NeXT Users' Journal

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Contributors

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Content and Layout for this issue by Erica Liebman. Final edit by Jon Bennett.

Welcome

Jon Bennett
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As you probably noticed, I am not the usual author of the welcome. As the Hitchikers Guide To The Galaxy would say:"Don't Panic". Erica is fine. I saw her a few days ago and she seems to be working perfectly. Her poor computer (Whimsy T. NeXT) is doing "O.K." and we got uucp working so that it may call my own *dkstar*. What a boon this will be when I go to let her review this newsletter. Erica is swamped with work related to her education and as such has pawned the NUJ off on me this time. I don't know how many I will be editing and compiling but it will almost certainly include this one and possibly the next$_{npi}$. If you have any comments about this edition and a new (albehim temporary) editor please feel free to call me and leave your comments. My number is (404)339-4776. NeXT mail is also welcome at my machine. The nice thing about editing a news letter is that I don't get edited. My part is to rant and rave. To ravish the soap box without concern. To get everyone to see why the NeXT is the one true computer. Enough explanation. I hope to make my editions of the NUJ as informative and enjoyable as Erica has made hers although the format may be slightly different. I am also sorry about the Time Warp. NUJ #13 was to be the Feuruary/March issue. It is so late that I thought I might warp now and avoid having NUJ #14 already late when I start it.

EDITORIAL GUIDELINES

Erica Liebman

The NeXT Users' Journal is looking for incisive, intelligent articles focusing on how-to, review and about NeXT technical issues. Our readership primarily consists of developers (academic, commercial and government) who are sophisticated programmers. Code is always cheerfully welcomed and highly desired.
Please copy-edit your piece as much as possible and post to *erica@kong.gatech.edu*.

You may also mail or phone
Erica Liebman
1150 Collier Road NW L-12
Atlanta, GA 30318
(404) 352-5551
(Calls between 10AM and 10PM only, please indicate if you can be called back collect).

If you wish to have your software/book/etc reviewed, please contact me at the above address or phone number. We will make every effort to get your review into the next issue.

If you have software we at NUJ could make use of and would be kind enough to donate a copy, again send to the above address. Your contribution will be duly noted as loudly as possible in as many issues as possible.

Please see the NeXT Users' Journal Manifesto article about advertising, author rewards, subscriptions by mail and so forth.

Submission Guide for Articles

1. Start with Title, Subtitle (if included) and Author each on a separate line. Author contact information including phone, address and e-mail should be included on separate lines below author name and may be repeated in greater detail with an author bio at the end of the article.
2. Include carriage returns only at the end of paragraphs.
3. Please submit articles in WriteNow, Rich-Text or ASCII format for now.
4. Avoid passive voice. Please spellcheck. Please copy-proof before submitting.
5. Send articles to erica@kong.gatech.edu. If you do not get an "Acknowledgement" or "ACK" back within seven days, please call or resubmit.

FEEDBACK from the TRENCHES

Letters, Hints and Other Fun

Hello Erica,

It was a very pleasant surprise to hear of Issue #12 of NUJ, which I have since grabbed off the Purdue site and enjoyed reading. It's a particularly good issue, and I'm happy to learn that NUJ is very much alive. I was afraid that after the introduction of NeXTWorld you might discontinue NUJ. This would have been unfortunate, since the kind of concrete, programming- oriented information that you include in the journal is nowhere to be found--so far at least--in NeXTWorld. The two publications complement each other and NeXTWorld does not constitute a replacement for NUJ.

Thanks for the article on image processing. This is something that I had plans to explore, and now I have an excellent map to take along on the trip. A big help for me, and I expect for many others as well.

David Carpenter St. Joseph's University Philadelphia, PA 19131

Erica,

Nice to see NUJ #12. As I've mentioned before, I do prefer the WriteNow format, and the 12 point fonts are a welcome change, since I read NUJ on screen (at 72 pages, NUJ #12 could do in a good bit of a tree if I printed it).

And as for asking people to use spellcheck, the very first page of NUJ #12 lists the "Contributers".

I started to read a letter in NUJ #12 and got a couple o' few paragraphs into it before I realized it was mine! I mention in the letter that my screen was dim and had a flickering problem. Well, it got worse, and it was suggested by someone else on the net (whose name I've long forgotten, but whose help I won't) to call Paula Lorenz at NeXT. I did, and she told me to bring in my MegaPixel to our campus service dude, and have him call her. I did, and he did, and my MegaPixel was replaced at no charge. I now have a happy, bright monitor.

This was around the middle of December.

The really astounding thing about this is that my one year warranty had expired around the beginning of September! This is the sort of thing that will keep me a loyal customer of NeXT.

Speaking of loyal customers, I had ordered the 68040 upgrade the beginning of last June, shortly after it was announced, plunking down the $1092.50 then. At the time, a mythical chip on a mythical board. They gave some estimate at the time as to when I might get it, but I didn't believe it, and so promptly forgot the estimate (I think it was something silly like September). Anyway, I figured that as soon as them 68040's came in, I'd be one of the first to get one. Wrong. There were many reports of upgrade boards on the net from people who had ordered after me, lots of slabs ordered after me, then the slabs hit my campus, and to top it all off, someone who ordered their upgrade after me on my own campus got theirs. Mine was nowhere to be seen.

Finally, almost two weeks later, mine shows up. At the end of January. I have to admit, I really like the thing (except for the floating point problems, but I'll write about those if and when they are or are not resolved), and it was worth the wait. But, I don't think that it's very business-like to handle orders like a stack instead of a queue. And it's certainly no way to treat someone with enough faith in the company to plunk down that kind of money for a product several months in the future.

A few more random notes:

I ordered a used NeXT laser printer from BusinessLand (Norm Gilbert at (408)437-2623) for $1200 on 22 Jan. Haven't got it yet. (It's 18 Feb.) They're real busy pumping out used cubes, but testing a printer shouldn't take nearly as long ...

I bought eight 1Mx8 SIMM's from Peripheral Outlet ((800)332-6581) for $40.50 each plus $8 overnight shipping and a 3% credit card surcharge. I got them the next day, but only five of them worked. (It took a bit of swapping to even find four that worked.) I sent the bad three back, got three more about a week later, and those three worked. I now have 16M in my cube, and it doesn't page nearly as much as before. In fact, for a week I had 12M, and I noticed a considerable difference then too. I recommend to anyone who can afford it to add at least 4M to their NeXT (it should be around $175). It really makes a big difference, and it's relatively cheap.

On 14 Feb I ordered a PLI 2.8M floppy ($449) and a SCSI cable for the 040 board (called SCSI-2, but it really just means a funny looking connector) ($45), and received them the next day. I like their $3 overnight shipping a lot--I guess I'm into instant gratification now. I slapped the puppy on and it works just honky-dory. DOS file access is very slow, but Unix floppies work at floppy-like speeds. The slabs do the same thing though, so I can't blame the PLI drive.

I simply had to open up the PLI drive, and inside I found a Sony MP-F40W-1Y drive being controlled by an Intel 82077 controller, just like the one in the slab and 040 cube.

I had originally wanted to get an internal floppy for my cube, but I finally gave up on trying to get a new faceplate out of NeXT. (I would have also needed to find a source for the drive and replaced my full height Maxtor with a half-height hard drive.)

A virgin install (not upgrade) of 2.0 Extended on my hard drive from the 2.0 OD took 180M, including a 16M swapfile. (Note: though I have seen otherwise, I am using 1M to mean 1024K=1048576 bytes, not 10^6 bytes.) This does not include Mathematica or Sybase, which NeXT is supposed to send me eventually.

I had to write a new boot sector to the 2.0 OD to get it to boot. (2.0 had already been installed on the hard disk.) I did this:

disk -b /dev/rod0a
disk -e /dev/rod0a
and inserted the disk after being prompted by a window caused by the disk -b. (Don't insert the OD before until you get the prompt--this prevents an auto-mount.)
The 2.0 extended on OD comes with keyboard tilt feet. I have now removed the ugly phone book my keyboard used to be propped up on.
This is from my installation notes and tells you how to get Monitor working under 2.0 (Monitor is an indispensable tool for watching system resources and traffic, by Roy J. Mongiovi):
I Un-compressed and Un-tared Monitor.tar.Z. Changed "vmunix" to "mach" in Monitor.m and sample.c. Changed all error.h's from /usr/include/streams/error.h to /usr/include/objc/error.h, and /usr/include/sys/assert.h to /usr/include/assert.h in Makefile.dependencies. Added "#define LSCALE 1000" to Monitor.m. Ran make. Did "strip Monitor". 24. Became root. Create /LocalApps, put Monitor there. Did "chown root Monitor", "chmod g+s Monitor", and "chgrp kmem Monitor". Back to me.
Also, I added the include files (/usr/include) to Librarian, and I used the following trick to steal the .h icon from Edit to use there:
segedit /NextApps/Edit -extract __TIFF hfile.tiff hfile.tiff
mv hfile.tiff /usr/include/.dir.tiff
I found the .h icon using otool.
I discovered an ld option that cc passes through (though it's not documented in cc(1)) called -object that allows small programs to have small executables (as it should be). This assumes that you also use strip on the executable.
After you install TeX, you can delete /usr/tex/TeXdist.tar.Z, saving about 7M. You can always pull it off the distribution OD if you need to reinstall. Installing TeX added about 11M, so the net effect was only +4M. Until I start making a lot of screen and printer fonts, that is.
I rewired my serial cable to connect RTS and CTS as per the zs(4) man page. I now use /dev/cufa (hardware flow control) to connect to my modem. I also had to inform my modem to do flow control that way. It works.
Boy, this message ended up longer than I thought.
Good luck with your Ph.D.
Mark Adler madler@pooh.caltech.edu

Hi,
I just ftp'ed the latest issue of the journal over; looks great! I'll be sitting back and reading it tonight once I manage to get away from work.
One thing I noticed: When I decompressed the file, I ended up with >1M worth of stuff; in particular, the WNDocument.wn file in the NUJ12.wn directory was almost 1M all by itself. Then I saved the document somewhere else, through WriteNow's Save As... command, and quit WriteNow. The saved document was considerably smaller (200+K for the WNDocument.wn, about 600K for the whole thing.); I believe WriteNow ended up compressing the document and reclaiming the unused space.
If you wish you might want to do the same for the copy of the journal which is available on the archives; this will cut down on the FTP time.
Ali Ozer Ali_Ozer@NeXT.com

The new issue is great, as usual. I have to admit I like the Frame versions better, since I tend to print the things out, and the Frame versions look a lot better on paper.
I also think that your organization is doing great work, and I'll definitley be supporting you financially. Keep it up!

And thanks for the voice message! My first one!
Dave Nanian

Boy, when you are back it really is obvious. Nobody hears from you in ages and then all at once we get hundreds and thousands :-) of messages.

I haven't had time to read the entire issue yet but it looks very good so far. I don't mind it being in WriteNow format, it sounds like that is the safest way to go for now. My only complaint with the newsletter is the lack of an? margins. I usually run the issue through a 3-hole punch and put it in a notebook for easy access, but this issue didn't leave enough room to hole punch. Please put margins back in for the next issue.
Bryce Jasmer

Erica,

Just a quick note to tell you that you are the greatest.
Love, Rick Reynolds
[Blush!!]

Erica,

NewsFlash!!!! Computer Languages Productivity Award Goes to NeXTstep

On February 12, 1991 , NeXT went to an award ceremony put on by Computer Languages Magazine at the International Software Developers' Conference in Santa Clara. The award category was "Integrated Development Environments." Other categories included such things as compilers, debuggers, CASE tools and "Special".

The nominees in the Integrated Development Environments category were: Smalltalk V, ParcPlace Systems MacApp, Apple Computer Saber-C, Saber Software NeXTstep 2.0 (Extended), NeXT ... and the winner was ... NeXTstep 2.0!
Conrad Geiger

As a wannabe NeXT owner I find very valuable information in the monthly newsletters of various NeXT groups. But being that I don't have access to a NeXT printer I have encountered many problems with the PostScript Level II that OS 2.0 Framemaker and WriteNow are now producing. It would be appreciated if the Framemaker file can also be placed in the archive sites (or at least one) so that us Sun Framemaker 2.1 users can produce PostScript code that braindamaged Level I printers understand. If placing the Framemaker file in an archive is not acceptable then maybe mail compromise can be had.
Doug Boyce,
dwboyce@acsu.buffalo.edu

[in re : At The Beep, reviewed last issue]

1) SES can now handle NeXTmail.

