

THE CRUNCHER -- A LOW-ORDER COMMUNITY MEMORY SYSTEM

The "Cruncher" project originated from an attempt to scale down previous Community Memory proposals to a level at which development could begin with resources on hand. As the idea developed it became apparent that the lowering of the scale of the system allowed an interactive process to occur in the development of the institutions of community communications which are a necessary part of any Community Memory. This lowering of the necessary intensivity of interaction, together with the physical broadening of the base of usership brought about by mobile operation of the equipment, implies that a pilot system may be constructed with equipment now on hand which is also a true prototype for future expansion.

We call it the "Cruncher" because the system will be designed initially for batch sorting and merging, or what could be called "text crunching". The primary reason for this design compromise is that large-scale rapid-access storage devices are not available at acceptable price levels for this pilot device (which is being assembled half from the surplus equipment market, half from new microcomputer equipment).

Input of text will be through a multi-user intelligent terminal assembled from components newly available for the amateur microcomputer market. This device will be capable of supporting one or more video displays, keyboards, and communication devices such as modems or high-speed parallel interfaces. Persons using this input device will be able to compose text messages, edit them, add keywords and enter the messages to the main processor with the aid of prompts, field delineation, dictionaries of keywords and data base headings, and whatever other amenities can be provided by an 8080 microprocessor. The cost of a multiple user terminal of this sort will be less than that of a single standard unintelligent terminal.

The main processor (an LSI-11 with additional memory), the disc (fixed head, 800 kbyte), and the tape drives (9 track 800 bpi) are mounted in a van-type truck. A medium speed printer is capable of operation connected to the main processor or the terminal. A portable power supply will enable operation at places remote from power lines.

In operation, the vehicle will arrive in a local area and set up the terminal in an adjacent community structure (school, church, meeting hall) or in the open air, protected by awnings which can be attached to the van body. A list of the existing keywords and data bases will be posted or otherwise circulated (ideally in advance of arrival). People will be encouraged to use the system as a bulletin board and to leave lists of keywords and data bases which they wish to have searched. Keywording will probably be based on a three level tree structure which will expand in number of levels as the system is upgraded in the future.

At the end of the van's stay the terminal is taken down and the "crunching" begins. Tapes are mounted and the newly-acquired information is merged into them. At the same time the data bases on these tapes are searched for items having keywords which have been requested. Files of these "found" items are compiled on the disc and are then sorted into "directory" format. In this format the text of the items is listed first, with keywords, followed by a complete index of keywords. Each entry in the index contains the first line of the items to which a keyword has been attached along with the page and item number.

The directories thus generated are printed (where multiples of the same directory are required the printer can generate masters for various duplicating systems) and are left with local contact people for distribution. The cycle is now complete, with data bases updated, so that the system can move to the next stop on its circuit.

While the urban CM system allows "browsing" as an interactive process using the machine, the directories of the cruncher allow the user to browse through a range of secondary or "pointer" information delimited by rough keyword boundaries. Since the user cannot immediately return to the machine to conduct a new search as his/her interests wander, the keywording process must be set up so as to result in "finds" of areas rather than items. Additions of new keywords must occur through a process involving agreement with a "gatekeeper" who maintains familiarity with an area of the data base and who can attempt to prevent the keywording from proliferating beyond reasonable levels. Such gatekeepers, or librarians, none of whom will be considered to "own" an area of information, will play an increasingly important role in the operation of CM systems as they grow. Their function will be to act as "entropy reversers" by constructing and maintaining their own indices and systems of reference.

Such systems with pluralistic indices will require more sophisticated hardware and software. The cruncher is relatively primitive in this respect, with its single index and long retrieval time. How will it grow from this initial level to a true CM system with minimal restrictions on the user and the information?

Initial contacts have already been made in the Northern California area with organizations interested in sponsoring the local operation of the system. It will be necessary for the initial run to have groups of people in each community where a stop is arranged who will handle the explanation of the system, the physical arrangements such as securing the space and structures for use during the stop, the provision of services for people who must travel inconvenient distances to use the system, and the other more synergistic events which can be affiliated with the "medicine show" mythology of the system.

These local groups can form the nuclei of local information centers. Starting on an informal basis, these groups will be encouraged to regularize their operations if the use of the system results in an expansion of low-level economic activity results from the existence of the directories and their timely update. If this happens the system can grow, and the local information centers will be the means through which this happens.

The intelligent terminal provides the means by which such a local information center can enter the direct operation of the system. Design of the terminal will be such that the block-formatted text which would ordinarily be passed directly to the main CPU can also be stored in serial format on audio cassette tape. If the users of a local area come to a point where they feel that the economic advantage given by the system warrants the cost, they will be able to purchase a terminal and put it into operation concentrating text onto cassette. Such cassettes may then be mailed or brought to the location where the system is currently located so that the frequency of update of the directories can be made shorter than the cycle of the vehicle on its circuit.

With the addition of a printer to the terminal and a modem the local terminal could concentrate text for telephone transmission to the main CPU. After sorting the results could be block-transmitted back where they would be buffered on cassettes and printed out at leisure. This upgrade would likewise wait until local users felt that it was justified.

When enough communities within a region come to this point, the next step would be for them to secure a central CM system configured for on-line interactive search and entry. Each intelligent terminal would be easily upgraded for multiple user operation at a relatively low incremental cost per user. By this time modes of use will have been well established, so that such an investment would not be made on a blind basis.

Further steps might involve the establishment of small (10 Watt) FM radio stations at regional centers with Subsidiary Carrier Authorization (SCA) so that the ultrasonic portions of their bands could be used for unidirectional data trunks. (The regulatory status of this mode of operation has not yet been investigated). Another alternative to leased telephone lines as data trunks might be optical (laser) transmission -- one unit is now being offered for \$3600 which claims 18 mile range through clear air at 9600 Baud.

The above development process is specific to a rural or otherwise non-urban area. The reason for this is that lower expectations obtain in non-urban areas as to rates of information exchange. This implies that the system will have more latitude for development of a favorable "myth" if it is first put up in a non-urban milieu.

This "myth" is perhaps best defined as the commonly-held set of understandings about the definition and modes of use of the system among the set of people who are likely to use it. Tools have individual myths which define the customary areas of their use. These myths are transmitted by language and are specified by the metaphors and similies used in the description of the tool. The process of the development of a myth is not well understood and is carried out intentionally within limited social and cultural areas by the advertising trade.

It will be necessary to cultivate a favorable and flexible myth for the CM system as it is built. To leave the mythic engineering to chance would be irresponsible and wasteful. We will be working on the development of the myth as conscientiously as if it were the most critical piece of hardware or software. Toward this end we invite comment and discussion.

