

ARCHITECTURE MACHINATIONS

A weekly newsletter of the Architecture Machine Group, Department of Architecture, M.I.T., Room 9-518, Lee Nason, editor.

Vol. II., No. 35.

August 29, 1976

IN THIS ISSUE: THIS WEEK AND BEYOND.....	page 1
ABOUT <u>MACHINATIONS</u>	page 1
PLACE.....	page 2
HARDWARE NOTES.....	page 4
FIRST INTERNATIONAL CONFERENCE ON COMPUTER MUSIC.....	page 9
NEW ARPA CONTRACT.....	page 10
SPACED-OUT IN WASHINGTON, D.C.	page 10
TRIP TO FT. EUSTIS AND ARLINGTON.....	page 12

NEWS FLASH: JUST AS MACHINATIONS GOES TO PRESS, THE COLOR SCOPE IS
BEING REMOVED FROM 9-551 (SEE NICHOLAS' "PLACE").

THIS WEEK AND BEYOND

Monday at 10:00 A.M.

We will have a space meeting with
Bill Kelly. Subjects will range from
ideas for the Place (notes follow)
to implementation of closet emptying.

Tuesday

Nicholas will meet with NBC re the
Lipchitz project.

Thursday

We will have a visit from Boeing
starting in the afternoon and
continuing on Friday.

ABOUT MACHINATIONS

A few weeks ago we included an entry by Guy Weinzapfel entitled "Is
Machinations a Waste?" Remember this was triggered by a critical
position taken by a program director at NSF.

This week we met to discuss the future of Machinations and related
policy.

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August 29, 1976

ABOUT MACHINATIONS continued

In between, we have been receiving fan mail -- with one exception: an honest remark that the newsletter has the tone of "look ma, I'm dancing."

The result of all of this is that Machinations will stay quite the same. It is a newsletter, not a publication. It is rag, not a scholarly journal. 38 people currently receive Machinations via the United States mail. In all cases they are colleagues, sponsors, or industrial contributors. Machinations is a way of letting them peek in, confirm their interests (or disinterests), and help with problems when they arise.

The major change will be an attempt to raise the quality of writing and graphics. To this end we are changing our schedule. Machinations will come out on Fridays, not Mondays (no more Sunday night charrettes). Hardware and software notes must be in by Thursday at 5:00 P.M. Everything else should be in by Wednesday at 5:00 P.M. In cases where you plan to have illustrations, please get those in by Tuesday.

It is hard to underline the term newsletter, short of stopping all mailings. We use Machinations as an internal mechanism to inform one another what each of us is doing, to introduce some discipline about reporting on trips and the like, and to initiate some of the student-staff to documenting their ideas before they code them. No, it is in no sense a scholarly document. For this reason, no more NSF funds will be applied to cover any of its expenses.

Nicholas Negroponte

PLACE

This Tuesday the color scope (XDP) leaves and Slezak and Co. will gut room 9-551 (at which time, by the way, the black and white Xerox will move to 9-516A). Following, we will build a computing place. I hereby invite everybody to submit their fancies for such a space. Here are some of mine.

(Diagram of where the "Place" will be appears on the next page -- Ed.)

