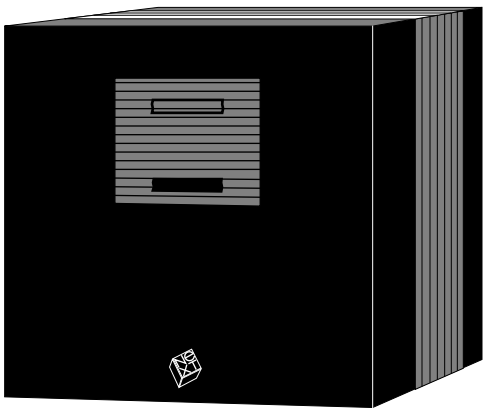
rmNUG

Rocky Mountain NeXT Users' Group Newsletter

August, 1990



Premier Issue!!

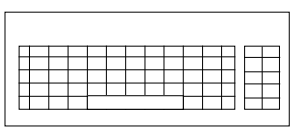
Welcome

Welcome to the first of many rmNUG newsletters. Thanks to the help and expertise of Dave Bowdish, this newsletter is a reality. He and I will be writing and developing this newsletter on a monthly basis. If any of you are interested in taking part; whether simply proof reading or writing any portion of the newsletter, please contact one of us. As this newsletter evolves, we will continually be looking for your support. Any help is appreciated and encouraged.

This month we're featuring an article entitled "Sound and Music on the NeXT Workstation" which gives an overview of the sound and music tools currently available for the NeXT. There are also many articles that describe the activities and direction of rmNUG.

This newsletter will initially address the specific needs of rmNUG and will eventually become of interest to the entire community of NeXT users. We want to make it clear from the beginning that we are not trying to become "yet another BuzzNUG" newsletter. We are sure that we can provide a newsletter that will accompany and supplement a fine journal like BuzzNUG.

By the way, as most of the articles this month are by David Hieb, rmNUG's chairman, any "I" or "me" that you see refers to David and you should direct any questions you have to him. Please see the Users List (page 15) for phone numbers and email addresses.



How About The NUGget?

This is the first issue of the rmNUG Newsletter as you may have noticed, we are currently operating under a generic name. We would like you to help us give a permanent name to this newsletter. If you cannot attend the August meeting, but would like to contribute a name, please contact either Dave Bowdish or David Hieb with your suggestion.

rmNUG's Software Contribution program

Stone Design is the first software company to donate their product to the Rocky Mountain NeXT Users' Group. I'd like to take this opportunity to *personally thank* Andrew Stone for contributing TextArt and at the same time point out some of the capabilities of TextArt. TextArt is an easy to use program which gives you a complete grasp of the power of postscript. It is very easy to combine graphics and text in a new dimension which yields presentation quality materials. You can see the results of TextArt by observing the series of logos that I created for rmNUG (page 7), our new sign-in sheets and parts of this document.

As always, this software package, along with all the others we will be receiving under the contribution program, will be available each meeting for you to use.

Here is the current software wish list for the contribution program:

* Display Talk
* Communicae
* TopDraw

r

m

N

U

G

The rmNUG Newsletter is published monthly by the Rocky Mountain NeXT Users Group.

Readers are encouraged to send their comments or contributions to:

David Bowdish
73340.2146@compuserve.com

Any submissions of letters, artwork, articles, etc. will constitute implied permission for rmNUG to publish (in whole or in part) in print or electronically.

Sorry, but with our budget ($0) we can only afford to offer our sincerest thanks for any contributions you may send.

Special thanks to David Hieb, who spent many late night hours writing the articles for this newsletter. His family's loss was our gain!

Editor:
David J. Bowdish

Contributing Editors:
David R. Hieb and Brad Green

* Click Art
* Adobe Type Library
* Lighthouse Design Compilation Disk

If you would like to see any other programs donated to rmNUG, please speak with me and I will see what can be done.

Beta Site Testing

WordPerfect and Ashton Tate are both in the process of developing software products for the NeXT and are looking for beta test sites. I have spoken with each company and have told them that we would be interested in doing some of the testing. We would be testing WordPerfect's word processor and Ashton Tate's spreadsheet application. If you are interested in either of these products, please contact me.

Users' Night

As previously discussed, we will be having a users' night in the near future. As I see it, we will not have a "special feature" that night, but will instead have SEVERAL computers set up with lots of great software from our software contribution program. That nights meeting will be intended to allow you to sit down and spend some serious time with a software package of your choice. As usual, this will be a good opportunity to talk with our Denver NeXT representatives and have them show us any new software/hardware.

Regular Meeting Times

It has come to my attention that it might behoove rmNUG to meet at a regular time each month. Although the flexibility we have enjoyed so far has not hurt us, I feel that the consistency of a regular meeting time might help stabilize our group even more. This will certainly help each of you as you plan on attending.

I will initially suggest some type of schedule like meeting on the third Thursday of each month, although we will decide upon this at the August meeting were each of you will be able to give your input. If you feel adamant about the issue but will not be able to attend, then feel free to contact me and register your vote.