On the grounds that performance is much less subject to argument than speculation, LGC Engineering has embarked upon the design and construction of a pilot Cruncher system. The main CPU, disc, tape drive and printer are on hand. A stable income base exists to allow the purchase of further equipment. The hardware for the terminal already exists in low-cost kit form. A software development system is available. We expect to have the pilot system in service by the early part of 1977.

Lee Felsenstein

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Vol. 1 No. 2

THE JOURNAL OF COMMUNITY COMMUNICATION is an irregular publication of LGC Engineering, dealing with the theory and practice of non-hierarchical communication systems.

At the time of its first publication (July 1975) it was hoped that JCC would facilitate the development of a "floating college" of individuals who would carry on the development of the theory and understanding of such systems as Community Memory. No way was seen of bringing into existence a realistic CM system without such a base.

To date we have not received as much participatory response as we had expected. Jim Warren, editor of Dr. Dobbs' Journal of Computer Calisthenics and Orthodontia (which deals with micro-size computer software) has reminded us that we are talking perhaps too much of what we are thinking about doing when we ought to concentrate more on what we are doing. As described above, technical advances in which we have participated have removed most obstacles to this course.

Accordingly, JCC will for the present become more of a newsletter on developments as LGC Engineering becomes more actively involved in construction of CM systems. Price will drop to the equivalent of two ounces postage (24 cents at this time, first class). Refunds will be offered to previous subscribers. Your balance is please notify us to how much you wish refunded.

Our address remains 1807 Delaware St., Berkeley CA 94703. Tel. (415)845-4736. LF

THE JOURNAL OF COMMUNITY COMMUNICATIONS

Vol. 1 issue 0

June, 1975

Published by LGC Engineering, 1807 Delaware St., Berkeley CA 94703 (415) 845-4736
Lee Felsenstein, editor

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Introduction

This is the initiating pre-issue (originally it was to have been a letter soliciting articles) of a periodical publication, hopefully monthly, whose purpose is to encourage and develop the dialogs which are starting concerning the desirability and possible forms of low- or non-hierarchical communications systems which can be created, shaped, and used by people in their daily lives as members of communities.

Recently the growing interest in such systems has centered around possible human applications involving computer technology, especially microcomputer devices. The publication of this journal was stimulated by the concentration of interested persons around the San Francisco/Berkeley chapter of the Homebrew Computer Club. This should not be sensed as limiting the discussion to cybernated systems, however. Such communications systems can operate with or without the inclusion of computer technology, and one of the major topics which we expect to be debated here is whether such technology should be incorporated in such systems.

As mentioned above, this publication was brought forth by the widening expressions of interest on the part of several people having different interests and outlooks. A meeting of some of these people was held at the Lawrence Hall of Science at the University of California at Berkeley on June 4, 1975, with the kind assistance of Pete Rowe of LHS. The discussion was directed along lines of laying the groundwork for a continuing series of dialogues which we hope will be carried on in the pages of this journal and elsewhere.

At this meeting we concentrated on identifying important concepts and questions. The list which emerged from the rather chaotic and brief discussion is enclosed. We hope that it will give the reader some idea of the prevailing directions of thought, but it should not be taken as a guide for limiting discussion.

As editor, I am asking for contributions, which need not be in academic format. I will try to take an inclusionary editorial stance and hope for a diversity of ideas and formats. I want this to be a communications medium for the "invisible college" of people actively interested in this field, not a tabernacle of the true faith.

Many readers may still be confused as to "what we're talking about". I suggest that they read the enclosed article by Lipkin and Colstad entitled "Community Memory: A Public Information Network". A reprint of this article was passed out at the above-mentioned meeting as a working paper, and describes an experiment of fourteen months duration.

A word on economics. The price of this publication is decreed arbitrarily to be \$1 per issue or \$10 per year. Since it is a spare-time, low-budget operation, I hesitate to solicit yearly subscriptions at this point. Thus, I suggest that those interested in receiving this journal remit \$1 for the next issue. If ten issues are actually produced monthly, the faithful will be rewarded with two free issues.

Lee Felsenstein

RELEVANT CONCEPTS AND QUESTIONS
developed at the meeting of June 4, 1975

Network	Membership/Economics	Interconnecting Indices
Rain Forest	Computer Utility	-philosophy
Platonic Form	Distributed Memory	-hardware
		Problem of Prostitution

Questions:

1. Why do it?
2. Is it worth computerizing?
3. What is the intersection with amateur computer activity?
4. What are the relevant quantities to such a system?
5. What is the possible relationship with cable TV?
6. What are the possibilities of radio, amateur or otherwise as a medium in such a system?
7. What are potential security problems?
8. How can an experiment be postulated?

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(The following is an extract from some papers submitted by Robert Liaas, who did not attend the meeting mentioned above, but who has been working independently on the conceptual design of such systems. Under the keyword-name RMI he served as one of several "gatekeepers" for the Community Memory system during its period of operation.)

...I propose a new information service which will field all questions posed to it, attempting to refer the caller to an expert, (a special agency, a person, a book, a switchboard, whatever) in the appropriate field. Below are some other features my system will have;

- If we can't find you a match, with today's active requests from other people, or with the standing orders, your request is placed on the "bulletin board" which anyone may browse.
- If you want to do something "now" (a chess game, for example) you don't have to wait a month, you might get a date within the hour.
- All terminology is acceptable. We will set up a thesaurus.
- Needs and resources are considered the same during initial processing, thus a group of people with common (similar) unsatisfied needs may meet each other and join forces, and a group of agencies that duplicate services may merge into one or clarify differences.

(From Generalized Computer Dating, available with others from Robert Liaas, PO Box 371, Mountain View CA 94042. (415) 323-0720)

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COMMUNITY MEMORY: A PUBLIC INFORMATION NETWORK

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ABSTRACT

For the last year the Community Memory Project has been demonstrating the potential of computer-based *public access* communications media with a small network of public terminals in the San Francisco Bay Area. From any terminal it was possible to search a common data base using boolean combinations of keywords or to add and index new information/messages of whatever nature the user desired. Both the ease with which the public accepted the service and the imaginative uses to which it was put were surprising and gratifying. The project is currently developing hardware and software systems to move the idea from an externally financed experiment to a cheap, self-sufficient service available in all the neighborhoods and to all the cultures of the Bay Area. These systems would supply the basic tools for establishing similar services elsewhere, and provision is being made so these regional networks could be linked to form a continental information sharing network. It is hoped that the project will serve as an inspiration for using the computer technology to meet real human needs rather than to make money.

After twenty-five years of computer development, the question is still open as to whether this technology can be directly useful to the public. People at present generally believe that computer systems are used on them rather than for them. Could computer information systems be accepted and used by the public? In most information-handling systems, people have no control over the way data about them are acquired and used. Information in these systems is used for monitoring of people by institutions, and is often regarded as useful if it is negative.