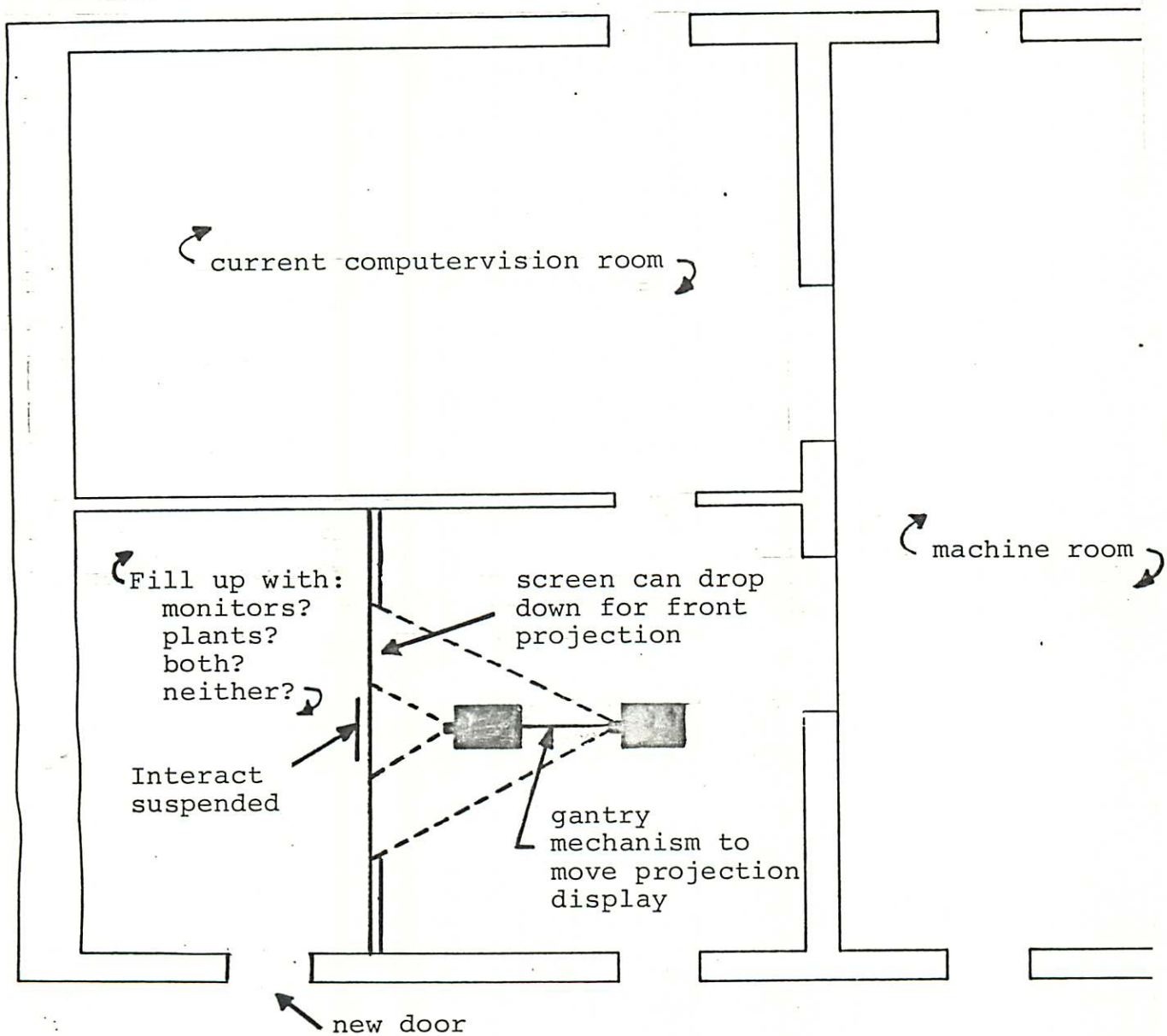
ARCHITECTURE MACHINATIONS

A weekly newsletter of the Architecture Machine Group, Department of Architecture, M.I.T., Room 9-518, Lee Nason, editor.

Vol. II., No. 35.

August 29, 1976

PLACE continued



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August 29, 1976

PLACE continued

Foremost, it will be totally quiet, isolated from the machine room, conceivably without even a door connecting directly to it (i.e., you will have to go out into the corridor and back into the machine room).

Full color graphics will be projected on at least a three foot by three foot surface (full color, obviously), but variable in size, up to the full height of the wall.

The Interact should be mounted on this surface for complete force feedback interaction with the large display. The full regalia of tablets, globes, and the like will be available.

Finally, sound and voice will be four-track output with the intention of placing either anywhere in 3-space. Guy, are you willing to be the project manager for this one?

Nicholas Negroponte

HARDWARE NOTES

7/32 PROBLEMS: There is a known bug in older 7/32's that causes the machine to hang irretrievably in certain situations -- notably during autoloading or during intensive system hacking. Interdata is aware of this problem and has corrected it on later machines. We have two machines which have the bug ("a" and "b") and one that does not ("c").

There is only one accepted way to fix the machine when it hangs up: the memory must be pulled and strapped to a new address, and a new first memory module must be inserted. This is a complicated hardware procedure, and should not be attempted by anyone not trained to do it!