2) People that call the demo system for info can request 3 types of replies:
- Printed brochure (with pictures) to be sent to their postal address
- Text-only brochure to be e-mailed to their computer
- NeXTmail brochure (with pictures) to be em-ailed to their computer

3) When calling, PLEASE spell your name and postal or computer address. They have a much better chance of getting the information!

Thanks and keep up the great work.
Mike Brown mbrown@math.utexas.edu

Perhaps you should consider more stringent editorial parameters so that NUJ submissions will arrive at your site almost edit-free with regard to assembly.

I would strongly suggest stating the column count, width and tabs as well as a set of standard fonts for article submission. That will keep the problems we have had with (for instance) my articles and the formatting you are doing.

Basing this on the given target sheet of paper, the column count would be two (2), and the margins would be 1/2" on each side and with a gutter of 1/2". Tabs would be at 3/8" from the left margins. The fonts should be restricted to the standard ones shipped with the NeXT. Auto-hyphening should be done by the authors and touched up by the editors. All graphics should fit within the 3 1/2" of column space remaining (and be scaled to fit that). Finally, stay away from the 12pt Courier font, it looks terrible. If you have to use Courier, use 10 or 8 pt.

Steve Staton Deltos Fleet Computing

[Will work on it for the next issue!]

Erica -

Do you know of an icon repository anywhere? If one doesn't exist, one should.

- Paul Murphy, murphy@marble.com

Installing WordPerfect for NeXT Computers

Jon Bennett

This is a very short article that will explain a minor problem that I had when I installed the WordPerfect *word processor on my NeXTStation computer. This is not a review of the product. That will come in the next NUJ. Still, you are probably wondering what the gist of the review will be. I can summarize the review by saying that I am very impressed with the package. I will be using it as often as possible. I sure wish that* WordPerfect Corp. *would donate a copy to this newsletter so that I could use it for writing articles. This is written in the usual* Writenow.

The installation for WordPerfect was pretty straightforward. The disks are setup with an *installer* package (two really) so that you get to use the neat *installer* application. If you have not used this application to install a product then you don't know how easy an install can be. Anyway, the reason for this note is that I did encounter a **minor** problem with the installation process. The two packages for installation are the application and the fonts & reference manual. These belong in an Apps directory and a Library directory respectively. The first part of the installation process (for the application package) include steps 1 through 7. After running the installer, it will ask you which directory to install the application in. The installation instructions say:

"Select the correct Apps directory, then click OK."

The question is: what is the "correct" apps directory? Here is the answer:

It all depends on your kind of installation. If you are a user installing this application on a community machine but you want only you to have access to WordPerfect then you should install it in your own **Apps** directory under your home directory. If you want it to be an application that anyone on the machine is allowed to use, then you should install it in the directory that the local applications belong in. The interesting problem is that this directory is not there when a NeXTStation is new. It needs to be created by the system administrator. The directory should be below the root directory and have the name **/LocalApps**. If this directory does not exist in the root directory, then you should create it or have the system administrator create it for you. Make sure that the permissions for the directory are "Owner", "Group", and "Other" readable and executable. To check this use the "File Viewer" and bring up the "Tools.Inspector" and click the LocalApps directory.

The second part of the installation process is to install the fonts and online reference. The installation step (10) says:

"Select the correct Library directory, the click OK."

The correct directory will be the your own **Library** directory under your home directory if you are installing it for a single user. If it is for everyone on the machine then the correct directory is **/LocalLibrary**. The same problems exist for this directory that exist for "LocalApps" and the same steps apply. Once this directory is created then the installation process will proceed without incident. If you start WordPerfect after this and select the font panel, you should see a bunch of new fonts. If not, then you will probably see a message saying that the system is "incorporating new font information... This may take up to 60 seconds". If you see this then there will probably be a message following it saying that there was some problem with incorporating the font information and that the old font information will be used. This means that the information files in the font directory (LocalLibrary/Fonts) was not created correctly. Have the system administrator issue the command:

/usr/bin/buildafmdir /LocalLibrary/Fonts

This will create the information files in that directory and all will be fine. When you bring up WordPerfect again all of the new fonts will be there.

I hope this article will help the new users through the installation process and get them up and running. I will probably repeat some of this information in the review of the product. In the mean time I hope you all call NeXTConnection (1-800-800-NeXT) and order a copy of this package today. You will be pleased with it.

Interface

Pat Rick

An Interview with Dr. Ron Weissman, NeXT's Director of Higher Education.

When NeXT was founded almost six years ago, the initial premise was to create the best academic computer the world had ever seen. Unfortunately, the marketplace acceptance of the then new computer was lukewarm in spite of all the accolades being placed upon the machine's hardware and software innovations. Yet, for those who truly believed in what NeXT was trying to accomplish, their faith would not fade.

Faith was almost a requirement for these last few years as the cube's promise seemed as if it would never be realized. The death drums were beginning to sound as the popular press that had promoted NeXT so strongly was now beginning to retreat.

Presently, the drums have been silenced by the backlog of orders for NeXT's new machines. Although the people at NeXT have always been convinced of the righteousness of their cause, in speaking with them recently, there is a new sense of excitement and of affirmation as sales have risen beyond their expectations. But how does this recent success relate to their original commitment to higher education? As the second coming of NeXT takes shape and as more academic developers move to the NeXT platform, will we experience a Renaissance of learning, a NeXT Renaissance?

Fortunately, there is someone who is extremely well qualified to answer these questions and others - Dr. Ronald F.E. Weissman, NeXT's Director of Higher Education. Dr. Weissman was an early member of NeXT's advisory board and has served on similar boards for Apple, IBM, Microsoft, and Sun. He has also been a consultant to the United Nations, to the World Bank, and to numerous departments and agencies within the federal government.

This Fulbright Scholar and member of U.C. Berkeley's Phi Beta Kappa Chapter was trained as an historian and has been recognized as a distinguished scholar of the Florentine Renaissance. Dr. Weissman has *had a long and successful career in academia as both a high ranking computer administrator and an associate professor at the University of Maryland and, most recently, at Brown University. These academic postings along with his long-standing relationship with the computer industry have made Dr. Weissman highly knowledgeable about the issues facing both technologists and educators at institutions of higher learning.*

While the following interview itself was conducted by Pat Rick (Contributing Editor, NUJ) in early March, many of the questions were collaborations between members of the NUJ staff. As usual, some passages have been edited for readability and clarity. Ronald Weissman is literally and figuratively NeXT's Renaissance man, and we believe that he, as the voice of NeXT, provides a clear view of many future aspects of computing and of education both in and out of academia.

How did your relationship with NeXT begin?

Before coming to NeXT, I was at Brown as Assistant Vice President and before that at the University of Maryland. I was one of the early members of the NeXT advisory board. When NeXT was founded, it was founded as a higher education focused company with a mission to develop great technology for teaching and research, and I was involved with Next very shortly after the company was founded.

What made you decide to leave academia and join the commercial sector?

I had been doing work for years in the commercial sector, consulting for the federal government and for many start-ups. So I knew this piece of the world well. Unlike many in higher education, I don't draw a sharp dichotomy between what goes on in higher education and what goes on in the commercial world. I think that they are two very important pieces of our lives. I have always enjoyed being involved in both.

My concern was that I wanted to help set the direction for the technology that higher education would be using, and my real concern was that higher education was increasingly in the position of implementing things that industry developed and less in the mode of inventing the technology itself anymore. It was more inventing great uses for the technology, and I wanted to help shape the technology. Second, I really believed in the kind of technology NeXT was developing and very much wanted to have a role to play in pushing it further, and Steve Jobs made me just a fantastic offer. But it really suited my own interests and skills

What are your present responsibilities?

I direct everything that NeXT does in the higher education market place. I manage the higher education market, relations with all of higher education. I manage all of our sales programs for higher education, our pricing for higher education, our strategy for higher education, our strategic relationships.

I'm the principal person within NeXT who advocates the concerns of the higher education marketplace back to NeXT and defines many of the tests and requirements.

I'm not alone of course, but I'm the senior person in the food chain who gets the data to folks at NeXT. I'm one of the senior members of the NeXT sales and marketing organization.

What is NeXT doing to take care of its backlog of orders, and will you be adding production capacity?

We're doing everything that we possibly can. In fact, I myself have spent Saturdays at our factory, cutting my hands, stuffing starter kit boxes to try to get as many machines in production as we could to our higher education customers.

Some of your competitors in academic sales have said that since you don't have a true presence in the marketplace, they no longer consider you a viable competitor. With your sales increasing, how would you respond?

I know for a fact that is not true - today. In fact, good friends at Apple have told me that several months ago NeXT went back on the competition list. Apple maintains a strategic competitors profile, and I know for a fact that we were put back on that list, probably, three or four months ago. That's one key point, and I know that Sun is actively tracking what we're doing and, in fact, has copied a number of our higher education programs.

How would NeXT like to be perceived when compared to its competition?

Let me speak a bit openly here. I'm going to be free associating here, so pardon me if I ramble for a minute. I believe, and I think many in higher education believe that one of the great opportunities is to create a superb scholar's workstation platform, about which I've written a fair amount well before I ever came to NeXT. A kind of multi-functional place where scholars, faculty, students, and staff members manage their research, instruction - their data oriented lives, all their tools, all their calenders, all their networking, all their electronic communications, all their research, all of their key analysis tools in a very seamless multi-functional way. This has become kind of the Valhalla of academic computing, university computing, for quite some time.

If you look at the competition today, you have two classes of technologies. You have personal computers which are great in terms of end- user software and great in terms of ease of use. They're lousy in terms of networking. They're lousy in terms of how well you can collaborate. They're lousy in terms software architecture because they don't do true multitasking. They don't have great virtual memory. You can't seamlessly integrate things very well and expect the system not to break. On the other hand, you have UNIX workstations where the great virtue is the UNIX operating system - great platform technology, and the biggest weakness of UNIX workstations is also the fact they are UNIX workstations which I call tools for propeller heads. I would put Sun, HP/Apollo, DEC in that category. They're not tools for people. They're for niche markets, for a few scientist and engineers who are very deeply embedded in computing.

What we're trying to do in higher education is create a platform that has all the underlying virtues of a workstation platform - performance, power, speed, multitasking, virtual memory - for the purpose of bringing those benefits to end-users, for great end-user software, for great tools, for what we call a great out of the box experience. We are not trying to be a machine for propeller heads. We are not trying to be a machine solely for the technologically adept.

Although we want to be a great machine for engineers, we also want to be a great machine for students of French, and today, you've got low end PC technology for the humanities and very high end unfriendly technology for engineers and nothing that combines the benefits of both. That's where the real opportunity is - to have the fundamental performance of a workstation but the ease of use, the functionality, the software of a PC - a tool that is just as good for the humanist as it is for the scientist.

In the near future, what will constitute a well educated person?

Let's look where education has come from. Really, between classical antiquity and the 1920's, the western world, at least, and I can only speak about the West since it's the only culture that I'm really conversant. I'm a former Professor of History, so pardon the digression. We had the notion that the well educated person was a person who had a kind of both aesthetic and moral sensibility and that the goal of the well educated person was to be basically well-rounded and able to make good judgements and to be a responsible member of the community - education for citizenship if you will.

From the 1920's until the recent present, we have been in what's been called by the education world, the Modern Period. We've focused on teaching people not values, not principles, not aesthetics, not judgement but technique, individual things. How to be a lawyer. How to do statistical analysis. We focused less on creating educated people than creating specific kinds of people, and I think the pendulum is swinging back to this notion of a more holistic, informed, broadly educated, and technically skilled person. We're redressing the balance between technical skills and broad general education and trying to bring greater, not only, rigor but coherence to the curriculum. I think that is the challenge of the nineties.

The past forty years went overboard, with technical education for its own sake, producing lawyers and engineers as opposed to broadly educated and deeply trained people. Now I think we're going to have a broader balance between technical and broad education neither one nor the other but a more harmonious blend of both.

The people who are asking most for this are the people who have traditionally focused on the most narrow kind of education like the pre-medical community wants physicians and the legal community wants the pre-law students to be broadly based and broadly cultured and broadly skilled. Even recent articles in things like *Datamation* say that tomorrow's MIS person ought to have a broad background in analytic thinking and acculturating skills given what that person has to do which is really to be the cultural manager of the resources of an organization. They don't want people who simply know all their is to know about C++ or databases. A recent article in *Datamation* calling for the rebirth of the 'Renaissance man' as the salvation for organization based computing, and I got to say that I agree.

The implications for computing, I think, are profound, and computing parallels much of this development. Most computing for the past thirty years has given us better analytic tools, very narrowly circumscribed kinds of things, and if you look at where computing was used in higher education, it was to model things and/or to do things like statistical analysis, technical analysis.