The few public-access systems are vertically organized, conceived primarily for delivery of computer-aided instruction and other pre-selected information, as thoroughly edited as in other forms of mass communication. The possibilities of horizontal, person-to-person data acquisition and delivery have not been explored.

Such a horizontal system would allow the public to take advantage of the huge and largely untapped reservoir of skills and resources that resides with the people. One-to-one communications media such as telephones and letters create no new links, while one-to-many connections such as television, newspapers and bureaucracies inevitably restrict the flow of information through their offices. Since political and economic power follows the lines of communication, the potential for abuse is tremendous. A large pool of information, freely accessible and

amendable through public terminals, is one of the few systems proposed for many-to-many communications.

A critical context for use of such a system would be in community based information centers rather than terminals located only in private homes. This might counteract the tendencies toward fragmentation and isolation so visible in today's society by significantly augmenting environments where small groups of people congregate and interact on an informal basis.

For the past year the Community Memory project has been demonstrating the potential of computer-based public access communications media with a small pilot network in the San Francisco Bay Area. From three publically located terminals it was possible to search a common data base for information or to freely enter new information or messages. The public accepted the service with remarkably little hesitation and put it to a much broader range of uses than was anticipated, proving that given the tools, the public will not only provide for its own information needs but will do so with great creativity.

This was a crucial question for the organization which spawned the system. Resource One, Inc. of San Francisco is one of the few public service computer centers in the country, a non-profit corporation devoted to charitable and educational uses of data-processing technology. Resource One had available an XDS-940 timesharing computer and ROGIRS, an efficient keyword based text retrieval package based on the MIRS system developed by Robert Shapiro of META. The software was modified to simplify the command structure for public use and to improve the security of the data and of other system users.

To use Community Memory, the user would type the command ADD, followed by the text of the item, and then by any keywords under which he desired the item to be indexed. To search for an item, the user would type the command FIND followed by a logical structure of keywords connected with AND's, OR's and NOT's.

The first port to this system was installed without fanfare adjacent to a bulletin board in a non-profit community record and music store in Berkeley. People were delighted by the chance to put a computer to use, frequently commenting that "it's about time!" They encouraged their friends to use the system, instructed one another in its use, and seemed fascinated as much by the possibilities of the medium as by the technology itself. This level of acceptance was not confined to the relatively sophisticated student area, but carried over to later installations such as one at a library in San Francisco's polyglot Mission District.

Initially the location of the terminal and its popular characterization as an 'electronic bulletin board' determined the public's expectations and uses of the system. Installed during the August housing crunch, it became immediately useful in the students' searches, with the rate of success growing with the size of the data base. Musicians, always in search of others with whom to practice, entered themselves and their special areas of interest. Instruments were bought and sold, producers found new opportunities, and groups advertised their availability. New groups, in fact, were often assembled on the spot from leads found in the data base, and from people waiting around for their turn to use the terminal. Similarly, people used it to assemble car pools, organize study groups, find chess partners, and pass tips on good restaurants. Interesting and unanticipated uses developed: poems, graphics, dialogues among strangers, and items most analogous to letters to the editor, but much freer in content and form: instant publication by a 'very small press' had become available to all who claimed literacy.

The rate of use of the system was fairly high and constant in relation to the environment of the terminals. About fifty searches and ten additions occurred each day at each location. Given the length of individual sessions with the system, this was at least one-third the maximum capacity of a terminal.

The crucial factor in determining the manner in which the system was being used was the rate of success, which in turn was determined by the data density for each subject area. A bootstrapping effect brought the density up slowly to a critical level, after which usage rose rapidly to a maximum level for that application. This critical level was never reached for certain roles in which the system would be uniquely valuable, such as a skills bank, learning exchange, forum for ad hoc organization, or barter marketplace. Since no institutions have filled these information needs, they are not generally expected to be met, but a significant number of users independently innovated these applications of the system.

The bootstrapping principle was self-evident in operation, and a number of individuals stimulated the process with bulk entries in their own special interest areas. These gratuitous offerings of information contributed strongly to the richness, diversity, and utility of the data base. Information degrades, however, and the responsibility felt by these users for maintenance and updating could not be effectively dealt with or assessed. To safeguard against unilateral censorship or destructiveness, the public had no editing privileges, although a number of people clearly could have been trusted to shepherd parts of the data collection. The system provided for maintenance by requesting a deletion date at the time of the addition, but this proved inadequate for all but the most 'classified ad' type of entry.

Malicious and obscene items, trivia, and misinformation represent the major opportunities for abuse of the system. In practice this kind of misuse was not prevalent, but scanning for it increased the maintenance responsibilities of the pilot project

staff. An attitude of 'caveat emptor' has been advocated in this regard, since the content and relevance of the items the user finds can never be guaranteed. The editorial processes that have evolved in other media are not completely successful in this context, nor are they readily transferable.

Other inherent problems appeared due to inexperience on the part of the users with typewriter keyboards, spelling errors, and misunderstanding of the keyword concept. The social interactions around the terminals have been the only way of dealing with these difficulties.

The other deficiencies encountered in the operation of the pilot system can be effectively dealt with through redesigned software. The primary consideration in current design plans, however, is maintenance of conviviality in the interactions with the users. People must gain a sense of understanding of and control over the system as a tool. While it must command sufficient intelligence to recognize and respond to the most naive user, that intelligence should be directed toward instructing him, demystifying and exposing its own nature, and ultimately giving him active control. Meeting this criterion without placing excessive demands on the user deeply tests the system designer's ingenuity.

This is especially relevant in the case of the current design strategy, which includes the implementation of a tree structure of categories as a parallel and alternative mode of searching for items. This would allow users unfamiliar with the system to browse through a structured environment of hierarchically categorized items while enabling more experienced users to search directly on content with the system in a more passive mode. Any such categorization scheme is necessarily biased by the paradigm with which the designer interprets and organizes the world. Minimizing this effect complicates the system and challenges the design group.

Other innovations under development include the implementation of named fields to aid narrowing the searches by date and value. Item ownership will allow 'information shepherds' and organizations such as switchboards and other referral agencies to maintain subsections of the data base for their own use while sharing it with the public. Dialoguing and conferencing will be more explicitly supported, while games and other special purpose programs will be available to various users.

The pilot system, supporting few terminals on a large, expensive general-purpose time-sharing computer, was not economically reasonable. Through careful mathematical analysis it has been determined that by using an optimized file structure, good searching procedures, and a thoughtfully coded mostly core resident program, more than 64 simultaneous users could be serviced by a 24K mini computer the speed of a NOVA or PDP 11/40. Such software is currently being developed along with custom terminal multiplexing hardware which will greatly reduce the load this many terminals place on the CPU. With the broad base for capital and maintenance costs this system provides and the

use of the low-cost, people-oriented Tom Swift Terminal described elsewhere at this conference, costs should be less than \$2000 per public access site.