There is a rumor going around that this bug can be fixed by inserting a memory module with the power on. Needless to say, this is an extremely risky procedure and should never be done. Memory modules are the single most expensive boards in an Interdata, and they are easily damaged by this procedure. Note the large number of memory failures that we have had on 7/32's lately.

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HARDWARE NOTES continued

We are negotiating with Interdata to have our CPU's updated to eliminate the problem. Interdata is sympathetic and agrees that rewiring modules is not an acceptable solution. In the meantime, DO NOT PULL THIS "POWER ON" FIX! If you must do work that ends up bombing the machine, come in during the day when there is someone around who can help you. If the machine bombs at night and can't be fixed, power it off and leave a note.

IMLAC NEWS: After an infinite number of hang-ups at Imlac, the fourth machine is finally almost ready to be returned to us in working order. They avoided picking up the machine at the beginning of the summer because they couldn't find a truck. Then they did pick it up one week before their annual summer plant shutdown, and finally delayed fixing the machine long enough so that the end result is that a repair initially claimed to take one to two weeks has lagged on for two and a half months. We expect the machine back on Tuesday.

Bob Hoffman will then install the display mods, and the Interdata interface, and if we are lucky, it will be ready in time for class.

MACHINE CONFIGURATION: We are moving towards a configuration that was agreed upon two weeks ago that will get us through the first term and until Magic 6 is up. For those of you not familiar with it, it is described below. 7/32's A and C and the 70 are affected.

7/32-C: This will be the file machine, and will run Magic 4.3B. This machine will not be on the shared bus, and will have its own dedicated reader and ARDS(B).

7/32-A and mod 70: These machines will be the remotes, and will be on the shared bus. Normally class will be run on these machines with Imlacs, enabling us to avoid teaching new students how to use more than one console device or system.

Except for system 6.0 debugging, Magic 4.3B will reside in the file processor. When we want to use the machine, we will do so via either A or the 70. There will be a small sacrifice in speed over the completely stand-alone Magic's, but that will be balanced by the fact that two of you may use the same disk at once.

You may expect the system to conform to the above description next

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HARDWARE NOTES continued

week. In the meantime, we will leave 7/32-C on the bus, and run with the 70 and 7/32-A effectively down.

RAMTEK DISPLAY: By now all of you know that we are getting a second raster-scan display. It will be the RAMTEK 9300, and will arrive on or about October 6th. Naturally we will want to make some changes in