Available Literature On NeXT related issues

We will have several stacks of NeXT related literature available at each of our meetings. I'm sure the wide variety of topics we are able to provide will in some way interest you. By the way, if you are interested in some literature that you do not see present, contact myself or Brad Green. Here is a listing of the titles.

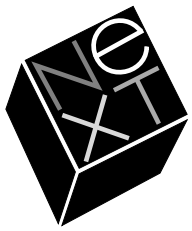
* Third Party Software catalog.
* The classic NeXT introduction booklet.
* The classic NeXT Desktop Publishing booklet.
* Workstation Publishing Samples.
* The MacWeek NeXTWEEK booklet.
* The UNIXWORLD article on the NeXT.
* The MACWORLD article on the NeXT.
* The Personal Publishing booklet.
* The Adobe Type Catalog.
* NeXT On Campus.
* Mathematica booklet.
* DIT's product release featuring the Cube Floppy 1.4.
* Pacific Micro's product release the PM 1.44 Floppy Disk.

User Group Needs

Conrad Geiger, the User Group coordinator for NeXT, has asked me what rmNUG's biggest perceived needs are from NeXT Inc. I have compiled and included my own list from the perspective of a user group leader. I am also very interested in what you feel you would like to see NeXT do for rmNUG. We will discuss this issue at the August meeting and at that time collect your thoughts so they might be sent off as well. If you want your voice to be heard by NeXT, speak up that night or email me.

My four perceived needs from NeXT would have to be:

1) Have NeXT encourage 3rd party developers (and others) to contribute their soft-



ware to qualified (I hope we would be included) user groups. This would really help reduce my time/money spent on trying to convince companies that I run a legitimate group and would also provide our user group with a strong software archive which in my opinion is really important.

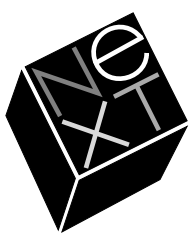
2) Have NeXT encourage their own hot-shot employees (Avie, et. al.) to take the time to be our special features. That would definitely give the user groups a real shot in the arm. Here in Colorado, we sometimes feel like a million miles from the base camp.

3) Have NeXT start developing some type of program whereby qualified user groups would be capable of getting hardware (and software) from NeXT. If it wouldn't be possible to actually give the equipment away, then I wouldn't be opposed to some type of a rotation program where NeXT would rotate equipment around the country on a loaner type basis. It would provide for good meetings and at the same time give the users more time with the equipment.
Ultimately I would like to see rmNUG set up with a large hardware/software combo in a place where the users could get their hands on stuff in between meetings. This setup could then also go to all the meetings.

4) Have NeXT introduce a clear channel between themselves and the user group leaders for providing things of the following nature: News/Announcements and any other information for inclusion in the rmNUG newsletter, promotionals (T-shirts, mouse pads, etc.), brochures (NeXT On Campus, Desktop Publishing, UNIXWORLD, MacWorld, etc.), and maybe even some decorating type of things like banners, tablecloths, and the special trimmings.

"we sometimes feel that we are a million miles from the base camp"

Available Software At The Meetings



The following list of software will be made available for those who brought their Optical Disks. We will continue to add new packages as they are available and keep the most current copies of the ones we advertise. Note that this list will also start to include the projects which have been the special features of past meetings.

I have included the file 'README' from j.cc.purdue.edu (now sonata.cc.purdue.edu) for those of you not familiar with the 'tar' and 'compress' commands.

* Music directory.
* X-Windows directory.
* Tao directory of all issues.
* Comp.sys.next file of NeXT news.
* BuzzNUG directory of all issues.
* NeXT On Campus directory of all issues.
* Gnu directory of all the gnu packages and source.
* NeXT Answers directory of the latest installment.
* Applications directory which the apps. on the Internet.
* Mathematica directory of my Mathematica article/graphics.
* Interface Builder directory of the IB labs from NeXT developers camp.
* GIF directory which contains GIF images and related GIF/PS/TIFF stuff.

NeXT News/Rumors

Page 8 of the July 30, 1990 issue of PC Week has a brief article on the next NeXTs. Their info is based on sources close to the company (i.e., this is officially just a rumor).

"In September NeXT will announce two new machines, both based on the Motorola 68040. Both will include a 2.88Mbyte floppy drive capable of reading IBM-style floppies. Also, both will include a 100MB hard disk. (I dunno how they are going to fit the OS, apps, doc & swap space on it.) Optical disk drives are optional.

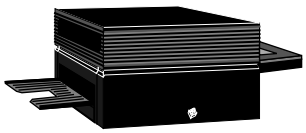
"One will be a monochrome system selling for under $5000. This will be a 'pizza-box' system with no expansion slots.

"The other will be a 32-bit color system, possibly using Renderman graphics. It will sell for under $10 000. I don't know if this is educational or Businessland pricing--probably the latter.

"This is definitely not an announcement by NeXT, but it is a rumor whose substance I believe."