Each of these minicomputer systems will be capable of networking with others, exchanging information of a non-localized nature, and providing a nationwide conferencing medium. Groups such as Infact in Vancouver, B.C. and the Boston Children's Museum are contributing to the design of the mini-system while testing concepts with their own systems based on Community Memory. A cooperative effort seems the correct way to bring about systems for information sharing.

The cooperative use of technology to meet human needs, rather than its competitive use to create lucrative mass markets in electronic elaborations of simple devices and services, is the basic goal of the Community Memory project. This sort of direction is a sadly rare style among engineers, programmers, analysts, and the people who coordinate their work. But the issues of how and for whom the technology will be made to perform are becoming ever more critical. They play a deep role in the continuing economic, ecological, political and energy crises. These issues must be dealt with by both the people who have mastered and currently control the technology and those people it is claimed the technology is serving. But the heaviest responsibility lies with us, who create with the technology, to be conscious of the significance of our creations and to actively make sure that they are directed toward the greatest good.

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COMMUNITY MEMORY UPDATE

July, 1975

The previous article, "Community Memory, a Public Information Network", was written in October 1974 for presentation at Comcon '75, the semiannual convention of the Computer Society of the I.E.E.E.

At the time of its submission, the Community Memory system was still in operation. The San Francisco Public Library Mission Branch had submitted a funding proposal for expanded use of the system, and Resource One was working on establishing a storefront presence in San Francisco, both for Community Memory use and for accounting work in support of non-profit community organizations. A voluntary contributions box at the Berkeley terminal was accumulating small amounts of money.

No funding proposal came through, however, and Community Memory was shut down in January of 1975. The reasons were primarily a matter of economics and secondarily a matter of personal exhaustion on the part of those of us who had put and kept it together.

The primary factor in both of these considerations was the machine on which the system was put up. The XDS-940 was the first machine designed for timesharing, and is a "big" second-generation computer. It requires ten tons of air conditioning and swallows 23,000 watts of electricity (including air conditioning). It relies on the operation of high-speed magnetic drum memories for "swapping storage", and these drums were worn, obsolete, and without a source of replacement. Several times they failed, making the system unusable until patches and critical re-adjustments could be arranged.

As the person responsible for the hardware maintenance, I recall the daily dread of knowing that the drums were running with no margin for error and were apparently progressively deteriorating. I could not recommend the inauguration of extensive public service projects which would rely heavily on the future reliability of the equipment.

The software was likewise a problem. The operating system was salvaged from the corporate wreckage of the Berkeley Computer Corporation, put into operation with the talented help of several of the men who had written it, but was otherwise without high-level support. Paralleling my experience with the hardware, Efrem Lipkin had to spend a great deal of time and exasperation stroking, patching, and otherwise trying to outguess the software.

It was apparent that any expansion of the Community Memory system would be impossible without a higher level of reliability or of support using the 940. We had intended initially to institute charges for the use of the system soon after starting it, but we never felt capable of delivering the performance which such charges would necessitate.

Rather than dedicate ourselves to the huge effort of making such an obsolete system work, we decided to close down the local experiment (Vancouver had started its own version in July of 1974) and concentrate on putting together the parts and concepts which would be necessary for the re-establishment of Community Memory in a widely-available, reliable, and flexible form.

This effort is currently being carried out under the auspices of LGC Engineering, but it may soon shift to other Bay Area institutions if work under way is successful. This Journal is part of that process, and substitutes for the "mediation" cited in the footnotes of the previous article.

Lee Felsenstein

The Tom Swift Terminal, A Convivial Cybernetic Device

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As presented before the Tenth Computer Society International Conference of the
Institute of Electrical and Electronic Engineers, Spring, 1975

1. CONVIVIAL DESIGN AND HUMAN ECOLOGY

"Comes the revolution, youse will all eat strawberries an' sour cream!"

"I don't wanna eat strawberries an' sour cream!"

"Comes the revolution, youse will do like you're told!"

Well, here we are carrying forth the cybernetic revolution, with microprocessors in every bathroom, and I wonder how many of use feel that the people at the end of the process, the ultimate consumers, don't appreciate what we're doing and will simply have to do as they're told. I shouldn't have to remind you that there is a strong resentment against the direction of technological development among people in the street. They feel a general uneasiness about the fact that technology tends to remove their ability to exert control over their own lives, and they don't like it.

What's the matter with these people? Don't they understand what we're doing for them? Don't they understand that our intentions are only the best?

Or perhaps we don't understand the effects of our own systems.

I am arguing here that there exists a human ecology which is affected by our work as makers of tools and systems, and that the industrial criteria of design with which we are all familiar does not take this fact into account.

An example; the development and widespread availability of solid-state radio receivers for consumers is a triumph of the industrial system of values; more receivers were produced which were cheaper and more portable than before. Industrialists will still point proudly to these figures. But within the human ecology there was an unforeseen effect.

As a part of the design change, repairability was sacrificed. Since the new technology was more reliable than the old, this was seen as rational. You didn't fix a transistor radio, that would be more expensive than buying another. So manufacture was cheapened by using house-brand semiconductors, thinning the printed-circuit board foil, tack-soldering, etc.

But with that repairability went the opportunity for people to pry around inside a radio. Every 13-year-old had a radio, but none of them had any incentive to learn what went on inside. If they fooled around with it, it fell apart. Why bother?

Now that generation of 13-year-olds has grown up and the electronics industry is talking about a shortage of technicians. Is there a connection?

The conventional industrial wisdom says that this trend is inevitable, that progress always means increasing sophistication of tools and systems, increasing distance between managers of the tools, the designers, and the public in whose name they are used. Access to the new tools is closed off, and education, which is treated more and more as a commodity, is required to gain access to and control of the tools.

People are supposed to accept the inevitable and adjust their lives to the demands made by the new tools and systems. Drugs are suggested as an aid to this process.

I wish to propose that this direction of increasing alienation is not inevitable; that different criteria of design are possible which can reduce the distinction between the user and the designer, and can expand the ability of people to assume control over their environment and their destinies.

A suggested term for such criteria is "convivial" as opposed to "industrial". This usage was proposed by Ivan Illich in his heretical book, "Tools For Conviviality"; published in 1973 by Harper & Row.

My example here will be the design of a terminal for a publically-used information storage and retrieval system, a sort of electronic bulletin board which was called Community Memory and is described elsewhere. The terminal had to be useable in a wide variety of environments and configurations, capable of being reconfigured to higher levels of "intelligence" in the field as the system grew, and above all, capable of inspiring trust in the people who used it, people who were generally untrained in the use of computer equipment.

