

Comprehensive Review of the Nokia 770 Internet Tablet

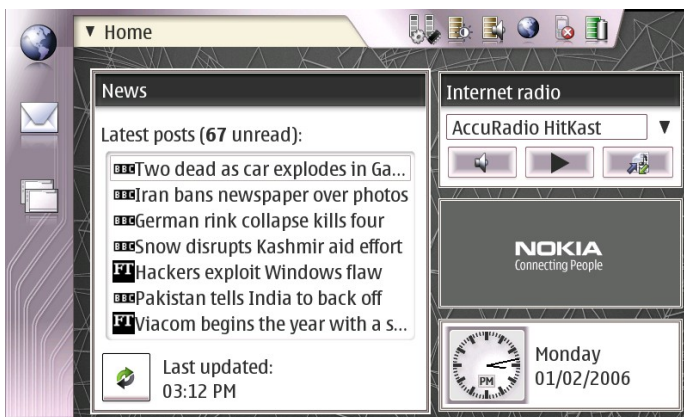


The 770, sitting on the included stand, with the reversible, hard cover next to it and a dollar bill (for scale).

Introduction

So what is the Nokia 770? Is it a tablet computer? A PDA? An Internet appliance? An E-Book reader? An MP3 player? Well, it has aspects of all of those devices and more. However, it is marketed as a convenient, wireless, web browsing appliance. As you will soon see, you can do much more than that with it...

The entry price was targeted at \$400, but quickly dropped to \$350. This puts the device right in the range of a mid/higher end PDA. The target audience is for people who want to quickly jump on the web to research something, without having to go to a larger machine or laptop. The 770 extends the convenience of the net and allows access to the net even when your other machine might be tied up by someone else.



The main screen of the 770, showing the news feeds, radio station, time, and toolbar

One of the first impressions a new owner will get is the feeling of quality and style. The sleek unit is very pocketable and the built-in brushed metal front cover can be stored on the back of the unit. They even include a fabric cover, although I doubt most people would ever use it.

The screen is very sharp, has excellent contrast and is also quite bright. The controls are intuitive and mostly well-placed. The “zoom” and “full screen” buttons are especially handy.

Hardware & Specs

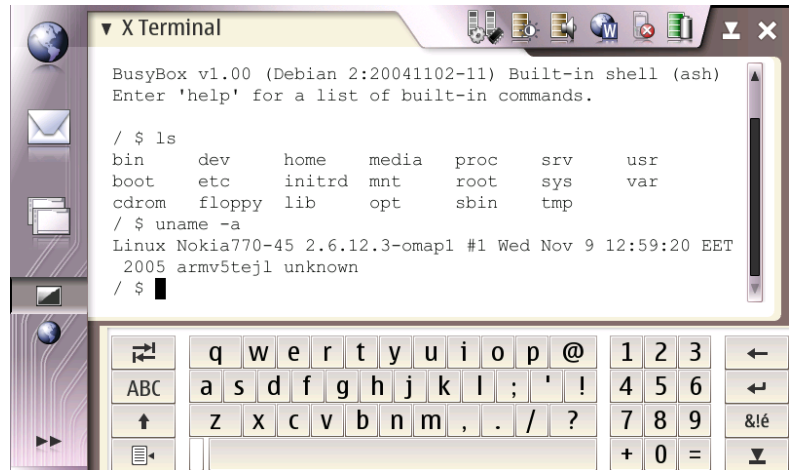
The 770 is an 8 ounce 5.5” x 3.1” x 0.7” rectangular device with a high-resolution (800x480), 65K color, backlit, 4 1/8” diagonal touch screen. The included stylus slides into a channel in the right side of the unit. The 770 uses a 220-MHz, ARM9-based Texas Instruments (TI) OMAP 1710 processor, 64MB DDR RAM, with 128MB flash memory built in (64MB free for the user). There is a “reduced size” MMC card slot for expansion and includes a 64MB card. The included card comes with an adapter to use it in a standard MMC/SD slot, too.

The standard Li-ion BP-5L battery is 1500 mAh allowing more than 3 hours of intense web browsing with 7 days standby. It is one of the same batteries used in Nokia phones, so replacement will be cheap and easy. There is a door on the back of the unit

for battery access. The included charger has a micro barrel plug which plugs into the bottom of the 770. Also on the bottom is the standard stereo headset jack, and mini-usb port. Nokia was nice enough to include a spare stylus and a small desk-stand, too.

