

IKONAS NEWSLETTER - vol.1, no.1

PRE-NCGA 1982 ISSUE--5/28/82

HELLO

Well, we've finally gotten around to putting a few things on paper. We hope the information in this newsletter will be of use to you and that you'll submit material by 1 July 1982 for the next issue in early July just before SIGGRAPH. This issue is mostly our copy. We'd like the next one to be yours.

NEWS

Adage, Inc., manufacturer of interactive refresh vector displays, has signed an agreement in principle to acquire Fulcrum Computer Group of Raleigh, NC. IKONAS is a wholly-owned subsidiary of Fulcrum. A copy of the press release is attached. We at IKONAS are certainly excited at the future the proposed acquisition will bring.

PRICE REDUCTION

IKONAS announced March 11, 1982 price reductions on the following items:

DR64 Image Memory:	Formerly \$ 7,000	NOW \$ 5,500
GPS - Graphics Processor Set: (BPS 32/M + MCM4 + SR8)	Formerly \$16,350	NOW \$15,000

NEW PRODUCT

IKONAS announced May 6, 1982 availability of the DR256, which is a version of the DR64 with 64K RAM chips. The DR256 can store 1024x1024x8 (LO RES MODE) or 2048x2048x2 (HI RES MODE). Display capability is roughly still the same as the DR64 - 512x512x8 (LO RES DISPLAY) or 1024x1024x2 (HI RES DISPLAY). The DR256 is most useful in double-buffering and image processing applications. Price is \$9,000.

NCGA

We'll be at NCGA in Anaheim June 14-17. Come visit. We'll have a good set of demo programs plus people to answer your questions. We'll be at booth #141.

NCGA - Hospitality Suite

Adage is graciously opening its hospitality suite to IKONAS users. The suite, in the Marriott Hotel, will be open Monday, Tuesday, and Wednesday evenings after 7:00 pm. We are emphasizing Monday evening as IKONAS User's night - but you are welcome and will see familiar faces on all three days.

SIGGRAPH

We'll also be at SIGGRAPH in Boston July 26-30 with all the bells and whistles we can muster. We hope to have several new products announced at that time. Booth Number is #2217.

**IKONAS**

### UNIX NET

We've got a PDP-11/60 up and running XENIX and attached to the USENET. Mail address is duke!mcnclikonas!info. Mike Mitchell is the UNIX guru here. Info is our common correspondence mailbox id. Mike will see that messages get distributed. We don't all check our mail daily.

### NEW SOFTWARE PEOPLE

At the beginning of the year we added several people to the software development group. VICKI WOOLF and ELIOT FEIBUSH joined us from Don Greenberg's Graphics Lab at Cornell. VAL BLETTNER and MIKE MITCHELL come from N.C. State University and are now full time employees after their recent graduations. MARTY McCLEAN is an experienced tech writer and has been revising old documents and working on new ones. GARRETT DUNN started last year as a test technician and has moved into writing microcode for the MA1024/D Matrix Multiplier and 68000 code for the MPC Multi-Peripheral Controller.

### ENGINEERING CHANGE

A bug crept into the PROM used to control timing of RS-170 sync signals. It won't affect displays on a monitor but may cause problems with NTSC encoders. If you need a corrected one - named "RS170A2" - check the box on the back page. The old PROM is labelled "RS170A" on the FBC board.

### NEW AND REVISED LITERATURE

We've put together a few new application notes and so forth. If you'd like a copy, check the box on the back page. If you need updated manuals check the appropriate box - sorry only one free copy per installation. Additional copies are \$25.00 each.

### USERS GROUP

We'll have a meeting at SIGGRAPH in Boston. We'll let you know time and date in the next newsletter. Please let us know if you'd like to make a presentation or have suggestions. Check the box if you plan to attend. Mary Whitton and Nick England are the appropriate contacts.

### REPORT FROM UNIVERISITY OF WATERLOO

NOTE: This report was received early this year before Waterloo took delivery of their RDS-3000 System.

The Computer Graphics Laboratory at the University of Waterloo is currently undertaking a number of projects which utilize an IKONAS 2000 frame buffer system. Most of these are written in C running under Unix on a PDP 11/45. We hope to move to a Vax 11/780 with the Berkeley Unix system in the near future. We can be reached on UUCP as "watmath!-jcbeatty" through either "decvax" or "teklabs", who call us regularly.