The industrial approach is grim and doesn't work. High-quality burned-in components, armoring and potting of subassemblies are some of the strategems used. The design motto is "Design by Geniuses for Use by Idiots", and the watchword when dealing with the untrained and unwashed public is KEEP THEIR HANDS OFF!

The convivial approach which I want to propose as an alternative involves taking the human ecology of the situation into account. First of all, the device is to be used in a context. Some people will be nominally responsible for it where it is installed. This strategem allows them to participate in the configuration and maintenance of the device and allows them to learn continuously about the way it works and what they can do with it. An important approach here is to reduce the distinction between use and training. The device is designed to be an educational toy as much as a "useful tool".

Hopefully, the people who enter into this relationship with the device will be able to diagnose faults, effect minor repairs, and in effect provide useful input for design support and modifications. To help develop this capability provisions must be made for the organization and support of a users' group or other forms of lateral communication among users of the device.

In short, the convivial approach that I suggest would rely on the user's ability to learn about and gain some control over the tool. The user will have to spend some amount of time probing around inside the equipment, and we will have to make this possible and not fatal to either the equipment or the person.

In honor of the American folk hero most likely to be found tampering with the equipment, we have named the device the Tom Swift Terminal.

2. HOW THE DEED WAS DONE - TECHNICAL DETAILS

First, we viewed the device from a general standpoint. We wanted a terminal which behaved initially as a Teletype equivalent with backspace capability. Display would be on a video monitor and could be handled by a home TV set. Printers and multiple keyboards and screens would have to be added later, so it was obvious that the device was best visualized as a small memory system remote from the computer to which a large number of attachments could be made. This implied an orderly expandable bus structure, and a semi-synchronous three-state TTL bus was designed sufficiently wide to handle 16-bit microprocessors without problems. This meant 16 address lines and 8 data lines, as well as 4 control lines.

Memory was designed in 1024 byte increments using 2102-type semiconductor RAM operating at 1.0 microsecond. Increasing the memory size thus meant plugging in another card to the bus. The top page of addresses was reserved for status registers used in control of devices connected to the bus. A daisy-chain priority system was decided upon.

A display card contains the character generator, sync generation circuitry, and video circuitry. Screen refresh is performed directly from the memory card, so the display card manages the repetitive block data transfers which this process requires.

The actual execution of these transfers is carried out by the block transfer card, to which the display card is connected. The block transfer card is essentially a DEIA controller, containing four 16-bit registers, a 16-bit up/down counter, and a comparator. Through a generalizing design process, though, it has been configured as a "stupid processor" capable of either handling fast block transfers or of laboriously performing the rather simple screen-management editing algorithms.

This editing is performed under control of the input/editor card, which also connects to the block transfer card. A three-state bus on the front edge of the three cards just mentioned allows the cards to be easily interconnected. The display card always has priority to this bus.

The input/editor card, which contains a UAR/T through which it listens to the keyboard and external modem, is otherwise a small ROM controller, with up to 256 8-bit words of ROM, an address counter, skip and subroutine circuitry. This shares the resources of the block transfer card to feed characters into memory and updates the values of the three status registers included in the first "basic systems". These registers respond to the six highest memory addresses and are actually stored in the registers in the block transfer card. They represent the beginning-of-screen address (BOS), end-of-screen address, (EOS), and the equivalent cursor address (CRS).

In future, more intelligent applications, a microprocessor may be easily interfaced to the bus and the memory expanded to allow program storage and scratch space which is not displayed. The block transfer card continues to be required for screen refresh transfers, and could also be shared with a low-priority output device such as a line printer. There seems to be no visible limit to the number of configurations and applications possible with this system.

There is a growing field of amateur computer activity around the newly-available microprocessor chips. To encourage the use of this device in that milieu we have included what we call "hexagram display" as an optional means of allowing visual presentation of binary. The eight-bit number is displayable as a stack of eight solid or broken lines where characters are ordinarily displayed. This allows debugging of machine-language programs by users who have no familiarity with or even tolerance for conventional editing and debugging programs.

3. CONCLUSION

The example which I have been discussing is only a crude first attempt at using incompletely-developed design criteria. I urge that designers and engineers begin the development and refinement of these criteria.

The initiative for a design philosophy more in accord with the human ecology will have to come from us, and not from those in positions of economic or managerial control. Convivial designs are not good for maximizing the wealth of individuals. The point of putting such heresy into operation is to allow our efforts to maximize the wealth of society in a rational and humanistic context. I believe that it can and must be done.

Some Indications for Community Memory

1.

"Community Memory" may not be the right name. Most of the memory involved is (desired to be) of the shortest term; the system is not past-oriented, but is more an attempt to deal with the real-time complex of community data. "Community Data" is a more accurate name, or perhaps "Community Data Connection", or "Community Data Exchange". "Community Information" may be best.

2.

The system is inescapably political. Its politics are concerned with people's power — their power with respect to the information useful to them, their power with respect to the technology of information (hardware and software both).

The system democratizes information, coming and going. Whatever one's power status in society — titan of industry, child of welfare recipient — one can put information into the system and take it out on an equal basis, provided its terminals are freely accessible and (relatively) free to use. It is a truly democratic and public utility, granting no one special privilege (provided its software can teach any user to operate it with sufficient skill for her needs.)

Put it another way: in this system no person or group can monopolize or otherwise control people's access to information. Information-power is fully decentralized. No editing, no censoring; no central authority to determine who shall know what in what way. Of course this means that no authority is responsible for providing "enough" information in the system; it must make do with whatever people choose to put in, on a democratic basis. Likewise this means that no authority is responsible for certifying, directly or implicitly, that any information is "right" or "accurate". Users of the system must take responsibility for their own judgements about its data, supported by whatever judgements other people offer to them through the system (see 5 below) or outside it.

Yet another way: in this system no central authority, person or agency mediates people's communication and transaction with each other. The system functions simply to facilitate people's direct contact and contract with each other, nourishing an ultimate participatory democracy.

In all these ways, the operational politics of the system are deeply democratic — rather than implicitly authoritarian/centralized, as most of our systems of information-handling are. I am putting this all quite abstractly. To grasp the alternative clearly, it is enough to just recognize the ways in which computer-based information systems are coming into public use: in schools, to teach mass pre-packaged programs; in industry, to deal out narrowly organized bodies of data to those with the power to command special access.

3.

The sixties have passed, but the cultural changes they were watershed for are still developing — and we can see, in the Bay Area, certain concrete indications of new customs of public information, which have grown in response to people's felt needs for new forms and styles of service.