Linux to the Rescue

Of course, one the best qualities of the 770 is that it runs Linux. “Maemo” to be more precise, a Linux distro and application development environment, based on Debian. It is a 2.6 kernel with Gnome based GUI. See www.maemo.org for more information. Nokia plans to use Linux in all their upcoming devices and phones. The 770 is also Nokia's first non-phone device. In some ways it is similar to the Sharp Zarus, but with much more style. Nokia calls this environment “Internet Tablet 2005 Software Edition” and almost seems to be scared to mention the word “Linux” on the website, or any other marketing materials.



Bash running under an Xterm, showing the on-screen keyboard

Imagine my surprise when I downloaded and installed “xterm” and “bash” and was greeted with a shell prompt! Yes folks, Linux is really inside. Don't expect to become “root”, though, unless you reflash the 770 with a development version of the OS, which is available on-line. Installing applications doesn't require root access, however.

Networking

Included inside the tiny 770 is a radio that can not only communicate with 801.11 b/g but also bluetooth. Setting up to connect to a wifi network is a snap and the bluetooth is mostly used to connect to phones to gain internet access that way. I found that the range of the device is excellent and comparable to any wifi laptop/notebook computer.

Basic network connections for web browsing are one thing, but what Linux user can survive without ssh? No problem! After downloading “dropbear”, I could ssh (text-only) and scp files. I could even ssh/scp INTO the 770 from my desktop. Not impressed yet? How about a vnc client? In no time, I was connected to my Linux desktop machine (running x0rfbserver) and controlling/viewing the screen! Although not speedy, it was quite usable. The possibilities are many.

Controls and Text Entry

The 770 uses a unique window manager to make operation simpler with the limited screen space. Since it uses a touch screen, most entry is via intuitive, screen-touching and dragging. Click on any place that requires text entry gives the user a choice of using handwriting recognition or an on-screen keyboard. Both work well. In addition to hard (non-screen) home, reload, menu, zoom (+/-), power, and full-screen buttons, there is a five-way navigation button.

Since the USB port is non-powered, plugging in a USB keyboard is not directly possible, unless it is self-powered. There are mods available for such a purpose. Plus, there is already FOSS support for bluetooth keyboards.



Web browser with the all-important Slashdot.com loaded

Web Browsing

Web browsing is the “main purpose” of the 770, and it seems to do it quite well. Using the included, modified Opera browser (called OSSO), the user can view the majority of the web with ease. Things like Javascript, Frames, and even Flash do not pose a problem. The browser includes all the expected features, including bookmarks, reloading, find, reformatting to fit the screen better, history, cookie control, and even

optional (additional) plugins. And if you want a different browser experience, other browsers are already starting to appear on the Internet for the 770.

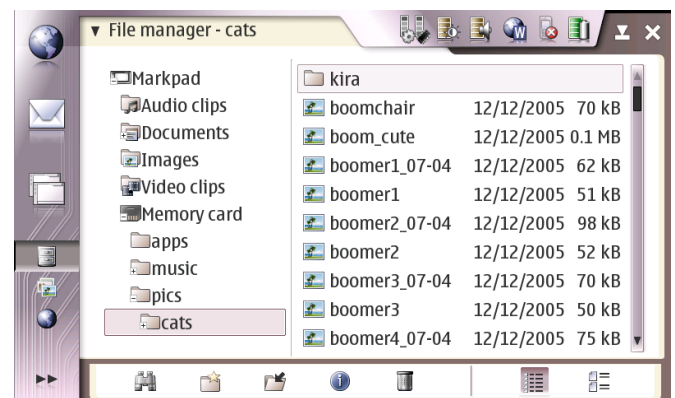
In addition to HTML, you can use the 770 to read PDF's with the included application. Install the fantastic “fbreader” program from the net and you can read Ebooks too.

File Transfer and Storage

File transfer to the Nokia 770 couldn't possibly be any easier! The included 64MB RS-MMC card can be used in other devices for direct file transfer. When you insert the card into the 770 and then plug it into another machine (using the included USB cable), it is immediately recognized as a USB mass storage device. Simply copy over any type of media file or application, unmount it, unplug the cable, and you are done.