The challenge for computing in the 1990's is going to be to integrate and access information of all kinds much of which isn't rigidly structured numerical information or easily modeled numerical information. The challenge is to represent concepts. The challenge is to represent philosophy. The challenge will be to do things like index and archive musical scores, art objects, and to make them as accessible as traditionally structured information as we begin to say the world is composed of sensory, visual, oral, and emotional data as well as highly logical data that's easily represented in terms of scientific knowledge structures.

How can a computer help us organize, conceptualize, manage and access the complete experience of humankind? So, as we are moving away from narrowly technical education, we are moving away from the notion of computing as a narrowly focused set of technical skills and technologies. So, the 1990's are going to be an extraordinarily exciting decade for computing.

Many futurists believe that eventually the

majority of people will attend universities on-line from their homes and offices. Others feel that there is no substitute for classroom interaction with professors and other students. How do you view the future in terms of the university and information proliferation to the general population?

First, I've often been asked, when we were trying to do initial computer outreach at the University of Maryland and elsewhere, "Isn't this going to replace the faculty member? Isn't the faculty member centrally important?" First response is there is no motivational substitute for the direct human contact of a gifted instructor and a challenged student and that is one of the most exciting experiences on both sides of the spectrum.

I have never had experiences in my life that were as personally rewarding as that kind of electricity I had with gifted teachers. I can sight a few. I was a student of the current president of the University of Chicago, a woman named Hannah Grey, when I was a junior in college. My year with her when she was on sabbatical at Berkeley was probably the single most stimulating year of my entire life, and it totally changed my life. That could not have happened over e-mail.

But looking more broadly, it's not either or. It's what's the right combination. For some learning environments, the choice is either not getting additional education or an educational experience at all or getting it on-line. Clearly, where there is mix of great electronic technology and great personal interaction that's the best blend possible.

This is the big challenge of the community colleges today where they are thinking about distance learning. That is the current 'buzzword' that's sweeping the community colleges and some four year colleges as well. How do you reach out to a remote areas of a state? How do you create an educational network that enfranchise everyone? So, for the people for whom it is either distance learning or no learning at all, the question is a moot point.

What we should be asking as a community of scholars is how can we create as much of that interactive experience as possible on-line for students who can't directly be touched by a living, breathing human - face to face. What can we do to create as much of that on-line as possible in those situations where for one reason or another either disability or simply distance makes it impossible? And at NeXT, we're busily experimenting with what we call interpersonal computing which is a way of magnifying the personal contact between two people or a work-group through things like voice annotation which create a more vibrant sense of immediacy for commentary on a student's paper or on a meeting or whatever than a scribbled note in a margin ever could. We are looking at, in fact experimenting inside the company with, a black boarding system we call Gray Board that allows multiple people to conference long distance. You see icons of their faces, and you can have a conference real-time across the country with multiple people on board each commenting and annotating a common scratch pad and passing a marker in between them to indicate whose turn it is to speak.

We're trying to think of ways that we can enliven the distance experience through multimedia, through voice technology, through high-bandwidth networks. We think we can help, but we're never going to replace that vibrancy, that one to one contact.

Please give your thoughts on what's now called hypermedia, and what role NeXT might play in this new medium?

Next is very concerned about different forms of information integration. There are text databases that are accessible through tools like Digital Librarian- unstructured textual stuff, and then there is highly structured information traditionally stored in back-end SQL databases. Well, what we're busily worrying about is are there some common ways that we can think about this kind of stuff so that users don't need to use multiple kinds of tools to get at it. We should be thinking about extensions to how one browses and navigates information.

I can't provide information on future product directions, but these are the kinds of issues that do trouble us or concern us and interest us deeply. What's the future of information access architectures where one starts creating more common paradigms irrespective of how information is structured. That's my most global answer to that question.

Since the commitment to academia is intrinsic to your corporate culture, will we be seeing academic sabbaticals or co-ops sponsored by NeXT?

Right now, we are a very very small company, and it is premature to announce programs. In the future, I think there are going to be many opportunities for people to collaborate with NeXT in many ways.

What was your initial reasoning behind publishing *NeXT on Campus* and has this changed in anyway?

One of the most exciting things for me about universities is the intellectual community that they can create, and I want to see a great intellectual community created around NeXT technology. I'd like to see vibrant debates and discussion. I'd like to see people investing their ideas in our platform and vice versa, and I'd like to see the word get out about great people doing great things. That's one of the reasons why a computer succeeds in changing education, and we're in the change agency business.

We want to change things. We want to improve the quality of teaching. We want to improve the quality of research and provide the platforms capable of doing that. And you don't do that by hiding your best assets which are the people who invest their intellect in doing things that you didn't think were possible on your own computing platform. So, for me, *NeXT on Campus* is first and foremost a means for sharing, communicating, and creating intellectual community around an important technology.

What role do publication such as the *NeXT Users' Journal* play in this larger community you've mentioned?

I think they play an analogous role and a very important one. I'm going to back up a minute here and say that one of the dangers that I see in the computer industry is a growing rigidity and a growing insistence on standards for their own sake. A kind of stultification taking place and that if we're not careful that the desktop computing industry is going to be as boring as the minicomputer and mainframe industries are today where there has been no fundamental change in technology, in many computers for a decade, and in mainframes, a part from faster and cheaper, for two decades.

What user groups do and what user focused journals do is keep the pot boiling. They keep new technology alive, and they create an opportunity for companies that have something different like Adobe five years ago, like NeXT today - companies with something new or different to say or to develop. They create a space of opportunity to try, to test, to argue, to discuss the merits and demerits, and to create a body of opinion, a voting with your pen so to speak. That creates a space for innovation. It broadens the standards currently supported. It creates new opportunities, and the success of any new technology, I think, requires two things - first, the evaluation of its merits and second, a community of people who believe in the merits.

Technology by itself doesn't succeed. It's communities of people doing the right thing that makes any good idea succeed. I can't think of too many things that are more important for the success of new technology than articulate and able champions with a point of view. And you guys can provide a point of view that we can't because we are NeXT, and we are going to be more careful and more circumspect in criticizing ourselves. Anybody is. And you're going to be honest, forthright, and you're going to force us to confront issues. You're going to champion things that we may even have thought that were less important that you guys bring to our attention. But you are going to create the dialogue, the discourse, the community with us, and that independent point of view is just fabulous.

How is NeXT moving to expand it's user base and to instill loyalty, brand loyalty?

As a company, I don't think that we think quite in those terms. For us the most important thing to do is what I call to keep the magic flowing. We are a new technology, and we're going to succeed because users perceive that it's valuable. And right now, we are at the stage of a new technology where one of the driving things is magic - that sense of excitement, innovation. I can't do this kind of stuff on any platform but yours. So to create the customer base and the loyalty that you are talking about although I wouldn't use those terms, I think the most important thing for us to do is to invest creatively in pushing the ball forward in terms of innovation and that's sort of our contribution to give everyone else a kick in the pants.

If you listen to our competitors, our competitors will be coming out with machines within the year using the same kind of underlying processor technology that we're using at probably two to three times the price that we introduced our technology at last September. They are going to say that they can't do it for any less, and if we weren't around, they would be far more lazy about pushing their own technology advances.

We are giving industry a target to meet. We're keeping the ball moving. I think that is very important for this industry, so that it doesn't stagnate. Given where we are as a leadership position in technology instead of following and me-to-ing with yet another '386 clone, our role in terms of customer loyalty is to be out there ahead of the pack. Providing fundamental value at a great price with great features, great performance, and great vision. That's our unique role. It's not to be the cheapest clone on the block. It's to be the best computer on the block.

How do you perceive the role of notebook user interfaces and might NeXT consider and extension to Mach for stylus input?

Well, currently we support digitizer input today. System 2.0 comes with drivers to connect things like pressure styli. You can use Wacom tablets as a case in point. So, in terms of the fundamental hardware architecture, there is nothing there that's fundamentally limiting.

The question is is the pen-based computer, which is the current rage which I think has a very important niche to play, the one that's right for us out of the many things that NeXT might do. Among the things, we are committed to is incredibly fine display technology. One of the signatures of a NeXT product is that it has about the best resolution fidelity to the real world and visual pleasure for the user. It's a fantastic experience to sit in front of a NeXT screen as many of our users have told us.

One of the great virtues of pen-based computing is portability. Most people sitting in front of a stationary place, sitting in an office, know how to use a keyboard. A stylus might be great for some things. It's best in a CAD environment. But I don't think that people who are attracted to our kind of technology are keyboard illiterate or for whom a stylus would be, for standard kinds of tasks, much of an advantage over a keyboard and a mouse. Now, in a highly mobile environment - absolutely, but I don't see us giving up the quality of screen and the size of screen that a multitasking environment requires to view multiple things and to see them in great fidelity. I don't see us giving that up in favor of miniaturized portability - in the near term. That is not the kind of place that NeXT is going to be focusing its attention on in let's say the next year. The technology to do that just doesn't exist.

So, if we have to make a choice between a fabulous user visual experience and notebook portability, in the short term, I think its going to be maintain the quality of the experience. Now, we have great solutions to collaborate with portable computers. We are fully MS-DOS file compliant in terms of our floppy disk so one can use a portable computer on the road and pop one's WordPerfect or Lotus file in and use it both at NeXT and on the road. So for people who need portability, we are fully compliant, but we offer a different class of experience.

I ask you as a user, would you rather have us be doing things like investigate interfaces, other architectures, fast color, things of that sort? It is either or because you can't do everything. Or would you rather have us worry about stylus based computing which other people are doing supremely well?

Please, characterize any differences between supporting third party developers and supporting academic developers?

I have people in my organization that report to me whose job it is to work with academic projects and to ensure that the software that higher education needs is available and is interesting and fun and great. And people within my organization have dotted lines reporting responsibilities between my group and our third party developer group. So we have parallel programs in place and are trying to offer analogous support.

Now the needs in many cases are quite different, and the cultures are quite different from let's say a large commercial software organization and a faculty member with a bright idea. We are trying to support each in terms of the kind of culture that each is use to, but we've had many, many academic developers to our development classes which are essentially the same the class. So we are trying to support both.

A computer administrator at a major southeastern university mentioned that what he was looking for was voice recognition. Is this a viable option for NeXT in the not too distant future?

I just don't know myself. It's not something that I'm up to date on myself. I just can't give you an intelligent reply to that question. It's not because I'm hiding anything it's just something I haven't spent much time playing with recently.

I know we have friends and colleagues at Carnegie-Mellon who have developed very exciting technology. I think we are probably going to let higher education show us the way and bring us ideas. Again, I don't have an intelligent response to that question. It is just something that I haven't been paying too much attention to personally although there are people at NeXT who have.

With X windows a de facto standard for many academic institutions, would NeXT ever consider bundling it?

I'm going to give you two answers. The first answer is that I was one of the people internally in the company who championed making sure that there was some kind of X windowing system on our machine and that we lived hospitably with it - not because we believe in it. We don't but because we know there are many people who need for some campus wide application or for some research application or for some teaching applications, they need X like they need MS-DOS. We don't believe anymore strongly in MS-DOS than we believe in X, but it is something that many people told us that they like to have on any box connected to a campus network.

If we have resources to invest in, we would rather, as the case of stylus technology, invest in things that we do well and are committed to intellectually and believe in and adds NeXT value and have people pay extra. If we are going to bundle something, we'd rather bundle Mathematica which we believe is a fundamental value to teaching and learning and, for those people who want X windows, our commitment is to make sure that it is available from a quality third party supplier with rich functionality. We would rather bundle things that are of NeXT value rather than things that a lot of people will not use or want and that don't add any particular NeXT value to them.

We're glad that X windows is there, and we worked very hard with our third parties. We are happy that it is. But we don't believe that it's within our interest to propagate, encourage, discourage, or anything. It's there. It ain't our religion, and if people want to go to church and pray, that's fine.

Has the growth at your archive sites lived up to your expectations?

Before I answer that question, I probably would want to do a survey of our user community and hear feedback. The feedback that I've heard informally and in unstructured ways has been good. I haven't heard much in way of complaints, but the real question is to ask end-users. If our users are happy, then I'm happy. If they're dissatisfied, then I'd like to know about it, and work with the archive sites to better serve user needs. But this has not been a hot issue that users have raised with me.

Often capability doesn't automatically transfer into action; therefore, what incentive do developers need to create the objectified units of functionality that you wrote about in the last *NeXT On Campus*?