Baldev Singh is developing an editor for Benesh notation, one of the languages used by choreologists to score dance. Baldev is working with Rhonda Ryman of the Dance Group at Waterloo and Ms. Robyn Huges of the National Ballet of Canada. When complete the system will allow interactive creation and editing, much like a traditional full-screen text editor, but using the highly stylized Benesh symbols. The prototype system is menu-driven using a Summagraphics Bit-Pad for all

interaction. Color is used to highlight the portions of the score under consideration.

An interactive layout system for theatrical lighting and set design is being implemented by Sylvia Lea. Mark Kelman of the Drama Department at Queen's University is consulting on this project. When complete the system will enable a set designer to preview the stage under various lighting conditions and from arbitrary positions within the theatre. We hope to add a data base of the major Canadian theatres to assist designers in layouts for touring productions.

A major effort which is just beginning is our work on 2-D and 3-D modelling. An Evans and Sutherland calligraphic display will be used to manipulate B-spline and Beta-spline curves and surfaces. The IKONAS system will be used for full shaded renditions of the surfaces. This work is being done jointly with Brian Barsky at The University of California at Berkeley, the inventor of Beta-splines. Leo Boutette has already implemented a version of the software and the first ever shaded Beta-spline surfaces are being produced on the IKONAS 2000 at Waterloo. In related work, Paul Latimer has implemented a version of Alain Fournier's stochastic modelling techniques to produce textured surfaces. The next step is to merge the two ideas to produce textured Beta-spline surfaces.

These projects will eventually use firmware under development by Paul Breslin for the BPS32 micro. Paul has written a simulator for the BPS32 which greatly simplifies the debugging task. This, and the Small C Compiler written by Preston Gurd, should provide a more friendly interface to the microprocessor than the low-level assembler language. Preston's current efforts are devoted to improving the code generator's to take advantage of parallelism in the BPS32.

#### REPORT FROM GRAPHICS INTERFACE '82--Toronto 17-21 May 1982

The University of Waterloo group did IKONAS proud with two papers presented at GRAPHICS INTERFACE '82. Susan Goetz presented a paper on Colour Perception which vividly demonstrated the importance of choice of display colour for effective human interface.

Steve MacKay presented work on Frame Buffer Animation. Steve has used the Cross-Bar Switch to push animation one step beyond colour cycling and movie-looping. Steve gets a special award for a concise one paragraph explanation of the Cross Bar Switch which he gave in response to a question from the floor.

Both papers are available from IKONAS as applications notes. We hope we can get repeat presentations for the USER'S GROUP MEETING at SIGGRAPH in Boston.

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CONGRATULATIONS to Kelly Booth and John Beatty for all they and their students have accomplished at the University of Waterloo in the past two years. The two previous items illustrate the volume and calibre of work being done under their direction at Waterloo. There is a feeling of cohesiveness, excitement, and purpose within the group that doesn't happen without good faculty support.

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CONTRIBUTIONS WANTED

In addition to getting newsletter submissions we'd love to have slides, photos, tapes, etc. of the images you're creating with your IKONAS. We'd like to use them in advertising and promotion (with full credit to you naturally), so please indicate your willingness to have us use the material. If we can't use it publicly we'd still like to see what you're doing for inspiration.

USERS LIST

If you'd like to have your name and address listed in the next issue, please, check the appropriate place on the back page. We won't send this list to anyone but IKONAS users. Please, include a USENET address if appropriate, host computer, and application area.

T-SHIRTS

B-Spline T-shirts are available to users. Order blank on back - dollars are U.S. You too can wear the graphics T-shirt worn by Pierre Bezier.