Installing applications is a snap- download the “.deb” package file, transfer it to the SD card, then use a utility on the 770 to “install” the application from the card into the unit's own flash memory.

I was unable to access the built-in flash memory via USB, but this might be intentional, and I am sure there are ways to do it for those so inclined. Although I was initially disappointed by what appeared to be “yet another flash card standard”, I discovered there are plenty of sources for the RS-SD cards. It is easy enough to find them- without much effort, I located 128MB cards on Ebay for \$17, including shipping and name-brand 1GB cards for around \$70.

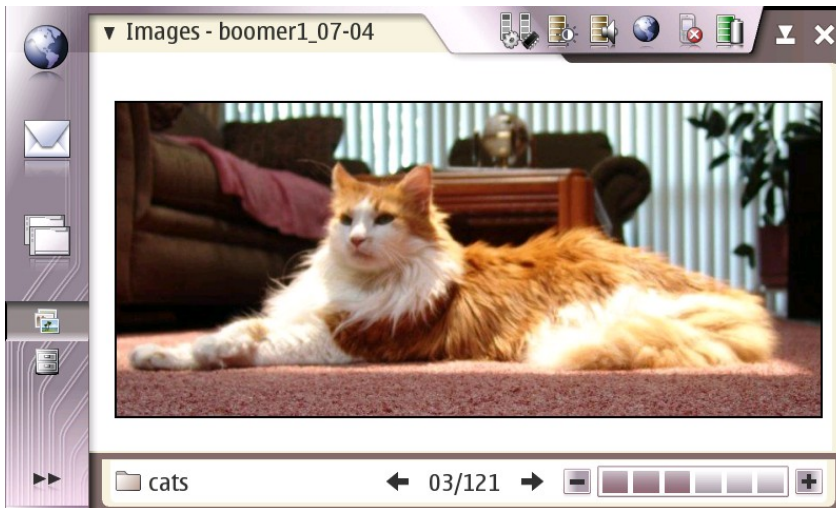


What GUI would be complete without a file manager?

Multimedia

Nokia includes an internet radio application, so you can listen to music right away using the surprisingly powerful (although non-hi-fi) built-in speaker. Plug in a set of good

headphones for a whole different experience. The sound quality was most unexpected- I tried numerous MP3 files with very good results. Although using the application is not as easy as an Ipod (nor is the 770 as small or light), it is a suitable replacement when you only want to carry one device. It will also play MPEG4, AAC, WAV, AMR, MP2 files (OGG is an option if you install your own application). Don't like the built-in player? Then install the standard Gnome "Rhythmbox" from the 'net as an alternative.



The 770 is the best portable picture viewing platform thanks to it's high resolution and clarity. Zoom, rotate, and at the touch of a button, go full-screen.

The picture viewing application supports PEG, GIF, BMP, TIFF, PNG, Animated GIF format, SVG-tiny, and ICO files. The quality and resolution of the screen makes viewing photos a pleasure- far better than any Palm or Pocket-PC I have ever used.

Nokia also included a movie/video player and a pre-loaded movie trailer. Here, the limited CPU starts to show, although it can keep up with most video in windowed-mode, full-screen video is choppy, although tolerable. Hopefully the next revision of the software will address this shortcoming. It can play MPEG1, MPEG4, Real Video, H.263, AVI, and 3GP files. I tried to encode my own (using mencoder on my desktop), but didn't have much success. Still, with some effort, one should be able to fit a full 2-hour movie onto a single 1GB card.

Gaming

A Sony Playstation Portable this unit is not. It simply doesn't have the necessary controls or graphics CPU to handle modern, high-quality, real-time gaming. But the 770 can hold its own when compared to a Palm or Pocket-PC. Nokia included three games- chess, mahjong, and marbles (sokobon'ish). All three work quite well, although I was surprised Nokia didn't include the ever-standard solitaire game.

If you have need for more games, you can install an ever-increasing number of them from the Internet, such as: Doom,



Mahjong on the 770 in full-screen mode. Not a PSP, but fun, nevertheless. The 770 includes three games.