Pragmatically, the proof is in the showing and the doing. Things like HSD's OCR Servant are a perfect case of application messaging, modularity, object functionality that just create extraordinary value for lots of other applications. There is a great company in New York, Objective Technologies, that has a Mathematica object that anyone can use to use Mathematica as yet another Interface Builder programming language to write whole kinds of code in Interface Builder not with Objective-C but with Mathematica. They also have a whole bunch of mini-apps that are palettized and add great functionality for people doing certain kinds of analysis, and what we're trying to do is to show the value of taking an object architecture approach instead of a totally stand alone approach. And you'll be seeing from Lotus that they too believe in object messaging, and that their software ought to be accessible and available to other applications so to in the case of Mathematica.

Many of our vendors get it, and we're working to evangelize and to show the proof in the pudding that this stuff is really of extraordinary value and is much more interesting than a classic closed, stand alone application. So I'd say that one of the reasons that I wrote that article in *NeXT on Campus* is to aid the evangelization effort. I also didn't say anything in that article I hadn't already written elsewhere well before I joined NeXT. This is something I have been passionately committed to for years. This kind of architecture which again is why I find NeXT so attractive. But it's all evangelization. It's all acculturation.

Since many large corporations spend substantial sums of money in training staff and, sadly, remedial education, would this not be an easy niche for NeXT to fill?

Absolutely, when I visit two year colleges or look at freshman programs that are needed on campus after campus after campus, the kinds of technology needs and even infrastructure needs are very similar to the corporate and commercial and government training world. I see a great opportunity for symbiosis between training and some kinds of higher educational applications and also K through 12. I think this is increasingly the same world. So my answer is yes.

Are there any particular industrial training programs that NeXT is involved in?

Our phone is ringing off the hook by some of the key players in the training world. I can't go into names or talk about specific relationships, but the names I could mention, you would all know. Major companies investing substantial resources into developing training systems and training philosophies and training architectures as well as major commercial customers of ours who are coming to us precisely because they view us as training platform.

There is a multimedia at the end of march in which I'm one of the key speakers, and I've been invited to speak at this multimedia conference on the NeXT platform as a platform for higher education and commercial training. So there are obviously other people out there who understand that too.

Are there any academic developers that you might consider stars who have used the cube beyond what you might have envisioned?

All I can say is that there are lots of them out there, and they come in very different shapes and sizes. I'm going to give you some very different examples. Again, there is some philosophy here so that when you're looking for stars, sometimes you're looking for people who have done the extraordinary and that's one class of academic developer. Another class of academic developer are people who have proven that you can make substantial changes in education without having a 'star wars' budget and that many people can participate.

Aside from NeXT, for the moment, in terms of what I mean, there is a friend and colleague at the University of Maryland named Charles Misner who got the bright idea to create an entire physics sequence using spreadsheets about five years ago and created a whole environment that he called Physics 123. Now, what he did was show that you could do fundamental curriculum change without having to have the budget of Harvard University to do something substantive and interesting, and you didn't need to hire a team of thousands of programmers to do that. So that's what I mean by there are some revolutions that are revolutionary not because they're huge and expensive but because they show the rest of the world how doable stuff is. Let me give you a case in point of each.

At the Stanford Linear Accelerator, Paul Coonts has developed a whole new way of visually thinking about statistical analysis as it conforms to an easily understood visual metaphor, and this project was written up in the first issue of *NeXT on Campus*. A project called Reason that is one of the most interesting, illuminating, informative, revolutionary approaches to statistical analysis that I've ever seen. That is for me a kind of 'star wars' project. It was done by someone with the great backing of the Stanford Linear Accelerator, a professional researcher. It didn't take him all that long, and he didn't spend physically a lot of money. But he was in a very supportive, very high tech environment. It's a great project, and you have to see it to believe it.

Another class is a normal faculty member, who had never been in computing before, with an environment that is not, shall we say, the resources of a Carnegie-Mellon or a Stanford, but shows that you can accomplish fundamental stuff by thinking intelligently about the tools that you have at your disposal. There is a husband and wife team at Allegheny College in western Pennsylvania, Susan and Joel Smith. She teaches English, and he teaches philosophy. He's become a NeXTstep programmer and has been doing Interface Builder materiels for teaching philosophy, and Susan Smith has done something substantially simpler than her husband has done but no less interesting or important. It's to figure out how voice annotation and e-mail can entirely change the interaction between faculty and students in the correction of English essays. This makes the process not only more fun but changes the onus of explanation from rewriting a students essay to commenting in real-time about what's wrong and forcing the student to rethink how one writes. Typically, when one annotates a paper in the old world, one rewrites a paper, but Susan has figured out a clever way combining e-mail and voice annotation where one comments but doesn't do the work for the student and has gotten lots of people in the English teaching curriculum business to begin to rethink how collaboration can change what goes on in freshman writing courses.

Now I would rate her achievement as important as Paul Coonts's and as interesting but from a very different perspective. So I would give you both of those.

I would also say that Michael Mezzino at the University of Houston has done a mathematical visualization application that has been winning prizes around the country that is extraordinarily interesting in terms of helping students to visualize some basic mathematical relationships. I think his work is absolutely first rate and, again, focusing on how you get students to fundamentally change the way they're thinking about a subject that they didn't think that they could get. So those are three places to start, but as I said, we have 150, 200 projects that we know about right now that are interesting - interesting enough for us to keep tabs on.

There are still some who feel that NeXT might fill some specialized niche and never take a significant portion of the mainstream marketplace. It would take on an Amiga like existence. How would you respond to these statements?

Only time and our markets will tell, but we have been broadly embraced. Today, we have very strong direct relationships with several hundred universities and through them, through a program called our hub program, to some of the universities that we just can't get to because of our small size.

So we're being widely embraced, and we're being heavily back ordered. There are labs going up, not simply individual faculty or student adoption, but whole labs of machines at campus after campus after campus. We are winning important prizes. Our phones are ringing off the hook from people in disciplines as different as statistics and the history of philosophy. Here, I'm not speaking of Allegheny College. I'm speaking of some very different places. So I think that we are being widely embraced.

So we're not being perceived as good for one or two applications or only for one limited marketplace. So I think that the market response to us has demonstrated that we are not a niche player.

Fascinating (although pretty silly) Stuff

Conrad Geiger

Delete, if you are not interested... I want to head off any rumors...

YES, Steve Jobs got married today, March 18.

conrad

P.S. Remember that you heard it from me first.

Conrad, proud father now of TWO, still owes us a digitized picture of his newborn!

New Stuff : X.25

Conrad Geiger

Today, Morning Star Technologies announced their release of the first X.25 communications product for the NeXT platform.

What is X.25?

X.25 was first proposed by the CCITT (Consultative Committee for International Telegraph and Telephone) in 1979 as a general purpose packet switching data format for use between data processing equipment. X.25 proposal was designed to prevent networks in different countries from developing mutually incompatible interfaces. It spans the lower three layers of the seven-layer OSI network model (network, data link, and physical layers) and permits full network layer service by the network service vendors throughout the globe.

The proposal has been modified and updated over the years and has steadily gained support. It is rapidly becoming the protocol of choice for efficient wide-area data communications, many large networks having been built around it. Telenet, Tymnet, and Accunet are well known examples in the United States, and most European governments have established their own, such as the German Post Office network and the French Datapac network. Native TCP/IP applications can work over X.25. Morning Star X.25 provides an easy and flexible means of transferring data between the NeXT system and an X.25 network. Users of the NeXT system have a complete access to X.25 networks for wide-area data exchange or simply for system-to-system file transfer in a two node "network". Using the integral X.3/X.28 PAD and X.29 user interfaces, remote login and interactive terminal sessions across large networks are possible. The NeXT's native TCP/IP implementation can use X.25 virtual circuits as described in RFC-877 to create a wide-area internetwork, providing access to remote hosts using the same TCP/IP protocols and familiar commands as on the local area network.

?Works with existing application

Customers who have written applications that run with Sun Microsystems SunLink X.25 product need only recompile using Morning Star's libraries and the application will now run on the NeXT system. Morning Star Technologies is pleased to announce the release and shipment of Serial Port X.25 software for the NeXT. When making inquires please use part number X.25/Daemon-S for the NeXT 040 machine.

Morning Star Advantage

The Morning Star X.25 communications gateway allows **most UNIX systems** to communicate with other devices that are attached either directly or through public and private packet switched networks. The X.25 gateway software runs on all of the existing Morning Star hardware platforms and will operate on all future platform designs.

Interface Flexibility

Morning Star supports numerous interfaces to the X.25 gateway product. The IP driver interface turns your system into a powerful internetwork gateway. Local IP traffic is routed to any destination on the X.25 networks that are connected to the Morning Star gateway. This allows users to share system resources among multiple, remote locations using their computers

TCP/IP facilities. The socket interface is source code compatible with the SunLink* packet level interface. Any applications developed to run over SunLink X.25 can simply be recompiled with the Morning Star supplied libraries, giving the customer a transparent migration path to a wide range of UNIX platforms. Remote PAD users can establish transparent login sessions on the local machine using the X.29 interface. The X.3/X.28 PAD interface supports outgoing calls via cu, tip and UUCP. The wide variety of interfaces provided by the Morning Star X.25 communications gateway make it one of the most flexible products on the market today.

Packet Switching

The X.25 communications gateway serves as a packet switch for multiple devices or for networks connected to it. The Morning Star gateway can be used to insulate a Public Data Network from a non-compliant or non-certified X.25 device.

Hardware Flexibility

The X.25 gateway software runs on a wide range of hardware platforms giving it the flexibility to work on most UNIX computer systems manufactured today. Because of the range of our hardware products, the customer can select the platform that suits their performance needs and budget. Morning Star offers a wide variety of the most frequently used serial interface types.

CCITT Compliant

Morning Star X.25 software is 1980, 1984 and 1988 CCITT compliant. The software is DDN and TYMNET certified with new certifications being added as they are requested.

Hooking-up My Modem

Mark Adler

People seem to be having problems getting their modems to work, so here is how my modem is set up and how I use it (a public service message).

First off, I highly recommend that you obtain and read the documentation from NeXT in their TechSupportNotes series called SerialPortDoc.wn. It is complete, well-written, and even has pretty pictures of the DIN-8 and DB-25 connectors. (You may have to do a Command-u in WriteNow to see the pictures.) You can get it via anonymous ftp from cs.orst.edu in the directory pub/next/documents/TechSupportNotes. (This doesn't apply to 68040 NeXT's. In that case, look in the online documentation for "serial" and in particular at the zs(4) man page for pinouts.)

The modem on my NeXT works just honky-dory for both dial-in and dial-out. I have an Everex/Abaton EverFax 24/96E. (The fax part won't work until I get 2.0 and a new ROM and RAM for the modem to implement a Class II Fax command set, but that's a different story ...)

CABLING

Given that the pins on the male DIN-8 connector look like this:

```
 6 7 8
3  4  5
  1  2
```

then my cable, which came with an EMAC (Everex) modem, is wired thusly:

DIN-8	DB-25		means
1	20	DTR	data terminal ready to modem
2	8	DCD	data carrier detect from modem
3	2	TD	transmit data to modem
4	7	SG	signal ground
5	3	RD	receive data from modem
6	NC		
7	NC		
8	NC		
case	case		the metal connector housings and probably the cable shield also

The NeXT documentation mentioned above says that pin 8 of the DIN-8 connector should be connected to pin 7 of the DB-25 (signal ground) along with pin 4. Apparently, this is not necessary. Pin 8 is labeled RXD+ implying that it's a return line for pin 5 (RXD-). Perhaps connecting RXD+ to signal ground is necessary at baud rates higher than 9600, but at 9600, I see no errors in reception. If you are wiring your own cable, you should follow the NeXT directions, but if you have a cable like mine, it'll work. Pin 8 should **not** be connected to ground for serial ports on 68040 NeXT's (see below).

Note that pin 2 on the DIN-8 is labeled CTS (clear to send) by NeXT. Ignore that. It should be connected to DCD only. I bought a $5 Mac-modem cable off a clearance table that had pin 2 on the DIN-8 connected to both DCD (8) and CTS (5) on the DB-25 end! This cable did not work. (If it weren't for the RS-232 standards concerning connecting two outputs, it might have even damaged my modem.) If I wanted to use this cable, I would have broken off pin 5 in the male DB-25 connector.

The 68040 NeXTs have slightly different serial port connections. The above cabling will work fine with the 68040 serial ports, so long as you **don't** connect pin 8, as the documentation for the 68030 ports suggests. If you also want to use hardware flow control, you will need to connect DIN pin 6 to the DB-25 pin 4 (RTS) and DIN pin 8 to DB-25 pin 5 (CTS). DIN pin 7 should remain unconnected. I made a new cable and I now use hardware flow control.