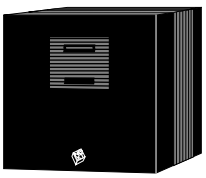
The July rmNUG Meeting

The July meeting of rmNUG was held on the campus of the Colorado School of Mines in Golden. I'd like to thank our members at CSM (especially Aaron Gordon) for making their facilities available to us. We unfortunately had too much business to take care of in the beginning of the evening and ran late the rest of the night (another fine reason for the rmNUG newsletter). After introductions and a discussion period, I presented my Mathematica article. It is my intent that the article will help you take advantage of the power and ease of Mathematica by breaking down any barriers of intimidation that might exist. I was really glad to see that several CSM members were already involved with Mathematica usage to quite an extensive level.



After the special feature we had free time to visit with each other and our friends from NeXT. Aaron Gordon helped out with making sure the users were able to get software copied onto Optical Disks while Mitch Green demonstrated the HSD scanner and PaperSight software, by Visual Understanding Systems, with the Optical Character Recognition software installed.

I'm really happy to see so many of you coming from far away; Doug Simons from Fort Collins and our regular bunch from Colorado Springs. This really shows strong support for rmNUG.



The August rmNUG Meeting

The August meeting of rmNUG will be held in Boulder at the National Center for Atmospheric Research (NCAR). We will be meeting on August 22nd, at 7:00pm, in the main seminar room.

Here are the directions: Take Broadway or 36 to Table Mesa. Head straight towards the Flatirons (west) until the road ends. At this point you will be at the foot of NCAR (a big pink-ish building). Park in the big parking lot, not the little one nearest the front door. Go in the front door and follow the signs to the main seminar room (and enjoy yourself).

Dave Bowdish will be giving a presentation on "Framemaker for Non-Experts". Dave Bowdish is the editor of rmNUG's newsletter and is the owner of Designer Documents. Dave uses FrameMaker extensively in his business and will share his expertise from a user's perspective Frank Hadsell will give a more advanced presentation on using Mathematica in conjunction with Framemaker. Frank is a professor of geophysics at the Colorado School of Mines and also uses FrameMaker extensively in his work.

I'd like to take this opportunity to encourage those of you who have not yet attended a meeting to do so. We are quickly sneaking up on the 6 month mark which is a big indicator to that we aren't just a flash in the pan. Our membership is growing rapidly and I truly believe we are on the verge of doing some very exciting things. So if you are interested in the NeXT, and would like to be a part of an active group of enthusiasts, try coming to a meeting.

September Meeting

As of this date we don't have any solid plans for our September meeting. I would personally like to see something on Postscript from our postscript gurus. Please be thinking of anything that you might be able to present for the September meeting. Thanks to many of you, we haven't had any problem coming up with special features so far.

October Meeting of Rocky Mountain NeXT Users' Group

I am pleased to announce that **Andrew Stone** of Stone Design Corporation will be the special feature for our October meeting. It will be held in Boulder on the 11th at 7:00pm (place to be determined). Andrew Stone is a registered developer for NeXT and is the president of Stone Design Corporation, a software house which sells the TextArt graphics program. Andrew will be discussing the design and utilization of TextArt along with the presentation of the new software project that he is currently developing.

Mail Servers

Mail servers are computer programs designed to receive email and make intelligent decisions based on key words in the subject (or body) line(s). This month we have two mail servers to report which provide NeXT-related software. The first one contains DSP related information/programs and the second is the Adobe postscript file server. Below is a list of internet addresses for the two mail servers and the first message you need to send. The server will then email you back with instructions on how to get more information.

• DSP addresses: dsp@ivucsb.sba.ca.us
ivucsb!dsp@hub.ucsb.edu
ucsbcsl!ivucsb!dsp
ivucsb!dsp@radius.com
DSP lines: send README
send HOWTO

• Adobe address: ps-file-server@adobe.com
Adobe lines:
help —> returns this message.
index —> returns a list of categories.
index <category> —> list files avail. under category
send <category> <file> —> send requested file.
path <mailpath> —> force server to use <mailpath>.

Adobe categories: AFMFiles, Documents, PPDFiles, Programs, and Updates

---

To get more help from the Adobe postscript file server, send the following message to the same address:
"send Documents long.help"

Compuserve Access

For those of you who do not have direct access to the Internet, but do have a modem, you can exchange email with our Internet users in a fairly easy fashion with a Compuserve account. Although this might only be an interim solution (until Colorado Supernet provides Internet access to us), it seems reliable and can be utilized immediately.

Internet to Compuserve:
user#1.user#2@compuserve.com

UUCP to Compuserve:
...!uunet!compuserve.com!user#1.user#2

Compuserve to Internet:
> INTERNET: address

If you already have Compuserve access but still have a U.S. air mail address (instead of email) for your rmNUG mailing list entry, please put your compuserve address on the sign-in sheet.

Here are the only two rmNUG members with Compuserve access that I know of at this time – please contact them if you have questions (see the user list on page 15 for contact information):

Dave Bowdish:
73340.2146@compuserve.com

Warren Jokinen:
73437.3500@compuserve.com

Internet Access

David Menges, of Colorado Supernet, is going to be providing Internet access to computer users in the front range area. He will be giving his presentation at the August rmNUG meeting and will be able to answer questions at that time regarding services and cost. Here is the clipping that he sent me:

Connection services to be offered: login, UUCP, SLIP.