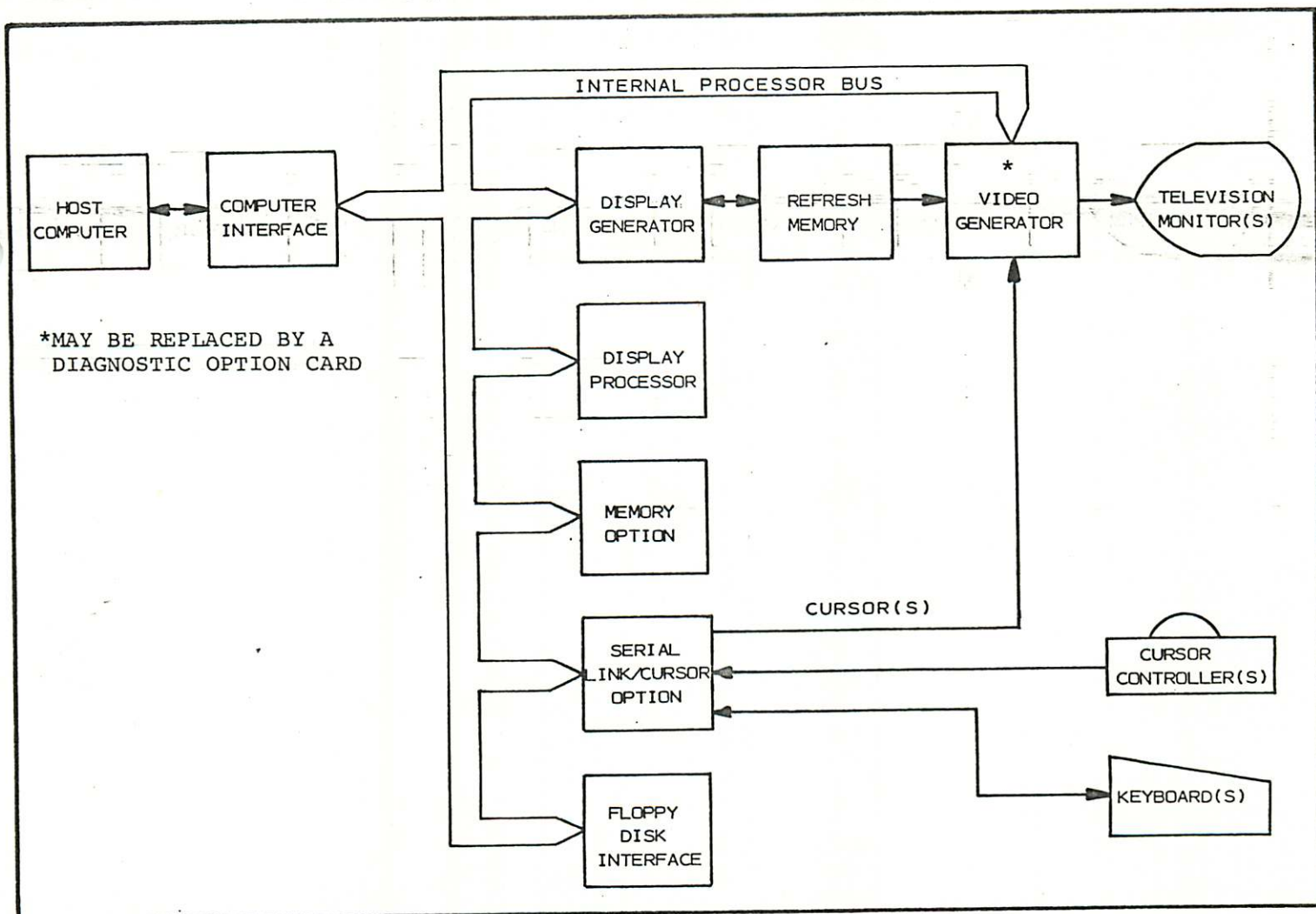


FIGURE 1-1 RM-9100, 9200 AND 9300 FUNCTIONAL BLOCK DIAGRAM

ARCHITECTURE MACHINATIONS

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HARDWARE NOTES continued

its operation: one of the first projects will be to interface a high quality video camera so that the machine will act as a frame-grabber. Other contemplated changes include direct access to the refresh buffer, and output matrix mods. If none of this makes any sense to you, or you want to comment on it, contact me. Periodically, I will be coming out with some notes about what will be happening. If you have some idle moments, you might consider to which Interdata we interface it. The diagrams on this page and the previous one characterize the system.