MODEM CONFIGURATION

The important control signals are DTR and DCD. The modem needs to be set up to respond to DTR and generate DCD in a specified way. When DTR is asserted, the modem should allow auto-answer and respond to commands. When DTR is deasserted, it should not allow the above and also hang up the phone if it was off-hook. The modem should assert DCD if and only if a carrier is detected.

My modem's default behavior is to always assert DCD and to always ignore DTR. I suspect that all modems for the Mac and PC world are this way, since modem control is not needed in most cases. This default behavior makes the modem/computer connection a little more robust to cable variations. However, it's too limited for dial-in support. You will most likely have to read your modem manual to change this behavior. (Perish the thought.)

On my modem, I used the command:

AT &C1 &D2 S0=5 &W0

The &C1 makes DCD reflect the carrier status, and the &D2 makes the modem respond as described above to DTR. The S0=5 tells the modem to answer the phone after five rings (the default is S0=0, which doesn't answer at all). Finally, the &W0 writes the configuration to the non-volatile RAM, so the modem will always be this way when powered up.

If you want to use hardware flow control (only available on 68040 NeXT serial ports), then you will also have to tell the modem to use RTS/CTS flow control. You will have to (shudder) read the modem manual. On my modem, I said:

AT \Q3 &W0

DIAL IN

For dialing in, I changed the ttyda line (I use port A for the modem) in /etc/ttys to:

ttydfa "/usr/etc/getty std.9600" vt100 on

where the 9600 is the speed to talk to the modem at, vt100 says to assume the terminal dialing in is VT-100 compatible (you can leave this as "dialup" to make no assumption), and the "on" enables dial-ins. If you aren't using hardware flow control, then ttyda doesn't get an "f" stuck in. For this change to take effect, you will need to reboot or send a message to the init process by:

kill -HUP 1

Don't mess with the ttya or ttyb lines---they're for permanently connected terminals and do not allow sharing the port between dial-in's and dial-out's.

DIAL OUT

For dialing out, I use Kermit 5A (4E and 4F also work fine) in a Stuart window (Shell or Terminal also work fine, but there is no emulation in Shell). My kermit command line is "kermit -l /dev/cufa -b 9600" where the "a" in "cufa" selects serial port A, and the 9600 is the bit per second rate. If you are are using a 68030 NeXT, or aren't using flow control on a 68040 NeXT, then you would leave out the "f". I use 9600 since MNP 5, which supports compression, can sometimes require more than 2400 bps. It is important to use /dev/cua or /dev/cub and **not any /dev/tty** to allow sharing the port for dial-in and dial-out. You may have to change the permissions on /dev/cua and /dev/cub to be able to use them. Alternatively, you can give special permissions to kermit by making its owner uucp and making it suid(set user id)t as follows:

chown uucp kermit
chmod u+s kermit

You can get the kermit source via anonymous ftp from watsun.cc.columbia. Version 4E is in kermit/b. 4F is in kermit/ck4f, and 5A is in kermit/sw. You can get Stuart from cs.orst.edu in pub/next/binaries. (In 2.0, the new Terminal is a NeXT adaptation of Stuart.)

As a side note, kermit 5A supports large packets (over 9000 bytes) and continuous transmission of packets with delayed acknowledgement (called sliding windows), which results in much faster transer rates when using kermit protocol transfers.

SUMMARY

1. Make sure DCD and DTR are wired correctly on your cable, and that CTS isn't wired (unless you are using hardware flow control on a 68040 NeXT--in that case wire RTS and CTS as noted).

2. Convince the modem to respond to DTR and generate DCD appropriately, as well as answer the phone if it rings. (Also convince the modem to use RTS/CTS flow control for a 68040 NeXT, if desired.) Save the setup if you can.

3. Edit /etc/ttys and put in an "on" to enable dial-in's on the port with the modem (ttyda for port A, ttydb for port B). Change the baud rate and terminal type if desired. (If using hardware flow control on a 68040 NeXT, change it to ttydfa or ttydfb.)

4. Use /dev/cua or /dev/cua with your communication program, NOT /dev/ttya, /dev/ttyb, /dev/ttyda, or /dev/ttydb. **You may have to chmod the permissions on /dev/cu**. (If using hardware flow control on a 68040 NeXT, use /dev/cufa or /dev/cufb instead.)

Good luck.

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IB Palette Objects

Dana Foy

Howdy, I've created two new objects:
1) TextFieldPlus (subclass of TextField), and
2) TextFieldPlusCell (subclass of TextFieldCell)

I've also created a loadable palette and inspector for 2.0 IB for these objects. TextFieldPlusCell supports the specification of output formatting, input validation, and error message handling for alphanumeric, numeric, and date/time type of data, along with the set of attributes already supported by TextFieldCell. All the smarts are in TextFieldPlusCell. TextFieldPlus provides the view for a single instance. A Matrix (or subclass of matrix) of TextFieldPlusCells can be used for multiple instances.

The inspector allows you to select from four Views to set the attributes:

1) Presentation Attributes allow you to set the same attributes as does the TextField inspector.

2) Output Formatting allows you to set a format and related info. The pop-up list provides a pretty good cross-section of possible formats and provides a learn-by-example way of understanding the format capabilities. The "custom" button allows you to enter your own format. You should first select a similar format and then customize it. This will set the other necessary info for you (e.g. the data type). For example, you can select a numeric format with a leading sign,

then customize it to have a trailing sign by simply editing the given format. The Separator characters are the special characters which appear in a numeric format mask. The Replacement strings specify what gets substituted for plus and minus signs. Also, you can specify alphabetic upshift or downshift for any type of data.

3) Input Validation allows you to specify ranges of valid values which the entered data is tested against. Each range must be complete, that is, have a min and max value. Someday, missing values will be assumed to mean negative or positive infinity, but that is not done yet. Also, you can specify a minimum and maximum number of characters to be entered by the user. The data type is the same as that in the Output Formatting View.

4) Error Messages allows you to change the text for the errors reported when input validation and output formatting criteria are not met during application execution.

Note: it is very important to have the data type for your formatting and validation set correctly. Range checking varies based on whether the data is alphanumeric, numeric, or date/time.

The object .m .c .h and .o files and the loadable palette are in directory: /Net/gambit/ISLibrary/IT/DevelopmentTools/Palettes/TextFieldPlus

There is no READ.ME file at the moment, but there will be someday. Any questions, comments, or suggestions are welcome.

Here in IS, we are starting to use TextFieldPlus for Database related applications. So examples of its usage will be available in the near future.

Have fun,
Dana

4MB SIMMS

Bill Smith

To install 4MB SIMMS in a cube, assuming they are the sort with chips mounted horizontally (these are somewhat taller than the 1MB SIMMS as you must know), you must have 4 or 8, or 12 of them (it is rather more work to install 16). Pull out the motherboard. If you have 16 1MB SIMMS, you will have to remove the ones starting with socket 15 (sockets are numbered 0 to 15). Socket 15 is the one closest to the end of the board with the external connections on it (ethernet T connector, etc.). If you don't have 16 1MB SIMMS installed, you should remove enough to use up whatever amount of 4MB SIMMS you have available up to 12 sockets.

Once you have your SIMMS installed, the board should have 1MB SIMMS in sockets 0-3 at least (perhaps 0-7, etc.). Now looking at the open back of the cube, you will see two screws at the bottom holding in the drive/power supply case. Remove these two screws and carefully pull the drive case out of the cube. If you have never done this before, it could be a bit stiff but should slide right out after the initial pull. You probably have some kind of hard drive installed so you will need to remove at least one of the mounting screws for the hard drive (not the optical). If you install 12 of the 4MB SIMMS, you must remove both screws on the "board side" of the drive case and replace them with flat head screws. You **must** remove one screw in any case. This is the one (facing the back of the cube) on the right side closest to the back (i.e., closest to the back cover of the cube which you have removed to do this!)- be sure to check the other drive mounting screws to see that they are tight. The remaining three screws will provide sufficient support for the drive (I have a big WREN in my cube and things work fine).

Now start the drive case back in to the cube about 1/4 of the way and then start the motherboard back in to the cube, connecting the drive cables back to the motherboard while the motherboard is a few inches further out than the drive case. Now slide the motherboard 1/4 the way into the cube until it is even with the drive case, then **slide them into the cube together.** The fit is snug, but there is a **very** small amount of space between the SIMMS and the drive case when everything is back together. (If you are nervous about having your hard drive mounted with only 3 screws you can go out and buy a flat head screw to replace the standard round head you removed.) Press both the motherboard and the drive case firmly into their connectors at the front of the cube. Put the drive case screws back in. Reconnect the fan cable to the fan and without screwing in the backplate screws, hook up the monitor cable to the motherboard, plug in the power cord and start the machine.

It does seem to be somewhat common to get bad 4MB memory SIMMS so watch the boot on the ROM monitor. If you get error messages about memory, or the monitor doesn't light up, or something else is weird, it is probable that you have one or more bad SIMMS. Sometimes at boot the ROM monitor will tell you which sockets have bad memory, and sometimes it won't. Bad memory can also lead to strange things happening with apps dying unexpectedly or the windowserver dying, etc.

If nothing is wrong with the boot, you may get a message about different size memory being installed in various blocks-this is ok, the ROM will keep track of this and you won't get a second message on another boot. Watch the boot process a couple of times. If every thing is ok, turn off the machine and tighten the screws on the backplate. Hook up the rest of your stuff (printer, ethernet, etc.) and you've got more memory.

I have 8 1MB SIMMS and 8 4MB SIMMS in my cube. Works like a champ, except one of the 4MB SIMMS went bad once a couple of months ago, and the machine would hang all time. Watched a boot, and the monitor told me I had a bad SIMM in socket 14. Replaced it and have never had any more trouble. My big jobs don't use much swap space now, and things generally work much faster. Also, you can reinstall the same way on your upgrade board if you decide to go that route.

-Bill-

Interface Builder Connextions

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Hi There!!

This is the first of what I hope are many installments of "Edney-at-large" (or some other such tripe). In today's installment, we are going to be talking about Interface Builder connections and how to do them. Have you ever wondered how Interface Builder does those connections *across window boundaries?* This topic has been bandied about in many different groups and such so that everyone knows **how** it was done. But, I haven't actually seen any code (in the public domain) that does it, so I decided to write my own and offer it as freeware (or beerware if somebody really uses it in a shipping product.)

So now to the task at hand. First of all, in case you haven't been a part of the ongoing discussions about IB connections, let me tell you how Jean-Marie (author of IB) did it. Those little lines that stretch to connect things are really long, thin *windows*. They have to be. You can't draw outside of windows on the NeXT, so you can't drag actual lines from one window to another. The connector windows have an extremely simple view in them that fills the whole window with black. Then, as the user drags, the windows are moved and resized. That's how he did it (thanks to Andrew Stone who let me in on "the secret").

Now, how to actually duplicate what Jean-Marie did. (What **is** it about NeXT that I feel comfortable calling everyone by their first name. It must be because everybody calls Steve "Steve".)

Before anything else, here's how to use the IBpalette included with the source for ConnectorView. Load the palette into Interface Builder and drag a ConnectorView into any window. Inspect the ConnectorView and set how wide you want the connection to be. (Be sure to click "OK" in the inspector window. I alway forget to do this.) Flip into test mode and mouseDown in that view while holding down the Control key. You will drag a connection out. If you drag a connection between two of these views, and drop it into the receiving view, you will get a neat dialog box. That's all there is to it. Not really useful for doing any real work, but subclasses of this could be **extremely** useful. In that sense, this is almost an abstract superclass. (Hey, wow, I used one of those neat object-oriented terms!!!)

What I decided to do was make up a view called "ConnectorView", that would allow people to drag connections within views, between views within the same window and between views in different windows. For this, I stole code from several places, most notably Jayson Adams' example "WhatADrag." The only problem with "WhatADrag" is that it uses a special subclass of window, which would have been unwieldy in an IB environment. I wanted to do everything from within the view, and so I have.

I am currently in the process of submitting this palette, as well as the source, to the FTP archive sites. (By the way, let's get some more palettes on the archive sites, folks. This is the future of software.) It should be there by the time you read this.

Are we ready to dive into the code itself? Sure we are...

