necessary.

Whereas you would normally type in a program in full on the Lynx, as with most machines, it is also possible to have Spectrum-like single-key entry of just about every command. Simply press the *Escape* key along with any of the main keyboard keys. This feature is excellent, and once again shows the great deal of thought that has gone into the Lynx.

The keyboard also deserves a mention, as does its general appearance. The keyboard is among the best I have used on a micro — standing alongside the BBC machine as my favourite for touch-typing. The quality seems up to the standard of many word processors at least. The casing of the Lynx is both functional and elegant — the sort of design which would be equally suited to the home as to the office.

The room for expansion of this machine is very good indeed. A 5¼in disc drive should be available soon, and a 40-way bus at the rear of the machine brings out most of the connections necessary for hardware additions. The Lynx comes standard with rgb+sync, composite video and pal outputs all available from sockets at the back.

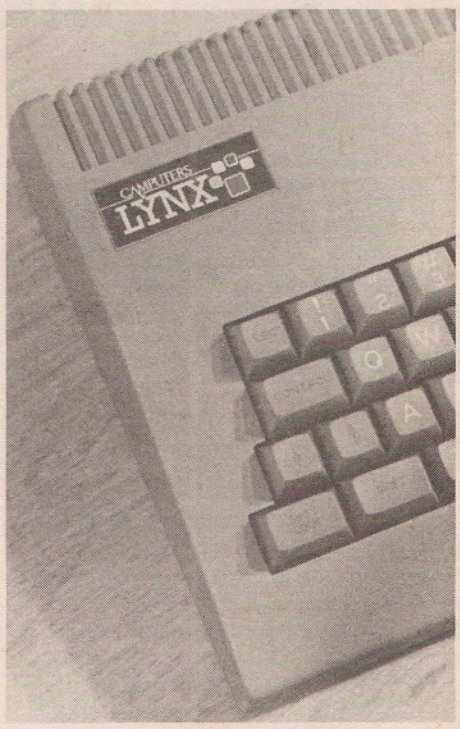


Lynx computer and printer.

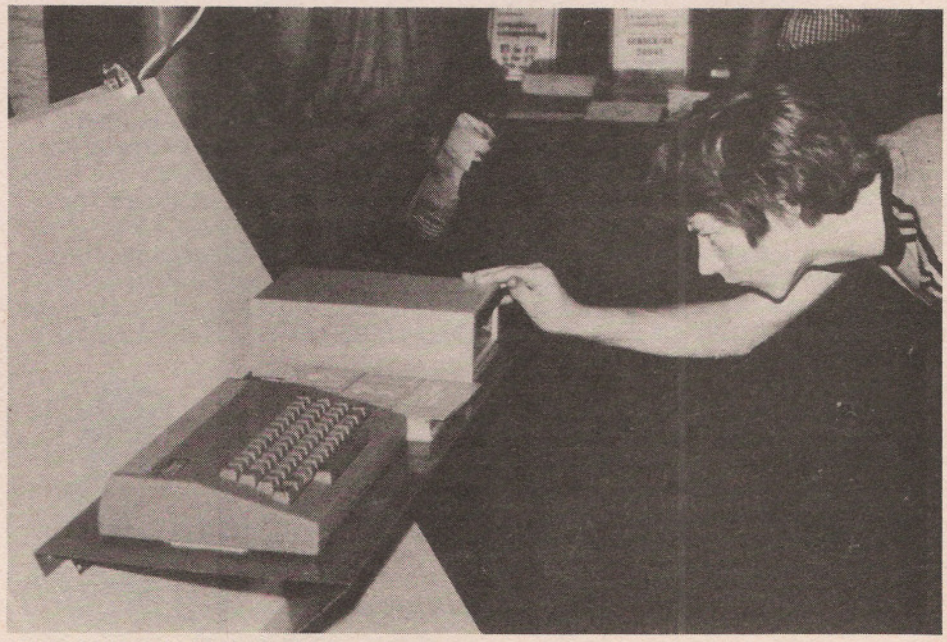
In conclusion, Lynx seems to have struck a very good middle ground in trying to please the serious user, the first time buyer of a home computer, and the small business user. In many ways the Lynx must rival micros costing at least twice as much (such as the BBC model B and new SuperBrain) in the business sector, as well as offering extremely strong competition to micros in the £175 to £225 region such as the Dragon 32, the Vic and the 48K Spectrum.

The Lynx is perhaps less well equipped than some others in the market for games playing (the screen handling is slow, and there is no ready provision for joysticks or plug-in Roms), but it does offer a full eight colours in true high resolution which no other similar-priced micro can offer.

All in all, the Lynx is excellent value at £225 for the standard 48K version.



Computers' Lynx.



Taking a closer look at the Lynx.