Andy Lippman

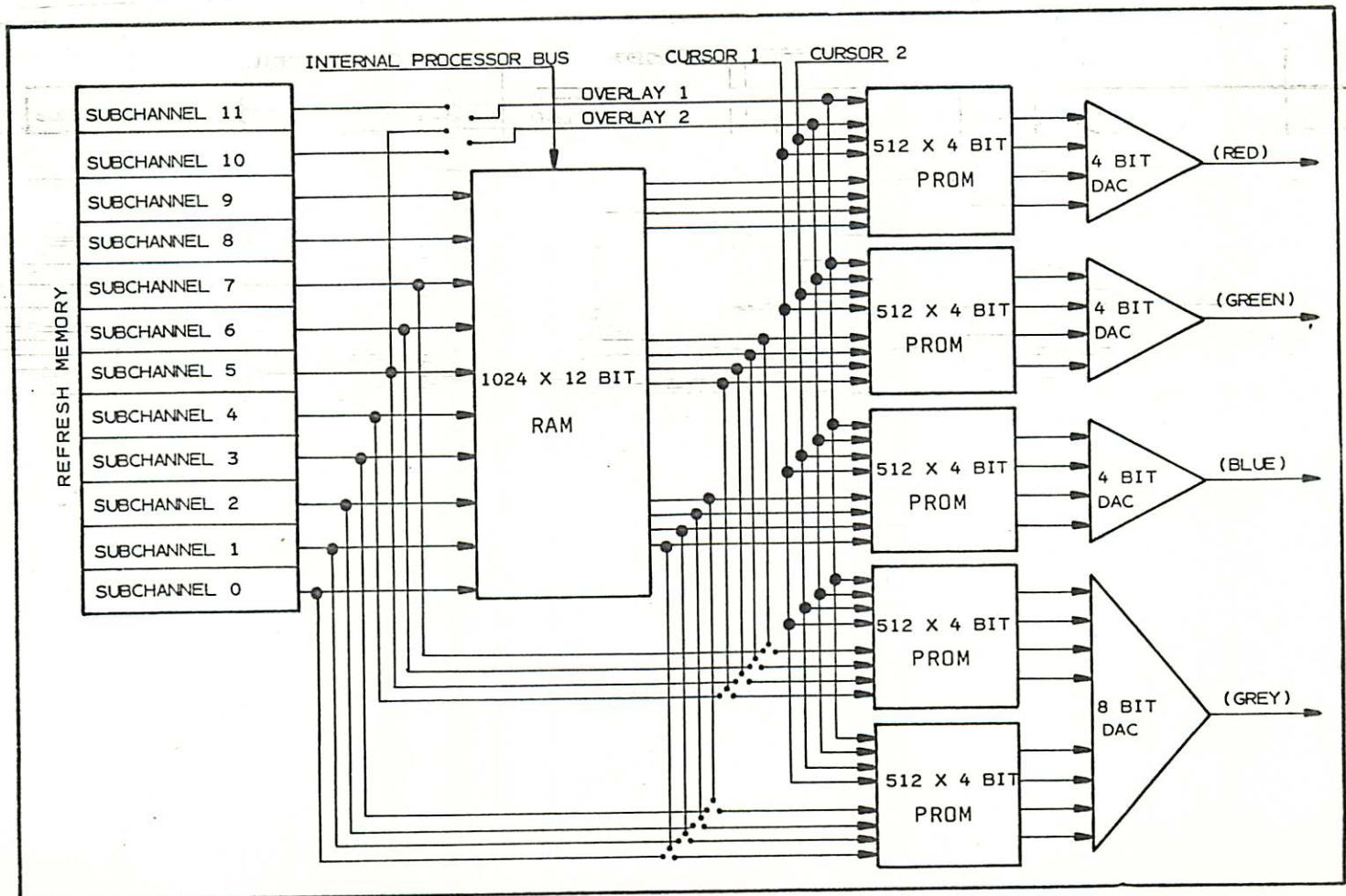


FIGURE 1-3 RM-V2 FUNCTIONAL BLOCK DIAGRAM

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First International Conference on Computer Music

October 28-31, 1976 at the
Massachusetts Institute of Technology

in conjunction with the 1976 ISCM World Music Days
Boston, Massachusetts USA

Papers Discussions Demonstrations Concerts

The third annual US Conference on Music Computation will again bring together leading composers, scientists and engineers involved in the application of digital technology to the creative musical arts. This year's conference at MIT will coincide with the 1976 festival of the International Society for Contemporary Music (October 24-30), held for the first time in the United States. Schedules have been interleaved, making it possible to attend both the Conference and World Music Days. Certain events are jointly sponsored.

Call for Papers

The Conference wishes to entertain papers and discussion in the following areas:

- Software Synthesis Techniques
- Hardware Synthesis Techniques
- Digital Control Systems
- Sound Analysis/Synthesis and Perception
- Input Representation Languages
- Compositional Procedures
- Protocols of Man-machine Interaction

Presentations will be limited to about fifteen minutes. Persons wishing to present a paper or report should submit an abstract not exceeding 200 words, in English, typewritten, and suitable for pre-conference publication.

Audio-visual aids available: 2 x 2 slide projector, overhead projector, 3/4" video cassette player, 1/2" video tape player, 1/4" 2- and 4-channel audio player (7 1/2-15 ips).

Deadlines

Abstracts must be received no later than Wednesday, September 15, 1976. Notification of acceptance will be mailed on Monday, September 20. Mail abstracts, together with a list of audio-visual requirements, to the Conference Chairman.