On-line services to be offered: the basic Internet services (email, netnews, ftp, telnet), other Internet services out there (doc and src archives, library access, etc.); some local database services (ex: state demographic information) likely.

When? All equipment has been ordered; goal is login and UUCP about late Aug (for friendly users), full services by early Oct.

Cost? less certainty here; possibilities are "what the market expects" (ballpark login $20/mo, UUCP $75/mo, SLIP $250/mo), or a flat hourly rate regardless of service type.

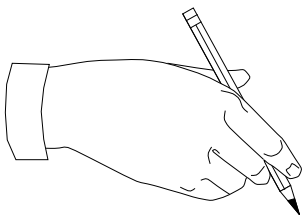
Misc.: competition from national level expected. many other things in the works / up in the air.

From The Editor

Finally! Our newsletter is out. It wouldn't have been possible without the help of David Hieb who wrote most of the articles.

For our next newsletter we would like to hear

"We need your ideas and submissions"



from you. We need your ideas and submissions. We need our own *Siskel and Ebert's* to review hardware and software products for the NeXT Computer, including the freeware and shareware programs which are available.

Also, send us any helpful tips, hints, shortcuts, ideas for articles, NeXT news, unsubstantiated rumors, resources, humor items, new product announcements or anything else you think our readers would find interesting or useful.

We will also accept letters to the editor and NeXT-related classified advertising.

All submissions may be sent to:
Dave Bowdish
73340.2146@compuserve.com

or by U.S. Snail

David Bowdish
3400 South Lowell Blvd.
Denver, CO 80236

User Profiles

Each month we will feature one or two of our members in this column. This will provide a means for you to find out more information about the expertise and interests of our users.

• Dave Bowdish

Dave is the owner of Designer Documents, a desktop publishing and typesetting company here in Denver. Designer documents does most of it's business as a wholesaler for printshops, but also has done some retail work. Dave has owned a NeXT computer since December of 1989 and uses the NeXT as the primary tool in his work. His three favorite software packages are FrameMaker, Communicae and Tetris.

Dave has a Masters degree in Marketing with a minor in Finance from the University of Colorado, Denver. He has lived in Denver since 1983 and as you might be able to tell, is a strong member of rmNUG. Dave is a serious believer in NeXT and really wants to see NeXT succeed. He says he's in the user group for the long run and would like to see his approach to the newsletter set a trend.

• Frank Hadsell

Frank is a professor of geophysics at the Colorado School of Mines in Golden Colorado. Frank's main interest is elastic wave theory but he has been known to get involved in artificial intelligence as well. His favorite software packages are FrameMaker and Mathematica. Frank has owned a NeXT computer since May of 1989 and uses it at home as his work machine. He feels that there is no need to go to work every day when he has the self contained work environment, which the NeXT provides, at home.

Frank feels that he can provide a different perspective by being twice the age of the average rmNUG member, yet feels he can learn quite a bit from the users at the meetings.

Rocky Mountain NeXT Users' Group Logos

Thanks to Stone Design for the complimentary copy of TextArt, I was able to create a series of logos for rmNUG. During our August meeting we will decide on which one to adopt as the rmNUG logo. If you are feeling real artistic and don't care for any of these, please feel free to create your own logo and submit it to me.

1

Rocky Mountain
NeXT
Users' Group

2

Mountain
Rocky
NeXT
Users' Group

3

Rocky Mountain
NeXT
Users' Group

4

Rocky Mountain
NeXT
Users' Group

Sound and Music on the NeXT Workstation

Public Domain Software

The majority of work in sound and music on the NeXT is currently being done by universities and individuals. The software produced is then often made public domain and freely distributable and often comes with source code. Much of the available software is described below.

CSound – CSound is an application for creating music on the NeXT. Please see the CSound Preface at the end of this paper.

edsnd – Edsnd allows you to examine and play sampled sound files and perform basic editing operations on the sounds. In examining the sounds you can view the sound's waveform and zoom in or out to give more or less detail. You can display an amplitude-frequency spectral plot of any portion of the sound with either linear or decibel scaling of the spectral plot. There is also an option to view the frequency means in the spectral plots. In playing the sound you can either listen to the sound in full or stop the sound at any point with the aid of a lap timer to identify events within the sound. The editing capabilities include cut, copy and paste on any portion of the sound or between two different sound files. You can also add a specified length of silence anywhere in the sound file.

FrontEnd – FrontEnd converts 11 and 22 kHz Macintosh sound files to a NeXT sound file format.

Hetro – Hetro is a heterodyne filter analysis program that works with CSound. Hetro takes a sound file and decomposes that sound into a graph of harmonically related sine waves with time varying amplitude and phase.

Looching – Looching is an application that uses the NeXT's digital signal processor to play computer-created music. The source code with this is a good introductory reference for programming with the Music Kit.