From: IKONAS  
531 Pylon Dr.  
Raleigh, NC 27606

To:

Handy-Dandy Order Form

LITERATURE REQUESTS

Tech Notes

- \_\_\_\_\_ Video Rate Processing 2/82
- \_\_\_\_\_ Video Signal Characteristics 4/82
- \_\_\_\_\_ Ultra High Resolution Display 4/82
- \_\_\_\_\_ RDS 2000/3000 Differences 2/82
- \_\_\_\_\_ Dual Frame Buffer Operation 2/82
- \_\_\_\_\_ Video Taping 3/82
- \_\_\_\_\_ Colour Principles (Waterloo) 5/82
- \_\_\_\_\_ Frame Buffer Animation (Waterloo) 5/82

Product Spec Sheets

- \_\_\_\_\_ Price List 5/82
- \_\_\_\_\_ All modules 5/82
- \_\_\_\_\_ Outstanding Features Summary 4/82

Manuals

- \_\_\_\_\_ Programming Manual Rev. 5/82
- \_\_\_\_\_ IDL Manual Rev. 5/82
- \_\_\_\_\_ User Manual Rev. 5/82
- \_\_\_\_\_ Installation Manual
- \_\_\_\_\_ 68000 Monitor Manual

ENGINEERING CHANGE

\_\_\_\_\_ Please send new RS170A2 PROM

USERS GROUP

\_\_\_\_\_ People will attend

USERS LIST

- \_\_\_\_\_ Yes, add my name
- \_\_\_\_\_ No, do not release my name
- \_\_\_\_\_ Name \_\_\_\_\_
- \_\_\_\_\_ Address \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

USENET Address \_\_\_\_\_

Host Computer \_\_\_\_\_

Operating System \_\_\_\_\_

Application \_\_\_\_\_

The Classic IKONAS T-Shirt:

Old B-Spline: A Smooth Blend of Premium Tensor Products  
 100% Cotton - first quality Hanes T-shirts  
 Men's sizes - \$7.00 includes postage & handling  
 \_\_\_\_\_ small \_\_\_\_\_ medium \_\_\_\_\_ large \_\_\_\_\_ x-large  
 A limited number of child sized shirts are available.

Pre-addressed - Fold & Stamp

HELLO AGAIN - Well, as we threatened in the last issue, here we are again to brighten your day. We haven't received any overwhelming number of articles from you IKONAS users so this issue won't be too long. We have received a good number of literature requests though, and hope we can continue to be of service to you.

NCGA REVIEW - We packed up our dog and pony show and headed for Anaheim for the National Computer Graphics Association Conference in June. The show was attended by about 20,000 interested parties and we showed off for a fair percentage of them. We took a PDP-11/34 with two IKONAS RDS-3000 Systems. One system we used mostly for an imaging demo by cycling through four 512x512 full color images. The other was used for an interactive demo of vector drawing and solid surface display.

Many thanks to you folks who came by and said hello or asked questions. We'll be seeing you again at SIGGRAPH in Boston.

A whole group of IKONAS people worked very hard to put the demo together and we'd particularly like to recognize the following:

VICKI WOOLF - System software plus IDL code for demo operation.

ELIOT FEIBUSH - Microcoded hidden surface, shading and polygon drawing.

HENRY RICH - Supervised the effort plus microcoded anti-aliased vectors.

GARRET DUNN - 68000 Code for the MPC plus microcode for the MA1024 perspective division.

VAL BLETTNER - IDL programs for titling and interactive devices.

Also, PETE EVANS, MIKE KING, ROBERT WHITTON, NICK ENGLAND, and MARY WHITTON

IKONAS FOLKLORE TRIVIA QUESTION OF THE ISSUE:

WHY IS THE BIT-SLICE PROCESSOR CALLED THE BUMP?

SIGGRAPH PREVIEW - We'll have the same systems at SIGGRAPH and will be running interactive graphics and imaging demos. Please come by and take a look at the new functions being added to IDL: anti-aliased line drawing and solid object display. We'll be at Booth 2217 in Boston July 27-29.

USERS MEETING - We've got a Users Meeting scheduled for SIGGRAPH on Thursday, July 29 from 8:00 AM to 12:00 Noon. It'll be held at the Colonnade Hotel. Please let us know ASAP if you have suggestions. Please attend if at all possible - it'll be worth your while.

TOPICS TO BE DISCUSSED INCLUDE: IDL as used at RCA, IDL extensions (both available and planned), the FORTRAN support package, future products - both near and far future, and demo of the color and animation work from Waterloo. Oops, that's colour up there. We'll have juice, buns and coffee to help you forget the ungodly hour and will try to be done before the 10:30 session begins.