Concerts

The Conference will sponsor three public concerts of electronic music. One is an official ISCM concert and will include works by Barbaud (France), Wigen (Sweden), Radovanovic (Yugoslavia), Raxach (Netherlands), Laporte (Belgium) and Boretz (USA). Composers are invited to submit computer-produced works for consideration for the remaining concerts. Tapes should be 2- or 4-channel, on 1/4" or 1/2" tape, recorded at 7 1/2 or 15 ips. Include a brief program note describing the synthesis method and facilities used. Tapes must be in the hands of the Conference Chairman by Friday, October 1.

Registration and Housing

There will be a Conference Registration Fee of \$30, or \$20 if paid by October 1. Student rates are \$15 and \$10, respectively. Early registrants will be sent pre-prints of the conference program and abstracts. Conference participants will also gain free admission to certain ISCM functions. A joint ICCM-ISCM Banquet, however, is optional at \$15.

Housing arrangements are the responsibility of individual participants. Return your forms early.

A set of registration and housing forms is mailed with this notice. Additional copies may be obtained from:

Conference Chairman

Barry Vercoe
Computer Music Conference
Room 26-313
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139
USA

For additional ISCM information, write
ISCM
New England Conservatory
290 Huntington Avenue
Boston, Massachusetts 02115
USA

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NEW ARPA CONTRACT

On Tuesday, August 24th, Nicholas and I went to Washington, D.C. to meet with Dr. Craig Fields, Program Manager, Cybernetics Technology, for ARPA. Craig gave us final official word that our contract has been approved. The project will extend over two years commencing October 1, 1976, and the theme will be Spatial Information Storage and Retrieval System. Think of data -- text, figures, pictures, drawings -- stored in 2-D or 3-D space, with the User "navigating" through that space. We are immensely pleased to pass this news along and we look forward to a very exciting project.

A particular appeal of the project will be that it will capitalize upon some of the Architecture Machine's original background: architecture. Namely, the retrieving of data will be much like finding one's way back to a place. Additionally, this contract will support the construction of this frequently-promised magical room for the 85 where almost every surface will be for both graphical input and output (see Nicholas' "PLACE").

Dick Bolt

SPACED-OUT IN WASHINGTON, D.C.

While in Washington to meet with Dr. Craig Fields of ARPA (see above article), Nicholas and I went over to see the new National Air and Space Museum on Independence Avenue. It is part of the Smithsonian Institution, and is near the Hirshhorn Museum. We went there specifically upon the strong recommendation of Craig to see a movie entitled "To Fly". The movie is about twenty minutes long, and is shown at regular intervals throughout the day.

While only twenty minutes long, the movie more than makes up in sheer size what it lacks in length. It is shown on a screen which is five stories high, and involves a novel projection system called IMAX. Thus, with the picture on and the theater dark, the picture fills your entire field of view.

Well, it's one of those things that have to be seen to be appreciated;

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SPACED-OUT IN WASHINGTON, D.C. continued

so, put it high on your list when next you are in Washington. The film gives a brief history of flight -- starting with a balloon ascension and voyage that has you soaring over treetops and church steeples. The colors are beautiful. The scene literally fills the eyes, and one learns first-hand what the psychological effect called "visual dominance" really is when one tries vainly to steady the sway of the balloon by gripping the arms of the theater seat, though you know the theater is steady as a rock.

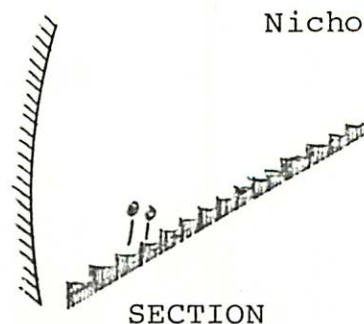
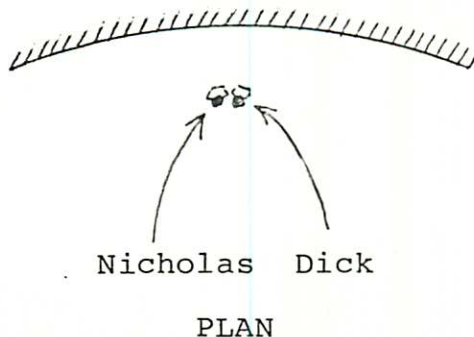
But the best (or the worst, depending upon the state of your stomach and vestibular system) is yet to come. The balloon proceeds to sway down over a rapidly rushing stream, with "white water" mounting up until you go over a waterfall -- with volumes of visual space bursting in upon your eyes as the visual plane of the stream bed suddenly gives way to the falls.