Quizzear – Quizzear does ear training on the NeXT. It tests aural knowledge of intervals by playing an interval and requesting a guess from user. Options for playing the intervals include different instruments, interval type (harmonic, melodic up/down, and composite intervals), scale type (equal tempered, just-intoned, and Pythagorean), and stereo positioning of the tones. Quizzear also provides vocal testing by playing a tonic note and asking the user to sing an interval above this tone. The singer's accuracy is displayed with a level

meter.

RecordApp – RecordApp records digital signals (sounds) from the NeXT's built-in digital signal processor (DSP). Although it is a simple program with little functionality, it provides a good source code example of interacting with the DSP.

Reverb – Reverb is an (almost) real time digital reverberation unit on the NeXT. Its functionality is low, but it is a good piece of example code.

Ringo – Ringo is a drum machine program that synthesizes up to six simultaneous drummers each playing one of eleven instruments in any time signature. Ringo also includes a swing mode to accent the off-beats.

SoundCompress – SoundCompress removes space between words in a piece of recorded speech to reduce the sound's playing time and disk space usage.

A number of other programs have been developed at Stanford, including Perry Cook's SPASM, an interactive vocal synthesis application, and ResonatorLab, a real-time digital filter tool, both of which can be used by non-programmers. Glen Diener at Stanford is developing a music notation program. Bill Parod at Northwestern has created an application for exploring tuning systems.

NeXT Bundled Hardware

Every NeXT computer comes with the capability to record and play CD-quality and 8 kHz CODEC-quality sound. The CODEC input is on the back of the MegaPixel Display and uses any microphone with a 1/8" plug. CD-quality, 44.1 kHz, stereo sound requires an input device to go through the NeXT's digital signal processor (DSP). Manufacturers of DSP input devices are listed under Third Party Hardware below.

Every NeXT comes ready to send and receive MIDI signals through either of its two serial ports with a MIDI interface cable (not bundled). Any standard Apple MIDI interface will work with the NeXT Computer.

NeXT Bundled Software

NextDeveloper/Demos/ScorePlayer – A player of scorefiles. This demo shows off real-

time DSP capabilities of the NeXT. ScorePlayer reads in a Score File and synthesizes music in real time using the built-in Motorola DSP. A Score File is an ASCII file containing all the information required to specify notes, waveforms, and related parameters. Scorefiles can be created from a text editor or generated automatically by a Score or ScorefileWriter object. A scorefile is interpreted when it's read by a Score object or performed by a ScorefilePerformer object, both provided in the Music Kit.

NextDeveloper/Demos/SoundPlayer – A simple but useful example of the playing of standard NeXT soundfiles (.snd extension). This application also lets you record CODEC microphone files. An excellent example of a very small application that's nevertheless quite useful.

NextDeveloper/Examples/SoundEditor – A sound display/edit/playback program built around the SoundView class. To use it you have to compile it yourself, but this only takes a few minutes. SoundEditor can open multiple documents and will accept workspace file open requests for ™.snd files. The program also demonstrates how you can put a SoundView within a ScrollView.

NextDeveloper/Examples/* –** Here are a few of the numerous other coding examples of how to use the music and sound kits in the directory NextDeveloper/Examples:

PlayNote	– press a button to play and adjust notes on DSP
PerformerExample	– adjust algorithmically-generated music playing on DSP
MidiLoop	– take MIDI input and send it right out the MIDI port again
MidiEcho	– take MIDI input, generate echos, and send it to MIDI output
MidiRecord	– read MIDI input into a Score object, then write a scorefile
MidiPlay	– take MIDI input and play it through the DSP
playscorefilemidi	– play scorefile through Midi output
exampsynthpatch	– demonstrates how to build your own SynthPatch and play it
mixsounds	– soundfile mixer that shows how to make your own Instrument
mixscorefiles	– mix any number of scorefiles and write the result out

Third Party Hardware

A/D64x™ (Singular Solutions) – The A/D64x™ Analog/Digital Interface provides hardware and software for high-quality sound recording and data capture on the NeXT Computer. When connected to the NeXT digital signal processor (DSP) port, the A/D64x extends the NeXT Computer's signal processing and sound reproduction capabilities to create a CD-quality digital recording system. Features include: two channels of 16-bit delta-sigma conversion with low linearity error, 64-times oversampling, a three-stage linear phase digital anti-alias filter, and error-cancelling self-calibration. Signals can be acquired at 32, 44.1, and 48 kHz sampling rates from multiple analog sources. The interface accepts direct digital (AES/EBU) data from compact disc players and digital audio tape recorders. An AES/EBU output port for digital audio recorders or mixers allows simultaneous analog/digital input and digital output as well as sample rate conversion.

Ariel QuintProcessor™ (Ariel Corporation) – Ariel QuintProcessor™ for the NeXT Computer features five 27 MHz DSP56001 digital signal processors that enhance the speed and versatility of the NeXT Music Kit and array processing library. With the added benefits of interprocessor communication, DRAM memory, and private mass storage, the QuintProcessor makes possible a sophisticated signal- and array-processing system previously unattainable on any commercial computer platform.