The flea market gained middle-class popularity; now on any sunny Saturday, driving through Berkeley, one encounters dozens of yard sales and garage sales. In a swirl of random molecular efficiency, people are sorting through their tools and toys and finding ways to exchange them — if still with the dollar as a currency of conversion, in other ways face-to-face, without middlemen. The classified sections of newspapers:

have not much grown; rather a new kind of paper covers the local community market -- Classified Flea Market, a cheap open advertising system with random-public-access distribution, putting out 40,000 copies of some 2,500 ads biweekly.

But not only tangibles are being exchanged. Heliotrope and the Open Education Exchange are local versions of a community free university -- forums where people with something to teach, of any sort, connect with people who want to learn. Again the educational exchange is without any middlemen, with only the most minimal central technical facilitation, in radical contrast to established schools. Each education exchange advertises its courses by a periodic random-public-distribution catalogue -- but they charge teachers 30-50% of the gross for this service, reaping a mint and upping the general price for learning.

In the back pages of the Berkeley Barb, each week a thousand ads for sexual services and partners are made public. The ads are picaresque and deviant; some people disapprove of their existence, others merely snigger vicariously. But again we have the phenomenon: people feel real needs of a certain personal sort, and they seek or make a forum to make their needs or offerings public, and to exchange services directly.

The several massive rental services that have developed are of the same order; but it's worth looking at why they did develop, given that the "for rent" sections of newspaper classifieds already serve this function extensively. The rental services, in contrast to the newspapers, represent an extensive and specialized pooling of information. They concentrate more data in a more convenient form; they keep it more up-to-date, which is a major advantage; and you don't have to throw away the front sections as irrelevant. Their capacity to deliver more precisely specialized information is in the process of being developed, with computer assistance.

These four examples point a common theme. There are of course many specialized goods-and-services exchanges in our society, some of which operate "without middlemen" -- e.g. the "books wanted/for sale section of The Antiquarian Bookman -- with neither editing/censoring nor outsider's profit to perturb people's direct interaction. But these examples go beyond such traditional forms, in at least two ways. First, they tend to be radically public, in the sense that they offer specialized exchanges to as wide and unspecialized a public as possible. Second, they tend to focus centrally on the interchange of information itself, indeed to generate systems whose prime purpose is to facilitate only this (e.g., they do not offer real estate news, alumni clubs, etc.).

What all this says, to me, is that people are seeking direct, unregulated, unmediated ways to come into contact and interchange. It is a social pressure, born of the cultural changes of our time. There is no telling what its potential is, or how many areas it may wait to invade, because the proper mechanisms for its expression have been lacking, and are only now being developed in a piecemeal way. A Community Information System, sufficiently developed, would seem to be the ideal vehicle for its expression: indeed, a public utility.

4.

One thing exciting about the trial run of the Community Memory system is that it demonstrated, on a small but immediate scale, the diversity and flexibility of uses that may be expected to flourish in a larger scale system. One terminal was placed in a record store, where many musicians come. Besides advertisements for instruments, recommendations about records, and notices of performances, the system was also used as an organizing tool: musicians looking for others to form or fill out groups, and those wanting to join groups, found what they wanted -- not because it was provided for them, but because their expressed needs filled an empty container. In the same way, another terminal, placed where people with apocalyptic visions came, accumulated apocalyptic messages.

If the tool is multi-purpose, and free to the uses people invent, they will invent in response to their needs and desires. There is no anticipating the breadth of the use.

they will make; nor any way to provide for these, except by making the flexibility and useability of the tool as great as possible.

In this again we must recognize the contrast to the present dominant approach to information systems. From pocket calculators on up, the tendency is to design hard- and soft-ware which meets traditional needs better, or which is meant for new special needs that the designers anticipate. The planning process which satisfies needs is centralized and hierarchical, benevolently efficient — but it cannot make provision for, and may indeed actually foreclose, the uses that cannot be anticipated, especially those invented in free play.

5.

In an open information system, we can expect both play and necessity to give rise to new orders of information and new forms of social relation.

To take a simple example; in the Bay Area there have been developing a wide variety of new healing practices to augment traditional medicine. Acupuncturists, polarity therapists and psychic healers would use the system to advertise their services — entering information not only about their availability and prices, but also about the nature of their practices. Call this "first order" information. For the first time an organized public process of related first order information from patients will become possible: for the patient who feels he has been harmed, or has benefitted, from a certain practice or practitioner will have both motivation and the means to make his view available to others seeking aid. The "evaluative and policing" function will begin to escape the monopoly of medical societies and governmental agencies, and be performed directly in democratic interchange.

But whose views can you trust, in a system that doesn't tell you what to think about the information it carries? So second-order information and informants will begin to accumulate. The woman with a pain in her back, hesitating between the advertisements of osteopath and surgeon, may be able to find entries discussing the therapeutic alternatives, inserted by med students or disinterested do-gooders. The doctor whose treatment has been trashed will enter in public his rebuttal of the complaining patient's accusation; the patient will add his own address for the benefit of anyone who find out more about the incident; the back-sufferer who has scanned all the relevant listings to determine which healers have the highest current ratio of client satisfaction to dissatisfaction will insert and date this information; the county medical society will enter its recommendations also.

In such sophistications, we can recognize the kind of "natural" democratic information process that presently occurs as we sort around through our friends' experiences and prejudices, the Yellow Pages, and the library for advice about treatment. But its extent and efficiency will be greatly augmented. The vigor and diversity of criticism of information will increase, and new functions and roles of criticism will appear. In each area of information exchange — used car sales, vacation advice, religious proselytizing — we can expect to see a variety of informal "gatekeeping" functions to emerge, and people affiliating with the system as shepherds and artists to serve them.

6.

What's in this for computer freaks, and why should they be the ones to design and develop such a system?

Precisely, I think, the joy of seeing a beloved toy given to everyone to play with. They have been concerned with technology not for its most narrowly visible utility, nor for the sake of the profit to be derived from defining and controlling its uses, but out of the sheer wonder of invention, discovery and play. It is appropriate they be the midwives of a public system designed to embody this spirit, of free, unregulated, and creative exploration.

Indeed, it may well be that this spirit will not come to be realized in a public computer utility system unless its prototype design is determined by such amateurs; for there are many reasons to expect commercial utility development to be less community-oriented, user-responsive and -involving, and felxible. (The expected limitations can be foreseen in grim detail from the two imperatives which will be honored in standard commercial design : the system itself will be highly profitable to make and run, and thus costly to use and unjustly selective in its corresponding choice of users; and its operation will be limited in ways which protect, as much as possible, the present concentrations of economic and other power affected by the information it is designed to carry.)