Later scenes give you a first-hand impression of what it must be like to be scotch-taped to the under-belly of a jetliner as it lolls over Manhattan, or plunges over the rim of the Grand Canyon.

All in all, it is an overwhelming visual experience, inducing the feeling of traversing great volumes of space. If you're in Washington, you really should try to see it. Don't forget your Mothersill's.

Dick Bolt

I am adding the following two diagrams to illustrate our position during the show. Dick failed to mention that we were the frontmost viewers at this particular showing. It forced me to revise some of my ideas about being surrounded by data.



Nicholas Negroponte

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TRIP TO FT. EUSTIS AND ARLINGTON

On Tuesday, August 17, I visited Ft. Eustis, Virginia near Newport News in the southeastern corner of Virginia to chat with Lt. Cols. Jim Lane and Henry Gibbons of the U.S. Army Training Support Center about how the Army regards the role of displays in training devices. The focus is upon simulation exercises. The utility of simulation, generally, is regarded as three-fold: 1) screening of personnel, 2) provision of realistic experience, and 3) evaluation of performance. The notion of an "add-on" simulator was brought up: a sort of "black box", add-on component to be integrated with regular equipment (for example, training people by simulation procedures linked-up to an actual airplane cockpit, rather than via a LINK-trainer type of "mock-up"). The real airplane becomes itself the trainer.

On the following day, August 18th, I made a visit to Science Applications, Inc. (SAI), and then to the Army Research Institute, both in Arlington.

At Science Applications, I was hosted by Dr. Charles Stringfellow, who initially gave me an orientation to activities at SAI. The company has shown extremely rapid growth since its founding only seven years ago: from about \$1 million in contract revenues to over \$45 million in 1976. With headquarters in La Jolla, California, it has over two dozen principal offices across the country.

The company's general role is in applying science and technology to problems in Defense, Health, Energy, and Resources. For example, they are deeply into environment and energy resources, management analysis, and advanced computer and display systems. Their expanding role in this last topic prompted my visit -- especially their interest in touch-sensitive displays.

Among other things, I was shown their touch-sensitive plasma panel display terminal. Their plasma panel is 8.5 inches square, with 512 by 512 addressable points. (Larger panels are forthcoming.) The panel can be back-projected upon quite easily; films or slides can be integrated with the plasma display. I was shown several cassette-stored programs, some of which were tied-in with appropriate back-projected slides.

The model plasma panel display which I was shown had a touch panel. A matrix of infrared light-emitting diodes and phototransistors on the frame of the plasma panel set up a 16 by 16 matrix of light beam

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TRIP TO FT. EUSTIS AND ARLINGTON

paths. The grid formed thus had a resolution of 1/2-inch, acceptable for fingers. When you broke any beam path on the panel with your fingertip, you got a low-volume "ping" as auditory feedback. The device, overall, seemed simple, durable, useful. The conjunction in the same plane of a) plasma display, b) back-projected display, and c) touch sensitive surface, makes for concentrated information exchange.

SAI has an Instronics tablet on the way, and will be getting into our kind of TSD shortly.

On the afternoon of the 18th, I visited Dr. Raymond Sidorsky at the Army Research Institute (ARI), on Wilson Boulevard in Arlington, Va. (about a ten minute walk from SAI, as it turned out). Dr. Sidorsky's office also has an Instronics tablet on the way, and is much interested in TSD-type applications.

ARI has a staff of psychologists, sociologists, statisticians, and computer specialists working on a wide variety of human resources problems, including a program in the study of human factors technology relating to information display. Sample topics in this area include differential display characteristics for CRT presentation of static and dynamic information, and effects of multiple coding dimensions of symbolic representation on information transmission. The thematic relevance to our own upcoming ARPA contract, as well as to our TSD project, is obvious.

The topics covered in these conversations over two days are too many to catalogue. However, two strong themes emerge: 1) the vital interest in concerted multiple-media; and 2) the interest in direct user interaction with data structures, as exemplified by TSD techniques.

Dick Bolt