First, we create the view that will fill the window. I have a view I call BlackenView that does this. It is a Real Simple View:

Header:

```
#import <appkit/View.h>

@interface BlackenView:View
{
}
- drawSelf:(NXRect *)rects :(int)count;

@end
```

Code:

```
#import<dpsclient/wraps.h>

#import "BlackenView.h"

@implementation BlackenView

- drawSelf:(NXRect *)rects :(int)count
{
 PSsetgray(NX_BLACK);

 NXRectFill(&bounds);

 return self;
}

@end
```

Now we create what I call the ConnectorView. Read that as being The Real Code: Before we do anything, here's the header file for this class:

```
#import <appkit/View.h>

/* The structure that holds our hit
rectangles. Instances of these are known
as "acceptors" */
typedef struct _ViewRectPair {
 id view;
 NXRect   rect;
 } ViewRectPair;

@interface ConnectorView:View
```

```
{
 ViewRectPair *startAcceptor;
 /* The acceptor that we start with */
 id       viewRectList;
    /* Our own rectList */
 id       globRectList;
    /* The global rectList */

 /* The various "long, thin" windows and
rectangles for them */
 id       vertWindow,
horizWindow,mDownWindow;
 NXRect      vertWinRect,horizWinRect,mD
ownRect;

 /* How thick we want the connection to
be */
 float       connectionWidth;

}

/* donor methods */
- awake;
- registerRect:(NXRect *)rect
forView:view;
- buildGlobalRectList;
- (ViewRectPair
*)checkForAcceptRect:(NXPoint)thePoint;
- drawSelf:(NXRect *)r :(int)count;

- (float)connectionWidth;
- setConnectionWidth:(float)theWidth;

- (id)viewRectList;

- (BOOL)acceptsFirstMouse;
- mouseDown:(NXEvent *)theEvent;
-
dragConnectionUsingStartPoint:(NXPoint)s
tartPoint;
- mouseWentDown:(ViewRectPair
*)acceptor;

/* acceptor methods */
- mouseCameIn:(ViewRectPair *)acceptor;
- mouseWentOut:(ViewRectPair *)acceptor;
- mouseDropped:(ViewRectPair
*)fromAcceptor :(ViewRectPair
*)toAcceptor;

/* inspector methods */
- (const char *)inspectorName;

/* read and write methods */
- read:(NXTypedStream *)stream;
- write:(NXTypedStream *)stream;

@end
```

OK, here we go:

First, because I am making this into a loadable palette, I created an "awake:" method. (Thanks to Mai Nguyen at NeXT for lots of help with this confusing subject.) This is the method that IB sends both when you drag a view in from a palette and plop it into the window AND when you flip into Test Interface mode.

```
- awake
{
 /* Allow our superclass to awake */
 [super awake];

 /* Create a list to hold our local list
of rectangles */
 viewRectList = [[Storage alloc]
initCount:0

elementSize:sizeof(ViewRectPair)
               description:"{@ffff}"];

 /* THIS IS FOR USING THIS CODE IN THE
IB PALETTE ONLY */
 /* Take this out for real applications
where you are registering meaningful
rects */
 [self registerRect:&bounds
forView:self];

 return self;
}
```

Second, we have to have a way to register "hit rectangles" in our view so that we can see if they're under the mouse when the button goes down. If this code looks somewhat familiar, it's because this stuff is stolen directly from Jayson Adam's WhatADrag example in NextDeveloper/Examples (that's what they're there for, to steal from):

```
/* Add the view-rect pair to our own,
local, list */
/* NOTE: Rects MUST be registered in
their own local view's coordinates */
- registerRect:(NXRect *)rect
forView:view
{
 ViewRectPair    *newViewRect;

 newViewRect = (ViewRectPair
*)malloc(sizeof(ViewRectPair));
 newViewRect->view = view;
 newViewRect->rect = *rect;

 [viewRectList addElement:newViewRect];

 return self;
}
```

Third, we do the actual mouseDown method that will handle our drawing. This code creates three windows that will be displayed above every other window on the screen. One of the windows, "mDownWindow" is the square that is placed on top of the rectangle in which the mouse went down. The other two are the long, thin windows that the user actually drags around.

These windows are created as NX_BUFFERED although NX_RETAINED will work as well. (I do some manual flushing later on, although I'm not sure this actually helps performance. Any suggestions?) Note that these are instance variables, because I need to use them later on in another method. Here is the lovely code to achieve placing these windows on screen:

```
- mouseDown:(NXEvent *)theEvent
{
 NXRect      tempContRect;
 id       vertView, horizView,mDownView;
 NXPoint     mouseDownPoint;
 float       mDownOffset = 0.0;

 /* Allocate and build the global
rectangle list for all the hit
rectangles
     in all the views in all the windows
of the application */
 globRectList = [[Storage alloc]
initCount:10

elementSize:sizeof(ViewRectPair)
              description:"{@ffff}"];
 [self buildGlobalRectList];

 /* Get the point at which the mouse
went down */
 mouseDownPoint = theEvent->location;

 /* Convert the point from window's base
coord system to screen coord system */
 [[self window]
convertBaseToScreen:&mouseDownPoint];

 /* Check our GLOBAL rectangle list and
set our startAcceptor */
 startAcceptor = [self
checkForAcceptRect:mouseDownPoint];

 /* If there was a "hit rect" beneath
our mouseDown point AND
     the user was holding down the
control key, go into our drag loop */
 if ((startAcceptor) && (theEvent->flags
& NX_CONTROLMASK))
 {
    /* Highlight the rect we went down
in */
    [self mouseWentDown:startAcceptor];

    /* Set up the vertical window */
    NXSetRect(&vertWinRect,mouseDownPoin
t.x,mouseDownPoint.y,
```

```
        connectionWidth,0.0);
     [Window getContentRect:&tempContRect
           forFrameRect:&vertWinRect
           style:NX_PLAINSTYLE];
     vertWindow = [[Window alloc]
initContent:&tempContRect

     style:NX_PLAINSTYLE  /* We don't
want a title bar */

     backing:NX_BUFFERED

     buttonMask:0

     defer:NO];
     vertView = [[BlackenView alloc]
initFrame:&vertWinRect];
     [vertWindow
setContentView:vertView];
     /* We don't have any overlapping
subviews in the window, so we can use
     optimized drawing */
     [vertWindow
useOptimizedDrawing:YES];

     /* Set up the horizontal window -
same initialization as vertical */
     NXSetRect(&horizWinRect,mouseDownPoi
nt.x,mouseDownPoint.y,

        0.0, connectionWidth);
     [Window getContentRect:&tempContRect
           forFrameRect:&horizWinRect
           style:NX_PLAINSTYLE];
     horizWindow = [[Window alloc]
initContent:&tempContRect

     style:NX_PLAINSTYLE

     backing:NX_BUFFERED

     buttonMask:0

     defer:NO];
     horizView = [[BlackenView alloc]
initFrame:&horizWinRect];
     [horizWindow
setContentView:horizView];
     [horizWindow
useOptimizedDrawing:YES];

     /* Calculate mDownOffset to handle
centering the box around the point
clicked */
     mDownOffset = connectionWidth * 3.0;

     /* Set up the box window */
     NXSetRect(&mDownRect,mouseDownPoint.
x - connectionWidth,

        mouseDownPoint.y -
connectionWidth,

        mDownOffset, mDownOffset);
     [Window getContentRect:&tempContRect
           forFrameRect:&mDownRect
           style:NX_PLAINSTYLE];
     mDownWindow = [[Window alloc]
initContent:&mDownRect

     style:NX_PLAINSTYLE

     backing:NX_RETAINED

     buttonMask:0

     defer:NO];
     mDownView = [[BlackenView alloc]
initFrame:&mDownRect];
     [mDownWindow
setContentView:mDownView];

     /* Now, order the windows in the
front of every other window */
     [vertWindow orderFront:NULL];
     [horizWindow orderFront:NULL];
     [mDownWindow orderFront:NULL];

     /* Display them */
     [vertWindow display];
     [horizWindow display];
```

```
     [mDownWindow display];

     /* Start dragging 'em around! */
     [self
dragConnectionUsingStartPoint:mouseDownP
oint];
  }
  else
     /* Otherwise, pass on the event to
the next responder */
     [nextResponder mouseDown:theEvent];

  return self;
}
```

Note that here we are using two methods to check for rectangles. The way I did this was the most global I could think of. Go to each window in the app. Go to each subview within each window and ask for its list of rectangles. Build a global list of all the rectangles in all the views in all the windows of the application. Then test that list against the global mouse point. What this allows for is connections to be formed between multiple "hit" rectangles within the same view, between multiple views in the same window and between multiple windows in the same app. Anyway, here are the two routines that do the bulk of that work (first we build the list, then check against it)

```
- buildGlobalRectList
{
  ViewRectPair
     *oldPair;
  ViewRectPair
     *newPair;

  id winList, theWindow;
  int   winNum;
  id viewList, theView;
  int   viewNum;
  id hitList;
  int   hitNum;

  int   i,j,k;

  i = j = k = 0;
  winNum = viewNum = hitNum = 0;

  winList = [NXApp windowList];
  winNum = [winList count];
  if (winNum > 0)
  {
     for (i = 0;i <= winNum-1;i++)
     {
        theWindow = [winList objectAt:i];
        viewList = [[theWindow
contentView] subviews];
        viewNum = [viewList count];
        if (viewNum > 0)
        {
           for (j = 0;j <= viewNum-1;j++)
           {
              theView = [viewList
objectAt:j];
              if ([theView
respondsTo:@selector(viewRectList)])
              {

  hitList = [theView viewRectList];

  hitNum = [hitList count];

  if (hitNum > 0)

  {

     for (k = 0; k <= hitNum-1;k++)

     {

        oldPair = (ViewRectPair
*)[hitList elementAt:k];

        newPair = (ViewRectPair
*)malloc(sizeof(ViewRectPair));

        newPair->view = theView;

        newPair->rect = oldPair->rect;

           [globRectList
```

```
addElement:newPair];

     }

     oldPair = newPair = NULL;

  }
               }
           }
       }
     }
  }

  return self;

}



- (ViewRectPair
*)checkForAcceptRect:(NXPoint)thePoint
{
  int
  numViewRects;
  ViewRectPair
     *vrPair;
  int
  i;
  NXPoint
  globPoint;

  /* Get the number of elements in our
globRectList */
  numViewRects = [globRectList count];

  globPoint = thePoint;
  for (i = 0; i<= numViewRects-1;i++)
  {
     /* Get the element and convert the
global point into a local view one */
     vrPair = (ViewRectPair
*)[globRectList elementAt:i];
     [[(vrPair->view) window]
convertScreenToBase:&thePoint];
     [(vrPair->view)
convertPoint:&thePoint fromView:nil];
     if (NXPointInRect(&thePoint,
&(vrPair->rect)))
          return (vrPair);

     /* Reset the point to the global
point for the next test */
     thePoint = globPoint;
  }

  return NULL;
}
```

Ok, we've set up our windows, initially displayed them on the screen, built our rectangle list, and now we have to allow the user to start dragging them around and testing for hit rectangles. I've already shown you the code to test. Here is the code to do that actual moving of the windows.

It would seem at first that this is pretty easy, just use the x and y of the mouse point to size and move the windows. Alas, nothing in this world is easy, nothing in this life is that straightforward. I wanted to do a faithful IB implementation of this, and in order to do that, the windows have two different ways of acting.