But this wanders from computer freaks, the boys (alas!) with their toys. As people interchanging hardware and information, announcing computer courses and so on, they would be users of the system on the same basis as other citizens. But they might have a special task and pleasure. Community Information offers the richest potential of full technological conviviality of anything on the horizon now. A full system would offer the user instruction on how to maintain, repair, modify and understand the hardware, and even more the software. It would teach the user how to use it.

This is a simple and dynamite proposition, with the most sophisticated implications for programming and programmers. The first level has been forseen in the initial tests of Community Memory: the machine says, "These are the categories of information I carry, this is how you call them up, how you enter material; please don't hit my keys too hard." But the higher levels have been anticipated only by the programmed injunction, "Touch me!", by which the machine, as an experienced lover, greets the virgin.

Not simply how to handle information, but how to think about handling it, how to feels about using it -- these are the potentials that open. We shall have a system with awesome potentials for use and play. How can the machine help the user learn to make the most of them? This suggests learning programs of a kind and sophistication that have nowhere yet to be explored, a true challenge.

For it is not a known kind of learning which is to be taught, established routines of access and use; but rather the creative exploration and mastery of unknown potentials -- both of the technological system itself, and of the individual identities and human community with which it grows in intimate interface. In this respect what the system's programmers will be responsible for facilitating is not the narrow learning of "how to use the computer terminal", but the ultimate act of learning about learning itself -- providing perhaps the deepest dimension of that Community Information which empowers democratically.

Of course the system should be designed so that this teaching and learning can develop, again, in a democratic community interaction via the computerized prosthesis. But the seed the system's designers plant will help to determine what grows in the fertile soil.

Michael Rossman

(The author has been an active participant and observer in most of the events in the Bay Area which signalled the growth of a student- and youth-oriented political/social subculture. He has travelled and worked extensively around the country as an organizer for educational change. For more details see his two books, The Wedding Within The War and On Learning and Social Change (Vintage V-831), both out of print.)

THE JOURNAL OF COMMUNITY COMMUNICATIONS

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Lee Felsenstein, editor

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LETTER TO THE EDITOR:

Dear Lee:

Just finished reading first issue of Journal of Community Communications. Needless to say, I was disappointed. It appears you've started with an answer (computers) before asking the question of how to develop community communication systems that are open for public use. I'm sorry the Journal has such a narrow focus on computers and isn't really serving as a forum for alternative community communication processes. I'm personally aware of a lot of excellent non-computer processes. Do you plan to limit the scope in the future?

Honestly concerned,
John W. Warden
355 "C" Street #203
Springfield OR 97477

THE EDITOR RESPONDS: I believe that I can lay Mr. Warden's qualms to rest by quoting from the introduction to Issue 0 (paragraph 2, line 5-8): "This should not be sensed as limiting the discussion to cybernated systems, however. Such communications systems can operate with or without the inclusion of computer technology, and one of the major topics which we expect to be debated here is whether such technology should be incorporated in such systems."

Mr. Warden's question does illustrate a more general question which I must constantly address when talking about Community Memory systems. That is; "are you not simply trying to find a use and a justification for your favorite toys?" This is certainly a valid question for any technologist to have to answer and consider. In my case, I refer the questioner to the "Community Communications Proposal" on the over-leaf, which was an attempt to define a non-computerized nationwide network. That proposal falls apart where it proposes "professional standards of service" -- to be implemented by the melange of "freak-revolutionaries" (my phrase) to which it was presented.

This in turn raises another question; what is there to ensure that a community communication system will be trusted by enough people to make it useful and self-sustaining? Judging from the amount of non-cooperation between various switchboards in the SF bay area during the time when I was investigating the possibilities of a co-ordination of their efforts, the answer was "not much". People started and worked with switchboards for the darndest reasons. The user of the information exchange service they provided had to filter their information through some unseen person who would categorize, file or search using criteria of meaning which were not immediately apparent to the user. Someone new would arrive, re-organize the filing system around their own world-view, become the living index to that file, "burn out" from overwork and under-support, leave, and the cycle would repeat.

The principle which I would like to propose for discussion is; in a community communication system, the user must be able to manipulate the filing technology without the intervention of third parties. In a future time, when society has re-structured itself into a less atomized model, this may no longer be true. But how do we get there from here?

I look forward to hearing from Mr. Warden and others on this general topic. As mentioned above, the pages of the Journal are wide open to contributions.

COMMUNITY COMMUNICATIONS PROPOSAL

PROPOSED: that an organizing committee for a Community Communications Network be established; that the communications network be envisioned as non-hierarchical, a non-broadcast system of decentralized community switchboards and information files along with sub-systems of neighborhood communication centers; that the purpose of this system be the creation of viable communities through the availability of communication services to the people; that professional standards of service be established to insure the people's trust in the system; that the organization of this system not be considered as competing with any action proposals put forth at this convention.

MOTIVATION: A common understanding is growing among us that we need a communication system in order to facilitate any revolutionary or even radical action.

To date we have relied on mass media, and mass-type (or "broadcast") media such as posters, leaflets, comic books, etc. to transmit information. We have seen the form of these media distort and modify the content of our information, by virtue of their show-business nature. The Yippies know how to get themselves across in these kinds of media, but the result has only been a new kind of amusement.

The communication network we need must be of a non-hierarchical, non-broadcast nature. It must be a system which will enable any person to reach any other person who shares a similar interest in the information.

The function of this system will not be to transmit streams of directives and other heavy, military-type material. Its function will be to build local communities which are "together" and linked with each other. Revolutionary practice is built upon the organization of such communities (like the Vietnamese villages). We have no such communities, because we have been conditioned to accept a spectator's role in the information flow. Until we can stop being an audience and start forming communities, we will pose no serious threat as far as the ruling class is concerned.

In the envisioned system, each area capable of supporting a community will have a central switchboard and information file, which will be recognized as the place to go for general information, and through which information can pass to other communities.

These centers can also contain layout and printing facilities for use by trained people. Along with this center will be a net of neighborhood communication centers. Each will be a local switchboard/information - message file center. They will maintain bulletin boards and supply materials to people who wish to post a notice. They can also function as hangout centers to provide the communication service performed by marketplaces in small villages.

Each neighborhood center can distribute printed materials through hand carriers to routes of people who request the service. These hand carriers can form a local "people's post office" if it is needed. Phone traces can be organized and run from the neighborhood centers. Periodically the whole community can come together and in one day compile a directory of who they are and how they can reach each other.

This system is useless unless it can retain the confidence of the people. This is best assured by publicizing and implementing professional standards of operation to prevent the people who operate the system from modifying the content or context of the messages they handle.

Some people may suggest that a system of this sort will give the pigs a gold mine of information. This danger must be weighed against the danger of continuing as we are now, with no communication system we can rely on.

* * * *

Editor's note; The above paper was presented by myself to the Mayday Convention held August 1971 in Atlanta Ga. It had been my understanding that the purpose of the convention was to establish a nationwide communication network. The rhetoric was appropriate for the occasion.