The QuintProcessor is ideal for array processing, music synthesis, speech recognition, and digital audio recording and mixing. It uses four of the processors to perform computation while the fifth manages DRAM memory, SCSI mass storage, and interprocessor communication. Communication throughput is enhanced through hardware-supported interrupt-driven I/O between the outboard processors and the central (fifth) processor.

Digital Ears™ (Metaresearch, Inc.) – A combination hardware/software package that lets users enter, record, and manipulate CD-quality sound and high-resolution laboratory data on the NeXT Computer. With Digital Ears, it's easy to create, prepare, and manipulate high-quality sounds for a variety of uses, including computer-based training, education, presentations, digital audio recording, voice therapy and diagnosis, and speech and voice recognition.

The Digital Ears hardware is an external box which digitizes line-level audio signals with true compact disc fidelity—16-bit, 44.1 kHz stereo—and sends this information to the NeXT Computer's built-in digital signal processor (DSP) port. SoundWorks™ is an easy-to-use and powerful sound recording and processing software application based on a familiar tape player user interface, complete with buttons, VU meters, and windows for editing sounds. Together, Digital Ears and SoundWorks turn the NeXT Computer into a sophisticated digital audio workstation and allow users to take advantage of the system's CD-quality audio playback capabilities.

DataController™ is a software object that allows the creation of custom audio and data cap-

ture applications in areas such as speech recognition and acoustic research. For speech and voice applications, a specially modified Digital Ears which samples at 16 kHz is also available.

DM-N Ariel Digital Microphone™ (Ariel Corporation)– The DM-N Ariel Digital Microphone™ complements the NeXT Computer's signal processing and sound generation capabilities. It's compatible with all existing software which makes use of the NeXT DSP port, including DSPtape™, sndrecord, sndplay, and MonsterScope. Supplied with a removable wind screen, 2.5 meter cable, user's manual, and the DSPtape recording application, the Ariel Digital Microphone comes complete with everything you need to turn your NeXT Computer into a powerful digital audio workstation.

The sleek, compact case contains all the necessary components for converting sound waves into a digital data stream. Analog sound conversion occurs at the source, eliminating the inherent signal degradation in analog transmission. The DM-N uses two 16-bit analog-to-digital converters that deliver a dynamic range of greater than 90 decibels (CD-quality) with total harmonic distortion of less than 0.005%.

A pair of rear-panel miniphone input jacks accept external signals from CD players, FM receivers, other audio sources, and industrial control instruments. Each input jack can accept either single-ended or differential signals, and the DM-N's sample rate can be selected to match the bandwidth of the signal of interest from a maximum rate of 88.2 kHz down to 5.5 kHz.

Connecting an external source to either rear-panel jack disables the corresponding channel's microphone element. With a single external source connected, the remaining channel's microphone continues to operate. This unique feature allows prerecorded material and voice to be combined in real time, greatly facilitating the creation of multimedia presentations.

CSound Preface

"PREFACE The concept of realizing music by digital computer involves synthesizing audio signals with a series of discrete points or samples that are representative of continuous waveforms. There are several ways of doing this digitally, each affording a different manner of control. The method of direct synthesis generates waveforms by sampling a stored picture or function table representing a single cycle. The method of additive synthesis generates the many partials of a complex tone one at a time, each with its own loudness envelope. Subtractive synthesis takes a complex tone and then filters it as required. Nonlinear synthesis employs techniques such as frequency modulation and wave shaping to imbue simple signals with complex characteristics. Sampling synthesis involves digital storage of natural sound, which can be recalled over and over in structuring a piece. Comprehensive moment-by-moment specification of an electronic composition would be long and involved. As a practical measure, control is prescribed in two ways: 1) by the structure of instruments within an orchestra, and 2) by the details of events within a score. An orchestra is really a computer program that can produce sound, while a score is a body of data which a program can read and react to. Whether a characteristic such as a rise-time

is a fixed constant in an instrument, or a variable prescribed by each note in the score, depends on just how the user wishes to control it. The instruments in a Csound orchestra are user-defined in a simple high-level syntax that then invokes complex audio processing routines. A score passed to this orchestra is made up of numerically coded pitch and control information, in a form known as standard numeric score format. Although many users are content to work in this format, higher level score representation and processing languages are often convenient. Two are described in these pages. The Scot language uses simple alphanumeric encoding of pitch and time data, in a fashion that parallels traditional music notation; its translator will produce a standard numeric score from this. The Cscore program can expand an existing numeric score (or create one from scratch), according to user-supplied processing algorithms written in the C language. One strategy, then, is to define a kernel score in Scot, translate it to numeric form, then expand and modify the data using Cscore before sending it on to a Csound orchestra for performance. This provides a powerful way of exploring score structures. The programs and languages making up the Csound system have had a long history of development, beginning with the Music 4 program written at Bell Telephone Laboratories in the early 1960's by Max Mathews. That initiated the stored table concept and much of the terminology that has since enabled computer music researchers to communicate. Valuable additions were made at Princeton by the late Godfrey Winham in Music 4B, and my own Music 360 (1968) was very indebted to his work. With Music 11 (1973) I took a different tack. The division into two clear networks of control and audio signal processing stemmed from my intensive involvement in the two preceding years in hardware synthesizer concepts and design, and this division has been retained in Csound. During its twelve years of heavy use in MIT courses and summer workshops, Music 11 was also enriched by much support software in sound analysis and score manipulation; the Scot software included here was developed by various MIT students under the guidance of Steven Haflich. Because it is written entirely in C, Csound is easily installed on any machine running Unix. At MIT it runs on Vaxes, MicroVaxes and SUNs under Unix 4.3 BSD, and on Hewlett Packard Bobcat workstations under HP-Unix (essentially System 5). With this common audio language and good networking, users move easily from machine to machine. In conjunction with other software devoted to real-time performance and hardware synthesis control, both interactive experiment and Csound high-resolution audio signal processing are brought into a single integrated environment."