ADAGE DEAL - Included is a press release covering the signing of the definitive agreement of Adage's acquisition of IKONAS. We're all looking forward to a good future with Adage and hope you'll take the opportunity to meet some of the Adage people at SIGGRAPH. With Adage we'll expand sales and support of the IKONAS RDS-3000 product line. Manufacturing and Field Service will move to Adage's facility in Billerica, Mass while engineering and development will stay in Raleigh, NC.

If you'd like more info on Adage, please write Claire Moulton at the address given on the press release. Also feel free to come by the Adage Hospitality Suite during SIGGRAPH. Come by the IKONAS booth for location information.

NEW STUFF - We're coming along on UNIX for the 68000 based MPC card as well as a Winchester disk system add-on. Unfortunately we won't have them ready for SIGGRAPH. We do hope to have a device (code-named APEX) which will put up characters and filled areas at 32 million pixels/second. If you've got a suggestion for a real name, let us know.

INVITATION - Please send along any notes (or whatever) you'd like us to include in the next newsletter. Let other people know what you're doing and maybe you'll get some help. Need a piece of software? Maybe someone has already written it and is willing to trade or share. This issue contains info from the pioneers in Dallas who bought IKONAS RDS-2000 serial number 1. They've now got RDS-3000 #40 or so. Give them a call if you're interested.

NUMBERS - Speaking of serial numbers, RDS-3000 #100 is currently going through the production line. It's a long way from the first RDS-1000 we built in the back room of Nick England and Mary Whitton's house. By the way, that first frame buffer is still in operation at N.C. State University. They have bought a 3000 now, but will keep the old system running.

BIRTHDAY - IKONAS celebrated its fourth birthday on July 13, 1982. Mucho thanks to all of you who made it possible.

INSTALLATION - Integration of equipment and software from different vendors is generally a trying experience at best. We will now install IKONAS systems for customers for 1% of purchase price (\$400 minimum) plus

expenses. Two recent customers have had a very difficult time doing their own installation and have been very vocal about "sorry IKONAS equipment". It turns out both systems worked fine but one group had mis-compiled software and the other had changed their interface to an invalid interrupt vector. We do make mistakes, and our documentation needs expansion, but by having us do an installation maybe we can all be happier faster.

NEW AD - IKONAS has a new full page, full color ad running in the July issues of Computer Graphics and Applications, Computer Graphics World and Computer Design. Thanks to Pete Atherton (GE), Vicki Woolf (IKONAS) using data from Phillips Petroleum Company, Bob Evans and Otis Brown (U. Miami), and T. Williams and Gary Bishop (UNC-CH) for the images that appear in the ad. We are always looking fFor material for ads--so some of you new users send us some images and we'll see if we can use them.

People giving seminars on Computer Graphics often call IKONAS asking for images they can use to show state-of-the-art work and the variety of applications for graphics. If you're proud of your work--let IKONAS help you show it off by getting it to the seminar folks. Contact person is Mary Whitton. (See the enclosed description of tape format for exchanging images in digital form.)

SOLICITATION - Please write and let us know your opinion on various things we can do (or don't do), new products you'd like to see, or any questions about how to use your IKONAS box. Also please send in a paragraph or two on what activities you're involved in.

NTSC ENCODING - We understand several customers have had good results with the FERNSEH TCE-2000 encoder. Please give us your comments on this or other units. Send to Nick England. We'd also like to know if anyone is using an NTSC decoder and what your opinion is.

MONITORS - We're also soliciting opinions about monitors. We ship Mitsubishi units because we're pretty happy with their quality and value. Do you have an alternate you think is better? What has your experience been? Again Nick England is the person to contact. We'll have Mitsubishi, Barco and Tektronix monitors running in our booth at SIGGRAPH. Come by and look.

#### UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER--USER REPORT

The IKONAS installation is doing well at the Neuroscience Computer Laboratory at the University of Texas Health Science Center at Dallas. After living through the first bumpy months of serial #1 of the RDS-2000 series, we have upgraded to an RDS-3000 and have evolved an efficient and matured system for getting microcode up and running.

Our overall goals are to acquire neuroanatomical data from a variety of sources including photographs, slides, video and light or electron microscopes. Information from serial planes through anatomical structures is aligned and manipulated. Solid body images are generated of surfaces of brain regions and of distributions of objects in space. Video image recognition procedures are beginning to aid in acquiring data from the light microscope. The IKONAS system is proving quite versatile at our range of tasks.