MammaSnake, Crimson Fields, Bomberman, Crazy Parking, Nako, Battlegweled, Blocks, Drac, Swap (minesweeper), Icebreaker, Xtris, Nethack, and many more. Some are higher quality than others, all are free and open-source.

Other Applications

As one would expect, in addition to what has been mentioned already, the 770 includes a calculator, clock, sketchpad, text editor, and control panel. The file manager is handy, too. Also included- an RSS newsreader and an Email client. There is even a tool to help make a backup of your data, which is always a good idea.



This is a shot of the 770 acting as a remote control for my house, through an internal website I designed using X10 and other controls.

The Future

One of the best things about the 770 is the open-source platform. There is a lot of interest in the FOSS community and so improvements and add-ons to the 770 are almost guaranteed. Nokia will be releasing a whole new version of the firmware/OS early in 2006, which promises to add more features and fix known bugs. Another interesting target of Nokia's is to support VOIP (Internet Phone) using bluetooth headsets (note that Nokia doesn't claim it to have a microphone).

Problems and Suggestions for Improvement

As with any device, there can always be improvements. This is a rather long list of things I think would greatly improve the user experience with the 770.

Probably the biggest flaw of the 770 is the lack of RAM. If you open more than a few applications at the same time, you are likely going to be greeted by the "low memory" dialog. It seems almost inexcusable that a device in late 2005/early 2006 would be limited to only 64MB. Most users would gladly have paid \$10 more for 128MB, which would make the 770 much more usable. Already people are hacking ways to use the flash card as "swap space", but it seems like a senseless limitation in the design. It also seems you cannot store applications on the external flash card, only on the internal flash memory... when you run out, oh well!

Although the CPU is weak, it should be possible to play full motion video at full resolution without choppiness or dropped frames.

There is a lack of "processing" or "busy" icons, so sometimes you don't know if the 770 is busy, if you didn't click on what you thought you did, or if something is wrong.

Personal Information Management (PIM) software. The 770 market is for a portable web viewer, but if it had a personal information manager, then it really could be a PDA. As shipped, there is nothing to store contacts or a schedule.

The nav button should be used to scroll through pages like a scroll wheel. Most people reading stuff want to hold it with one hand (left) and read, not have to use the right hand to scroll. This could be done with one hand, if there were an option to scroll with the nav. Currently, the nav is used on web pages to jump from link to link.

Applications should be loadable-on-demand from external flash and removable from RAM back to external flash. Although it might be slower, it would allow the user to have an unlimited number of applications.

I would like to see a built-in IRC client and instant messaging client (think GAIM). One is already in the works from FOSS developers on the internet.

Nokia should have included a few more pre-loaded internet radio station links. Oh, and not treat internet radio stations like they are song files which can be confusing.

Hardware wishes- IR port to use as a universal remote. More and expandable RAM. Perhaps an even larger screen (keep the case the same size, expand to the top and right). Ports on the side, not the bottom so it can sit in the stand better. Ability to remove/insert the stylus without removing the slid-on back cover. Addition of a microphone for recording. Ability to use the left function of the nav button with the back slide cover on. Scroll wheel in place of one of the other buttons. Hard/dedicated volume control (not software/screen driven).

Conclusion

The 770 is an impressive, sleek, and innovative piece of equipment. Although I wouldn't rate it as a "must have", quite yet, it can be very useful and certainly fun. Nokia did a superb job for their first foray into the non-phone world of electronics. The lack of CPU hurts its ability to replace a portable video or modern game playing device (although that might be improved soon). The open nature of the platform ensures lots of hacking, fiddling, and add-ons from the the OSS community. Linux geeks will have much to explore.

As marketed, it "fits the bill" perfectly- doing everything as promised, and more. And, yet, it is easy to envision a "next generation" 770 with twice the CPU, and much more memory... maybe even a camera and mic, that will simply blow-away a multitude of portable devices (camera, mp3 player, portable video, IP phone, PDA, gaming machine, radio, recorder, etc) and make it a truly convergent, "must-have" product.

Sites of Interest

www.nokiausa.com/770
www.nokia770.com
www.maemo.org
www.internettablettalk.com
only.mawhrin.net/fbreader

-Mark A. Davis ver 1.1

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