Conclusion...

This paper started out as a short note I was writing to someone interested in music on the NeXT, but it grew a bit. I hope to continue to update rmNUG and the rest of the NeXT community with information on new and useful music tools as they become available. I would like to thank Conrad Geiger, Rob Poor and Doug Keislar for their help in writing this article.

Please feel free to contact me with any questions you have about this article. (See p. 15 for email and phone number)

– Brad Green, campus consultant, University of Colorado at Boulder

Internet Site Information

The following information is from j.cc.purdue.edu:~ftp/pub/next/ARCHIVES. We will continually provide the latest information on which sites are currently active and what you can expect to find. Please note the suggested time frames for each site.

NOTICE: J.cc.purdue.edu is no longer the authoritative Purdue archive # These archives are being moved to sonata.cc.purdue.edu # (128.210.15.30) and nova.cc.purdue.edu (128.210.7.22) # Send questions to archive-management@cc.purdue.edu and # submissions to next-archive@cc.purdue.edu # # gerrit, 7/31/90

Purdue Archives (Midwest) FTP = nova.cc.purdue.edu 128.210.7.22 pub/next 1800-0700EST FTP = sonata.cc.purdue.edu 128.210.15.30 pub/next 1800-0700EST

Oregon State Archive (West) FTP = cs.orst.edu 128.193.32.1 pub/next 1800-0700PST

Maryland Archive (East) FTP = umd5.umd.edu 128.8.10.5 NeXT 1900-0800EST

Purdue Email Archive (Midwest) EMAIL = archive-server@cc.purdue.edu (subject of help for info) 1800-0700EST

Other archives

See also the file pub/anon-ftp on cc.purdue.edu for a much larger set # of general interest archives. This list tries to sum up a few of those # archives which are of particular interest to NeXT users. If you would # like your archive site listed here send email to next-archive@cc.purdue.edu.

Sound stuff FTP = winnie.princeton.edu 128.112.128.180 pub 1800-0700EST

Mac related stuff FTP = sumex.stanford.edu 36.44.0.6 pub 1800-0700PST

GNU stuff FTP = prep.ai.mit.edu 18.71.0.38 pub/gnu 1800-0700EST FTP = plethora.media.mit.edu 18.85.1.50 1800-0700EST

XNeXT, athena stuff FTP = athena-dist.mit.edu 18.71.0.38 1800-0700EST

PostScript stuff FTP = nic.stolaf.edu 130.71.128.8 pub/ps 1800-0700EST

Tiff stuff FTP = ucbvax.berkeley.edu 128.32.133.1 pub/tiff 1800-0700EST

T - an object oriented dialect of Scheme FTP = wheaties.ai.mit.edu 128.52.32.13 pub 1800-0700EST

KJV Bible FTP = cs.ubc.ca 137.82.8.5 tmp/Next/LocalLibrary/Liturature /Bible 1800-0700EST

Random stuff FTP = sutro.sfsu.edu 130.212.15.230 pub 1800-0700PST

FTP = eesun1.arl.utexas.edu 129.107.2.51 public/NeXT 1800-0700???

FTP = sachiko.acc.stolaf.edu 130.71.128.17??? 1800-0700EST

The following shell script is an alternative to having to manually ftp by hand. It basically supplies the correct information to the standard input for the ftp program. You can execute the script (with /bin/sh) during off hours with the at(1) or cron(1) commands. Make sure you edit each line as is necessary. This example ftps the binary file NeXTBibleReview.wn located in the ~ftp/pub/next/buzzings directory of the cs.orst.edu site.