EDITOR'S NOTE: There's a good chance (but no guarantee) you'll be able to see some of the work Texas has done at SIGGRAPH.

TEXAS CONTINUED--MICROCODE DEVELOPMENT TOOLS AVAILABLE

We have heard from a number of possible future users of the IKONAS system. The most universal concern seems to be the amount of resources which may be required to produce microcode. Our shop, at least, has produced a number of tools which make microcoding relatively straightforward as well as the training of new microprogrammers.

It might aid some installations to gain access to our developmental work. We will now be able to provide code, instruction and support for a number of items through a license and fee agreement. These include: 1) A detailed programmer's manual with flow charted examples to supplement the IKONAS documentation; 2) A host based interactive development system which includes a simulator-debugger cross assembler program in Fortran (to run on most installations). Such a system is a must for any shop interested in producing useful microcode within reasonable deadlines. All of our code is now produced and tested in the host before being run on the BMP (see TRIVIA question); 3) A polygon shaded fill routine with versatile Z-buffering to fit many memory configurations has now matured through several versions; 4) A single precision floating-point package is optional; Included functions are +, -, x, /, sine, cosine, arctan, and matrix multiplication. 5) A blob recognition routine has been developed which is based on a fill of regions above or below a threshold. 6) A sub-routine handler (a must) is available which controls resources and schedules routines. The extensive flow charting and documentation of these programs alone might be useful for instruction and for building blocks for other routines.

Those interested should write Donald Woodward or Wade Smith, Dept. of Cell Biology, University of Texas Health Science Center at Dallas, 5323 Harry Hines Blvd., Dallas, Texas 75235. (214 688-2234/2483).

ANSWER TO THE FOLKLORE TRIVIA QUESTION::

In the days of the RDS-2000 the bit-slice processor and its sequencer were two modules rather than the single BPS (Bipolar Processor Sequencer) in the RDS-3000 system. The sequencer was known as the MPS (Micro-Program Sequencer) and the processor was designated BMP (Bipolar Micro-Processor)--hence BUMP. History is clouded, but legend has it that the term was coined by Gary Bishop at UNC-CH.

PROGRAMMING TRAINING COURSE - The first IKONAS Programming Training Course is scheduled tentatively for late August. We will limit attendance to 10 for the week long session in Raleigh. Let Mary Whitton's new assistant, Phyllis Flynn, know if you're interested. A formal announcement will be mailed to you after SIGGRAPH.

MORE NEW STUFF - We've now got the CB24, a twenty-four slot backplane which is the same size as the old CB12. Give Mary Whitton a call if you're interested. We're working on the CB6, a short chassis for OEM applications. The VPM Video Processing Module is in PC layout. We expect the first SR32 and MCM16 boards during August. We'll issue press releases on these gadgets when we prices, etc. decided.

IKONAS TAPE IMAGE FORMAT - Images should be written on an unlabeled tape in 9 track, 800 bpi format. The first block of each file should contain ASCII text describing the image resolution in pixels (HxW), the number of bits per pixel, and the name and phone number of the author and his or her organization.

The image should be written to tape in scanline order from the top to the bottom of the display. 1 Record = 1 Scanline of 1 channel (R, G or B)

If the number of bits per pixel is greater than eight, the least significant eight bits of each pixel should be written to tape first (for the full scanline). Then the next most significant bits for the SAME scanline should be written, and so on, until all the bits of the pixels on this scanline have been written. This process should be repeated for each scanline until all scanlines of the image have been written.

Each image file on the tape should be terminated with a single tape mark (EOF). The completed tape should be terminated with two consecutive tape marks (EOT).

If you have any questions, contact:

Vicki Woolf  
Software Development  
Ikonas Graphics Systems, Inc.  
531 Pylon Drive  
Raleigh, NC 27603  
(919) 833-5401

SPEAKING OF THE EDITOR AND THE USERS GROUP ...

How about one of you hardy users taking on this newsletter...

How about a user to coordinate the users group--so that it can be your group and respond to your wishes....

How about an off-season meeting so that the users who are involved in SIGGRAPH as tutorial leaders, sessions leaders, and paper presenters and next year as conference chairmen can have some input when their minds aren't on other matters....

SEE YOU NEXT WEEK IN BOSTON!