Whatever direction the user starts in (horizontal or vertical), that window is stretched while the other one is moved. Look closely at how IB does it and you'll see what I mean. So, I have to detect this and handle it accordingly. Also, the user can go back into the "start box" and come out in a different direction in the same drag loop. So, one has to account for that as well. It turns out that while the logic for doing this is pretty simple (see which side of the rectangle she pulled the mouse out of - that's your stretched one), the code to do it is not. Anyway, here we go:

```
-
dragConnectionUsingStartPoint:(NXPoint)s
tartPoint
{
  int          mask;
  NXEvent      *event;
  BOOL      moveHoriz = NO,moveVert = NO;
  NXPoint      currentPoint;
```

```
  ViewRectPair
  *newAcceptor = NULL;
  ViewRectPair
  *oldAcceptor = NULL;

  /* get mouse-dragged events also (and
save original mask for later) */
  mask = [window
addToEventMask:NX_MOUSEDRAGGEDMASK];

  /* Make the current point equal to the
starting point */
  currentPoint = startPoint;

  do /* While we're dragging the mouse */
  {
     /* Check to see if the mouse point
is in the "start box" */
     if
(NXMouseInRect(&currentPoint,&mDownRect,
NO))
     {
        for (;;)
  /* Cycle through until the user comes
out */
        {
           if
(!NXMouseInRect(&currentPoint,&mDownRect
,NO))
           {
              if ((currentPoint.y >
(mDownRect.size.height +
mDownRect.origin.y))

  || (currentPoint.y <
mDownRect.origin.y))
              {

  /* She came out vertically, move the
horizontal */

     moveVert = NO;

     moveHoriz = YES;

     break;   /* Break out of this bloody
loop */
              }
              else
  if ((currentPoint.x >
(mDownRect.size.width +
mDownRect.origin.x))

  || (currentPoint.x <
mDownRect.origin.x))
              {

  /* She came out horizontally, move the
vertical */

  moveVert = YES;

  moveHoriz = NO;

  break;   /* Break out of this bloody
loop */
              }
           }

           /* Get the next event */
           event = [NXApp

  getNextEvent:NX_MOUSEDRAGGEDMASK|NX_MOU
SEUPMASK];
           currentPoint = event-
>location;
           [[self window]
convertBaseToScreen:&currentPoint];
        }
     }

     if (moveVert == YES)
  /* We're moving the vertical, calc both
windows origins */
     {
        vertWinRect.origin.x =
currentPoint.x;
        horizWinRect.origin.y =
startPoint.y;
     }

     if (moveHoriz == YES)
```

```
 /* We're moving the horizontal, calc
both windows origins */
     {
        vertWinRect.origin.x =
startPoint.x;
        horizWinRect.origin.y =
currentPoint.y;
     }

     /* Now, calculate the other origins
and the extents of the windows */
     if (currentPoint.y > startPoint.y)
     {
        vertWinRect.origin.y =
startPoint.y;
        vertWinRect.size.height =
currentPoint.y - startPoint.y +
connectionWidth;
     }
     else if (currentPoint.y <
startPoint.y)
     {
        vertWinRect.origin.y =
currentPoint.y;
        vertWinRect.size.height =
startPoint.y - currentPoint.y;
     }

     if (currentPoint.x > startPoint.x)
     {
        horizWinRect.origin.x =
startPoint.x;
        horizWinRect.size.width =
currentPoint.x - startPoint.x +
connectionWidth;
     }
     else if (currentPoint.x <
startPoint.x)
     {
        horizWinRect.origin.x =
currentPoint.x;
        horizWinRect.size.width =
startPoint.x - currentPoint.x;
     }

     [vertWindow disableFlushWindow];
  /* Does this stuff really improve
performance? */
     [horizWindow disableFlushWindow];
  /* I don't know */

     /* Place and display our windows!!!
*/
     [vertWindow
placeWindowAndDisplay:&vertWinRect];
     [horizWindow
placeWindowAndDisplay:&horizWinRect];

     [vertWindow reenableFlushWindow];
  /* More supposedly performance
improving stuff */
     [horizWindow reenableFlushWindow];
  /* Hard to tell with an '040 board */

     [vertWindow flushWindow];
     [horizWindow flushWindow];

     /* See if the mouse point is in
another acceptor */
     newAcceptor = [self
checkForAcceptRect:currentPoint];

     /* If there isn't a newAcceptor, but
there was an old one, tell the old one
          we left it */
     if ((newAcceptor == NULL) &&
(oldAcceptor))
           [self
mouseWentOut:oldAcceptor];

     if (newAcceptor)
  /* If there is a newAcceptor, tell it
we came into it */
        [self mouseCameIn:newAcceptor];

     oldAcceptor = newAcceptor;
     /* Make the old acceptor equal to
the new one */

     /* Get the next event to process */
     event = [NXApp
getNextEvent:NX_MOUSEDRAGGEDMASK|NX_MOUS
EUPMASK];
```

```
    currentPoint = event->location;
    [[self window]
convertBaseToScreen:&currentPoint];
  }
  while (event->type == NX_MOUSEDRAGGED);

  /* No longer need mouse dragged events,
so reset the event mask */
  [window setEventMask:mask];

  /* If oldAcceptor exists, tell ourself
that the user let go of the mouse */
  if (oldAcceptor)
  {
    /* Tell ourselves that the mouse was
dropped in an acceptor */
    [self mouseDropped:startAcceptor
:oldAcceptor];

    /* Hide and free the connection
windows */
    [[vertWindow orderOut:self] free];
    [[horizWindow orderOut:self] free];
    [[mDownWindow orderOut:self] free];

    [oldAcceptor->view display];
    /* Call the acceptor's "drawSelf" to
paint over its boxes */

    /* Free our GLOBAL rectangle list */
    [globRectList free];
  }
  else
  {
    /* Hide and free the connection
windows */
    [[vertWindow orderOut:self] free];
    [[horizWindow orderOut:self] free];
    [[mDownWindow orderOut:self] free];

    /* Free our GLOBAL rectangle list */
    [globRectList free];
  }

  [self display];
        /* Call our "drawSelf" to
paint over our boxes */

  startAcceptor = NULL;
    /* We're done with the
startAcceptor, so set it to null */

  return self;
}
```

This last piece of code is what actually does the work in the object. There are several others that play a supporting role (what happens when the mouse point enters them, what happens when the mouse point exits, read and write for the object, etc.), but they are minor players. I have listed them here for completeness:

```
- mouseWentDown:(ViewRectPair *)acceptor
{
  /* The mouse went down, highlight the
starting acceptor */
  [acceptor->view lockFocus];
  PSsetgray(NX_BLACK);
  NXFrameRectWithWidth(&(acceptor-
>rect),connectionWidth);
  [[acceptor->view window] flushWindow];
  [acceptor->view unlockFocus];

  return self;
}

- mouseCameIn:(ViewRectPair *)acceptor
{
  /* We don't the starting ViewRectPair
to highlight */
  if ((acceptor == startAcceptor) &&
  (NXEqualRect(&(acceptor-
>rect),&(startAcceptor->rect))))
     return self;

  /* Lock focus on the view and highlight
it */
  [acceptor->view lockFocus];
  PSsetgray(NX_BLACK);
  NXFrameRectWithWidth(&(acceptor-
```

```
>rect),connectionWidth);
  [[acceptor->view window] flushWindow];
  [acceptor->view unlockFocus];

  return self;
}

- mouseWentOut:(ViewRectPair *)acceptor
{
  /* We don't the starting ViewRectPair
to unhighlight */
  if ((acceptor == startAcceptor) &&
  (NXEqualRect(&(acceptor-
>rect),&(startAcceptor->rect))))
      return self;

  /* Unhighlight the view */
  [acceptor->view display];
  [[acceptor->view window] flushWindow];

  return self;
 }

- mouseDropped:(ViewRectPair
*)fromAcceptor :(ViewRectPair
*)toAcceptor
{
  int   result = 0;

  /* We don't the starting ViewRectPair
to get its own connection */
  if ((fromAcceptor == toAcceptor) &&
  (NXEqualRect(&(fromAcceptor-
>rect),&(toAcceptor->rect))))
      return self;

  /* Bring up an alert panel */
  result = NXRunAlertPanel(NULL,"You just
connected something","Yi
doggie!",NULL,NULL);

  return 0;
}

- (const char *)inspectorName
{
  /* Return the name for the IB inspector
*/
  return "ConnectorViewInspector";
}

/* We only read and write
"connectionWidth" here. You might want
to do others */
- read:(NXTypedStream*)stream
{
  [super read:stream];
  NXReadTypes(stream,"f",
&connectionWidth);

  return self;
}

- write:(NXTypedStream*)stream
{
  [super write:stream];
  NXWriteTypes(stream,"f",
&connectionWidth);

  return self;
}

@end
```

Now that most of the bugs are gone (hopefully), I will release this code into the public domain, which will contain both the source and an IB palette. (Those palettes are coming, Erica, hang on. I've got two more in the works!)

Have a good one and start making connextions!!

P.S. In the future, look for a subclass of ConnectorView that will allow linking pieces of text together. (Can you guess what I'm doing? Can you say hypertext?)

Bio: Bill is a NeXTnut who works on a NeXT by day at Los Alamos National Lab and works on a NeXT by night for a very secretive company called Firstsoft. Look for an innovative product coming from Firstsoft in a couple of months

(Hint: think of a very-NeXTlike way to write C shell scripts).

Bill firmly agrees with William Adams of Adamation as quoted in the premier issue of NeXTWorld: "We knew that even if it involved processing horse manure, if Steve Jobs was doing it, it would be new and important to the world, and we didn't want to miss out." Bill has to go study his German now.

NeXT Users' Journal Manifesto

Changes, Goals, Directions

It is the goal of the NeXT Users' Journal to deliver intelligent, well-written articles to an audience of technical readers. We focus on how-to, review and NeXT-information articles. We seek feedback and articles from our readership.

We look for custom objects, application code, disk-tabs, and any other NeXT related code snippets. Hints are eagerly welcomed.

Authors Rewarded

We very much need regular columnists as well as good technical writers. And we are prepared to reward those who pitch in. As soon as we can get our not-for-profit status fixed and can start taking in money, we will be using some of these funds to say "thank you" to our writers, staff and interviewees. For anyone submitting two technical articles, four columns or donating money in excess of $100 to BuzzNUG, we will send you an adorable stuffed *Buzz* in appreciation.

Mailed NUJ

We will now also produce mailed DOS-disk based versions of the NeXT Users' Journal for $36 for six issues (however long that is, anywhere from six months to twelve!). This means that we may have to cut some pictures from your 360 or 720 Kbyte disks to make 'em all fit. However, we will include advertising in mailed versions.

The monies received for mail subscriptions cover only materials and labor for mailing -- we also ask our mailed subscribers to join in our fundraising efforts through pledges. Send checks to Erica Liebman/1150 Collier Road NW L-12/Atlanta, GA 30318. Checks will not be cashed until we get set up financially as not-for-profit. If someone donates any other disk drive, we will offer those formats too.

Pledges

In order to pay for things like toner, paper, labor, etc, We are asking that our readers : from the sites and through direct mail make generous pledges on a *can-afford-to* basis. Think of this as a kind of Shareware-PBS-Newsletter-Drive. We are asking for pledges of $15/year for students, $30 and way, way, up for people who are actually pulling in salaries. For any pledge, I'll mail you out a *Buzz* related bumpersticker. Over $100 and you get an adorable stuffed *Buzz.* If you are looking for something more in the line of Tech t-shirts, etc then write or call and we'll negotiate. As before, no checks will be cashed until we get the not-for-profit set up, but do start sending checks in. All pledgees will be listed at the end of each issue (unless you request otherwise) as a special 'thank-you'.

Advertising

We will start to carry advertising in mailed issues. Due to the size limitations of the DOS distribution media, advertisements must be basic postscript or rich-text to start with. (In other words, no scanned images -- yet!) Advertisers will be listed as sponsors in the Internet version because 1. they are and 2. it is inappropriate to distribute advertising over Internet. Our starting basic rates per page per issue : 1/4 page $150 (sponsor), 1/2 page $ 250 (generous donor), 1 page $400 (honor list). These rates will go up or down in a half a year, depending on how much surplus or deficit money we are carrying at that time. Again, no checks will be cashed until we are set up as not-for-profit but do send them in.

Review Materials

If you are a 3rd party developer, please do send in review materials to the address above. We will make every effort to get your product reviewed in the next issue. Upcoming reviews : **Mathematica : Quick Reference**, **Lotus Improv** and **Diagram!**

Software/Hardware Loaners and Donations

The BuzzNUG staff can really use donations and loaners of Hardware and Software materiels. Donations are not tax-deductible, but will be greatly appreciated and treated as Pledges (and you will be sent an adorable stuffed *Buzz*), and we will gratefully thank you at the end of each issue. Please contact me at the above address.

The Evolving Manifesto

As, and when, appropriate, more administrivia will be published in this column. So keep your eyes peeled.

And to every one of you who have helped out, pitched in and made this group effort a real success, all of us here at Tech say THANK YOU!

USER GROUPS

Conrad Geiger

This is the official issue of the NeXT User Groups Directory. The Golden Nugget Award winning user groups have a "!" before their name. These groups are recognized for their outstanding contribution to the NeXT community.