>>>>>----------<<<<<CUT HERE>>>>>----------<<<<<

ITE=cs.orst.edu

```
ftp -n $SITE <<PTF
user anonymous davehieb@boulder.colorado.edu
cd pub/next/buzzings
binary
get NeXTBibleReview.wn
bye
PTF
```

>>>>>----------<<<<<CUT HERE>>>>>----------<<<<<

You also might want to know about the comprehensive list of anonymous ftp sites that is published by Jon Granrose. This listing is available via anonymous ftp from pilot.njin.net (128.6.7.38) and is also included in each issue of NeXTAnswers. In case you miss it, here is the reminder that Jon includes:

REMINDER: Anonymous FTP is a privilege, not a right. The site administrators for the sites listed below have made their systems available out of the good- ness of their hearts. Please respect their wishes and restrict your FTPing to non-prime hours (1900 - 0600 hours local time for the site). This is especially true for sites not in your country. Please keep that in mind when you are FTPing. None of us want to see sites start to close down because a few are being inconsiderate.

rmNUG Mailing List

We will be including the rmNUG mailing list in each issue of the newsletter until the point where it turns into a several page spread. I feel that by including this type of information, you will be able to make even a broader base of friendships and acquaintances by being able to associate a name (and an address/number) with a face. This will also provide a convenient method of making sure that your information is checked (and corrected if necessary) on a monthly basis. If you feel that you don't want to have your information published, please feel free to contact me.

Name	Company	Phone (voice)	email address
Jim Alexander	USWest	(303) 889-6426	jima@uswest.com
Richard Beach	CSM		rbeach@mines.colorado.edu
Dan Beyers	Motorola	(303) 337-3434	
Steven Boker	Data Transforms	(303) 832-1501	datran2!smb@uunet.UU.NET
Ed Boring	CSU	(303) 491-7653	boring@euclid.math.Colostate.EDU
Dave Bowdish	Designer Documents	(303) 922-4893	73340.2146@compuserve.com
Mike Bush	USAF Academy		
Steve Coffin	US West		scoffin@uswest.com
David Cook	Cook Commun.	(303) 691-COOK	nyx!dcook%isis.uucp@nike.cair.du.edu
Glen Davis	UCAR	(303) 497-8643	davis@unidata.ucar.EDU
Don Dazlich	CSU	(303) 491-8585	dazlich@erehwon.atmos.Colostate.EDU
S. DeAlwis	CU	(303) 492-0511	dealwis@Colophys.BITNET
Barbara Dyker	CU	(303) 530-5275	Barb_Dyker@Amaze.UUCP
Kimberly Evans	CU		
Rich Fozzard	NOAA		fozzard@alumni.Colorado.EDU
Conrad Geiger	NeXT	(206) 454-6398	Conrad_Geiger@NeXT.COM
Aaron Gordon	CSM	(303) 273-3868	agordon@csm9a.mines.Colorado.EDU
Jacob Gore	Gore		jacob@blackbox.Gore.COM
Brad Green	CU/NEXT	(303) 786-9371	Brad_Green@NeXT.COM
Frank Hadsell	CSM		fhadsell@csm9a.mines.Colorado.EDU
David Hale	CSM		dhale@csm9a.mines.Colorado.EDU
David Hieb	CU	(303) 492-4316	davehieb@boulder.Colorado.EDU
Al Humphrey			
Robert Gregory	US West	(303) 733-573	
Kass Johns		(303) 594-4100 (2477)	
Bob Johnson	Martin	(303) 790-3641	
Warren Jokinen		(719) 637-1479	73437.3500@compuserve.com
Chriss Koch	Ampex	(719) 570-3233	boulder!agcsun!soul!song!Chriss_Koch.COS_ENG
Kathleen Lamb	CSM	(303) 273-3436	klamb@csm9a.mines.Colorado.EDU
Adrianne Link	NCAR	(303) 447-1223	adrianne@ncar.ucar.EDU
Joe Lounge	UNC	(303) 351-2807	
David Menges	US West		boulder!uunet!uswat.uswest.com!dcm
Eric Mueller	CU		
Joan Nadue	US Geo. Survey	(303) 236-5504	
Abdullah Naim	US West	(303) 938-8685	naim@uswest.com
Bill Nelms	Ampex	(719) 570-3284	
Charles Noren	NCAR		boulder!ncar!dinl!noren
Douglas Pattie	CSU/NeXT	(303) 491-6477	dpattie@NeXT.COM
John Pierce	NeXT	(303) 694-6700	John_Pierce@NeXT.COM
Dave Randall	CSU	(303) 491-8474	randall@ncar.ucar.edu
Mark Richards	Bsland	(303) 671-0676	
Wayne Rogers	CU		rogers@spot.Colorado.EDU
Joel Rosenblum	DPI	(303) 733-8158/721-8926	
Ray Rosich	Hughes	(303) 341-3814	
Lisa Saltzman	US West	(303) 896-9533	
John Shive	Hughes	(303) 341-3207	
Karl Sierka	NCAR	(303) 497-1338	sierka@ncar.ucar.EDU
Doug Simons	Thoughtful Sftwr	(303) 221-4596	
John Steele	CSM	(303) 273-3278	jsteele@csm9a.mines.Colorado.EDU
Coy Toavs	CU		toavs@tramp.Colorado.EDU
Chase Turner	CU	(303) 442-4711	chase@boulder.Colorado.EDU
Bruce Wood	CU	(303) 492-8172	wood_b@Colorado.BITNET
Dick Valent	NCAR		valent@ncar.ucar.EDU
Derek Wilson	CSM	(303) 273-3986	dwilson@csm9a.mines.Colorado.EDU