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NeXus Memo, monthly newsletter

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Classroom: NeXT Courseware SIG
Email: send the following text message to MAILSERV@gac.edu -
"Subscribe next-classroom <your name>"

Medical: NeXTMed SIG

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Email: NeXTMed-request@
ulnar.biostr.washington.edu

Music: NeXT Music SIGs (two of them!)
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silvertone.Princeton.edu
and
next-music-request@usc.edu

Network and Security Management for
Installed Labs and Large Installations
Email: next-lab-request@cs.ubc.ca

Programmers: NeXT Programmers SIG
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Room B-51 of NIH Complex in Bethesda,
Md. at 7:30PM

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NeXT Users' Journal, newsletter
Editor-in-Chief, Erica Liebman
(Issues run forty to sixty pages)

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Oregon State University NeXT User Group
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Meet second Thursday of month at 2:30pm in Milne Computer Center, Faculty Development Lab

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Meet the last Thursday of the month
at Bozell, Inc. at 201 Carpenter Frwy from
7 to 9 PM

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Meet first Wednesday of the month at the
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Walter Daugherity, Vice President
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Meet third Wednesday of month at 3:30PM

in Parrington Hall, room 106 on the
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Email: gerkman@bongo.csc.wsu.edu or
gerkman@wsuvm1.bitnet

Other NeXT related User Groups

Mathematica: Special Interest Group
Email: mathgroup-request@
yoda.ncsa.uiuc.edu

Frame: FUN (Frame Users Network)
Email: framers-request@drd.com

NeXT Bulletin Board (comp.sys.next)
Archive to subscribe: email text "SUBSCRIBE
NeXT-L" to
LISTSERV@BROWNVM.BROWN.EDU

For further information on how to start your NeXT Group, email to the following address
user_groups@next.com

AVAILABLE

Chuck Herrik

The following is a partial listing of products for the NeXT. This is not an official publication of NeXT Computers, Inc. and no warranty, either express or implied, is given. Up-to-date info is always welcome. Copies for review are encouraged.

ANALYTICAL

- Affinity Systems (316.636.5100):
Tactician Plus (multiuser spreadsheet)
- Ashton-Tate (800.437.4329):
PowerStep (spreadsheet)
- Informix (913.599.7100):
INFORMIX-TURBO (database engine for OLTP)
Wingz (spreadsheet)
- Ingres (800.446.4737):
RDBMS (database)
- KnowledgeSet Corp (415.968.9888):
KRS (database search and retrieval)
- Lotus (617.577.8500):
Improv (spreadsheet)
- Microstat (604.228.1612):
OMEN III (investment information retrieval and manipulation)
- Oracle (800.345.3267):
RDBMS (database)
- Professional Software (617.246.2425):
Objective DB Toolkit (30 classes link NeXT to Sybase)
- SAS (919.677.8000):
statistical analysis and presentation software
- Stone Design (505.345.4800):
DataPhile (database)
- Sybase (800.879.2273):
SQL Server (database)
- Triakis (505.672.3180):
DAN (data analysis and plot system)
- Wolfram Research (217.398.0700):
Mathematica (mathematical analysis)

PUBLISHING

- Abaton (800.444.5321):
Scan 300/GS (scanner)
- Adobe (415.961.4400):
Illustrator, Plus Pack, SmartArt
- Altsys (214.680.2060):
Stealth (advanced drawing, graphic arts)
- Canon (800.848.4123):
IX-30F Image Scanner (scanner)
- Data Transforms (303.832.1501):
InDia (graphical decision-making)
GEMS (flexible modeling system, ex: economics)
- Epitome(615.675.0910):
Redline (multiple reviewer)
- Flash Graphics (415.331.7700):
Flash Graphics (screen, slide, paper presentations)
- Font Company (602.998.9711):
extensive PostScript font library
- Frame Technology (408.433.3311):
FrameMaker (desktop publishing environment)
- HSD (415.964.1400):
Scan-X (scanners, optical character recognition software)
- Innovated Data Design (415.680.6818):
Dreams (drawing and drafting)
- Lighthouse Design (800.366.2279):
Diagram (graphical diagramming)
- Media Logic (213.453.7744)
Artisan (paint and image processing system)
TopDraw (drawing package)
- Quark (303.934.2211):
QuarkXPress (publishing software)
- RightBrain Software (415.851.1785):
TouchType (typesetting; desktop publishing)
- Stone Design (505.345.4800):
ArtDraw, TextArt (desktop publishing)
- T/Maker (we need a phone and address):
ClickArt (PostScript images library)
- WordPerfect (801.225.5000):
WordPerfect 5.0 (word processor)

CONNECTIVITY

- Abaton (415.683.2870):
InterFaxNX (fax modem)

- Active Ingredients (617.576.2000):
Communicae (VT220 and Tektronix 4010/4014 emulation)
- Asante (408.734.4844):
TR/SC (NeXT (SCSI) to Token-Ring)
- Atlantix (800.262.6526):
XWave (integration software, NeXT to PC LANs)
- AVATAR (508.435.3000):
InSession 3270 (IBM 3270 connectivity)
- Cayman Systems (617.494.1999):
GatorBox, GatorMail, GatorShare (NexT to Mac net)
- Conextions (508.475.5411):
3270Vision (IBM 3270 connectivity)
- DataViz (203.268.0030):
MacLinkPlus/PC (NeXT to Mac file transfers)
- HSD (415.964.1400):
OCR (fax software-scanner)
- Morning Star Technologies (800.451.1883):
Synchronous SCSI Communication Interface
- Novell (408.434.2300):
Novell NetWare integration software
- Objective Software Engineering (604.261.0186):
Mirage Fax (fax modem)
- Software Ventures (415.644.3232):
MicroPhoneII, WatchMe, ScriptEditor (telecommunications)
- Touch Communications 408.374.2500):
Worldtalk/400 (X.400 messaging gateways)
- Transarc (412.338.4400):
AFS (distributed file system)

COLOR

- Analytical Graphics (215.337.3055):
STK (Satellite Tool Kit, satellite planning)
- HSD (415.964.1400):
Scan-X Color (color scanner)
- Tektronix (503.221.1063):
Phaser PX (color printer, serial, parallel and AppleTalk ports)
- Oce (800.545.5445):
OceColor (PostScript printer)
- QMS (415.363.4300):
ColorScript 100 (color PostScript printers)

GRAPHICS

- McGill Univ (peterd@cs.mcgill.ca):
X windows 11R4
- Pencom Software (512.343.1111):
X windows 11R4
- Ohio Supercomputer Center (614.292.0006, michelle@osgp.osc.edu):
apE (visualization and image processing package)

SOUND

- Univ. Virginia (uvaarpa.acc.virginia.edu):
CSound-NeXT v2.0 (digital synthesis software interface)

MULTIMEDIA

- Ariel (201.249.2900):
IRCAM (multi-RISC NeXTBus board for vector/signal processing engine)
- Boss Logic (515.472.7740):
Boss DMS (document management software)
- Coda Music Software (800.843.2066):
MusicProse (music notation software)
- DisCopyLabs (415.651.5100):
software duplication services in 2.88 MB format
- Icarus Software (617.247.1350):
LiNK-IT (hypertext system)
- Imagine, Inc (313.487.7117):
MediaStation, MediaBrowser (multimedia database)
FirstChair (MIDI and sound sequencer)
- Knowledge Transfer Intl (214.233.7693):
SimuLEARN (instructional multimedia tool kit)
- Metaresearch (503.238.5728):
Color Digital Eye (high-res. color frame grabber)
Digital Eye, Digital Ears (gray-scale frame, sound grabber)
- NVT (415.285.8744):
High Density Video Drive (video playback device)
- Thoughtful Software (303.221.4596):
HyperCube (hypermedia environment)

- Visus (412.687.3800):
Fax DEMON, PaperSight (fax, document image management system)

HARDWARE
- Ariel (201.249.2900):
QuintProcessor (multiprocessor DSP NeXTBus board)
DM-N Digital Microphone
- Daewoo Telecom (508.836.4800):
Daewoo Graphics & Imaging System (image processing board)
- Dazzl (309.674.9317):
16/12 Analog to Digital Converter (NeXTBus board)
- DIT (505.662.1459):
CubeFloppy 2.9 (floppy, Mac file transfer software)
CubeDigital I/O, SCSI488/N (NeXTBus boards, controllers)
- Extron Electronics (800.633.9876):
Extron Board (NeXTBus large screen projector board)
- IOtech (216.439.4091):
ADC488, DAC488 (A to D, D to A converters)
Digital488/80, Serial488/4 (IEEE to digital, IEEE to serial)
Driver488/N (IEEE488 Obj-C driver)
- Pacific Microlectronics (800.628.3475):
PMHIDE (external SCSI hard disk drive enclosure)
- Pers. Comp. Periph (813.884.3092):
JETSTREAM Tape Backup (high-perfromance tape backup)
- PLI (800.288.8754):
SuperFloppy 2.8, Mach One (floppy, high-speed hard disk drives)
- Singular Solutions (818.792.9567):
A/D64X (analog-digital interface

BUSINESS
- Adamation (415.452.5252):
Live Wire, Who's Calling (business info management)
- Boss Logic (515.472.7740):
Contact! 1.0 (business contact database)
- Chadwyck Healey (800.752.0515):
MundoCart/Optical (cartographic map database)
- DIT (505.662.1459):
OnDuty (office task management)
- Stained Glass Software (408.249.3337):
Calendoscope (appointment calendar program)
- TransGraphics Systems (415.283.5750):
TransManager (terminal management software)

PROGRAMMIMNG LANGUAGES
- Absoft (313.853.0050):
FORTRAN77 (with object oriented extensions)
- Acucobol (619.271.7097):
ACUCOBOL-85 (COBOL)
- ana-systems (415.341.1768):
Modula-2
- Franz Inc (415.548.3600):
AllegroCL (Common Lisp)
- GNU (prep.ai.mit.edu):
C, C++, Objective-C, Smalltalk
- Interactive Software Engineering (eiffel.com):
Eiffel
- Iverson Software Inc (416.925.6096):
J
- Jefferson Software (602.234.3106):
Modula-2
- Motorola (512.891.2030):
DSP 56000 Assembler
- Oasys (617.890.7889):
C, FORTRAN, Pascal
- Plus Five Computer Services (314.426.3900):
MUMPS
- public domain:
FORTRAN-to-C converter
Standard ML (princeton.edu in pub/ml)
- Toltec Human Services (405.840.4254):
UNIX MUMPS
- Univ. Va (804.982.2209):
Uvapc (Pascal)

DEVELOPMENT
- Adobe Systems (415.961.4400):
Displaytalk (PostScript development environment)
- Ariel (201.249.2900):
Bug-56 (DSP debugger)
- ana-systems (415.341.1768):
Documenter's Workbench (troff, etc.)
- Design Technology (info@bydesign.com):
OO-Browser (multi-language object-oriented class browser)
- Information & Communications (800.776.9966):
AKGH (context-sensitive on-line help tool)
- Lighthouse Design (800.366.2279):
Exploder (object-oriented database)
Schematic Entry (EE-CAD tool)
- Motorola (512.891.2030):
SIM56000 (DSP simulator program)
- Objective Technologies (212.227.6767):
[OT Palettes 1.0] (GUI object library/palette)
- ONyX Systems (817.468.2695):
BugByte (graphic interactive symbolic debugger)
- Professional Software (617.246.2425):
Objective DB Toolkit (obj. library, database support)
- Informix (913.599.7100):
Math++ (C-language math library)
- WeDesign Inc (415.479.1105):
TheLibrary (on-line help information system)

MEDICAL
- BioMedical Design Group (612.645.9062):
BioTRACE 8 (8 channel acquisition and monitoring)
- LMER (717.531.7589):
Gray's Anatomy-digital (digital version of Gray's Anatomy)
- Toltec Human Services (405.840.4254):
Transcriber (medical record transcription tool)

OTHER
- Alva Computer (804.851.6830):
Airfoil Design Kit (aerodynamic engineering tool)
- BIX (800.227.2983):
NeXT special interest group
- Boylan Enterprises (404.271.8305):
NeXUS Magazine: (NeXT oriented magazine)
- Baran's Tech Letter (208.265.5286, nbaran@well.sf.ca.us)
(newsletter)
- Deltos Fleet Computing (214.540.2301):
GeoKit (object-toolkit for cartographic map rendering)
- Halchin and Fleming (217.348.0917):
Spring (differential equation modeling program)
Taylor (Taylor polynomial software)
- Insignia Solutions (408.522.7600):
SoftPC (IBM-PC/AT MS-DOS emulator)
- International Data Group:
NeXTWORLD (magazine)
- Lighthouse Design (800.366.279):
Public Domain Disk #1 (asstd pd software)
- NeXTConnection (800.800.6398)
(NeXT-specific mail order)
- public domain:
iwf (ImageWriter II printer-driver) (cs.orst.edu)
JumpBack (backup facility) (sonata.cc.purdue.edu)
News (NeXTstep newsgroup news-reader, Beta) (cs.orst.edu)
- shareware:
iwscript (ImageWriter II printer-driver) (sutro.sfsu.edu)
Stuart (full-featured NeXTstep VT100 terminal app) (cs.orst.edu)
- Software Engineering Solutions (512.343.2828):
AtTheBeep (NeXTstep message handling system)