REPORT ON THE STATUS OF THE TOM SWIFT TERMINAL DESIGN

The primary objective in the design of the Tom Swift Terminal was to produce a device which encouraged the involvement in computer hardware of amateurs who would not otherwise have incentive to do so. Such involvement was intended to solve the projected problem of hardware reliability in the Community Memory information retrieval system by ensuring that each hardware installation attracted a group of technically-minded amateurs. Problems of maintenance and system configuration could be ceded to these groups, which would perform a significant humanizing function for the system as a whole.

The Tom Swift design was conceptualized as a bus-oriented memory system designed for direct memory access (DMA), in which several devices sharing the memory bus can gain access to control of the bus. In its initial system configuration, it would operate as an "unintelligent terminal", accepting data from a keyboard or communications line and displaying it on a user-supplied video monitor. The system would be expandable in intelligence through the addition of microprocessors, additional memory, read-only program memory, more displays, printers, etc. The ultimate configuration was not determined, since multiprocessor arrays were feasible.

This design was generated as a result of the serendipitous response to the first piece of amateur computer hardware, Don Lancaster's TV Typewriter (now known as TVT-1). Appearing as a cover article in the September 1973 issue of Radio-Electronics magazine, it drew a response of 10,000 paid requests for designs. In a subsequent telephone conversation, Don mentioned to me that his next TV Typewriter would use random-access memory, rather than the structurally rigid shift register memory used to date. This concept stirred the realization that a small patch of memory in the amateur's hands could be cultivated to grow into a whole computer, given the proper framework. The preliminary specifications for the Tom Swift Terminal were the result. The name stemmed from the desire to cater to the "Tom Swift market" of users.

It was not at all clear at that time whether such a market existed, despite the response to Lancaster's article. Early in 1974 the Mark 8 microcomputer kit was announced, and a newsletter grew up immediately to enable the hundred-odd builders of that design to cross-communicate the numerous fixes and modifications necessary to make that design (based on the Intel 8008 microprocessor chip) operate at all.

In January of 1975 the first "full scale" microcomputer kit was announced by Micro-Instrumentation Telemetry Systems (now MITS, Inc.), a small maker of electronic test equipment and calculator kits facing prospective bankruptcy after its market for calculator kits was undercut by the calculator price war. Their Altair 8800 was based on the Intel 8080 microprocessor chip, which can lay claim to being the first device capable of all the functions of a minicomputer. An initial production run of 40 was planned, later increased to 100 as the publication date neared. The response to the article deluged MITS with orders, and approximately 5000 Altair kits have been shipped as of this writing.

This was the signal event that brought the Tom Swift market out into the open. The first meeting of the S.F. Bay Area Homebrew Computer Club was organized to examine the first Altair to reach the San Francisco region, and similar associations formed independently around the country for the purpose of bringing together people who were

intrigued with this "affordable computer". The result of this convergence of like minds has been the development of a small, highly innovative industry producing amateur-oriented microcomputers and their peripherals.

The corollary result has been that the Tom Swift design has been superseded in its primary design objective. The Altair 8800 is a bus-oriented design, making expansion possible through the addition of plug-in modules. An upcoming design by another manufacturer, the Astral 2000, is likewise bus-oriented using the Motorola-designed 6800 microprocessor. IIS Associates has introduced the IISAI 8080, a computer having every module interchangeable with the IITS 8800 modules. Processor Technology Inc. has built a thriving business making "third party" plug-in modules for the Altair 8800 or IISAI 8080.

In the midst of this frantic activity, I decided to shelve the Tom Swift design at least temporarily and to concentrate on designing peripherals for these computers which would make possible the same kinds of system configurations as were intended for the Tom Swift terminal. To date I have completed a video alphanumeric display module for Processor Technology (the VDI-1) and a 103-compatible modem kit (the Pennywhistle 103, to be announced officially in February). Designs to be completed within two months are an adapter module to allow the VDI-1 to operate as a stand-alone "unintelligent terminal", and a video alphanumeric display module for the Astral 2000. Following these will be a 32-column printer with plug-ins for both types of computers.

With the completion of these plug-ins, the Tom Swift Terminal design will be functionally obsolete. I may continue to develop the idea of decentralized processors in the future, but I will be turning my primary attentions to the development of Community Memory type information-exchange systems. I realize that some people may be disappointed by my apparent loss of interest in pursuing a promising design, but I have decided to fix my sights a little higher and pursue a promising system. Also, working with Processor Technology has convinced me that I would not enjoy in the least dealing with the problems inherent in a manufacturing situation.

Some people who have examined my preliminary specifications will no doubt be pleased to find that the Astral 2000 will incorporate almost the identical bus structure. I am likewise pleased to see this, since I had nothing whatever to do with the design of that machine. Apart from the unintentional flattery, the pleasing aspect of this is that ideas for configurations or applications which may have been encouraged by my original specifications can still be realized with minimal changes despite my abdication from the role of prime mover.

-- Lee Felsenstein

NOTE: I will be in Albuquerque on March 26 through 28th during the "World Altair Convention", where I will be interested in meeting others who wish to exchange ideas for "Tom Swift" hardware and systems, as well as elaborating on my current designs.

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A COMMUNICATIONS NETWORK FOR CHANGE IN HIGHER EDUCATION
by Michael Rossman
A Real Model of a Specialized Communication Network

In the mid-Fifties, when I knew its world, science fiction/fantasy (s-f) was a young literature with an audience of perhaps 200,000 in America. This population was rich in scientists and intellectuals and social deviants - or freaks, as they're called now. Within it was a subgroup, largely of freaks, who formed a loose nucleus held together by friendships, avocational bonds, and a specialized communication network.

S-f was rich with esoteric references to this nuclear society. Its members were writers and magazine people, collectors of magazines, specialists of the literature and its writers' lives, people who functioned as social links in this diffuse hamlet society, young followers and devotees and romantics of the field, and so on: an odd genre's fauna. Collectively, they called themselves Science-Fiction Fandom; individually, fans.

Fandom began taking shape in the late twenties, following the proliferation of magazines touched off by Gernsback's pioneering Amazing Stories. It is thus deeply a communications phenomenon. This may account for the sophistication of its communication network, which - like Fandom's structure, its social and professional functioning, and the circus spectrum of its population - had more or less stabilized by the late Forties.

In size, structure, and the general topography of its communications, Fandom closely resembles the "floating colleges" that Derek K. De Solla Price posits as the fundamental intracommunicating intellectual groupings throughout much of science. Price's model particularly describes professional/social groups operating in frontier fields of scientific and technical innovation; so to find it applicable to the generating group of an innovative literature may not be surprising.

Like a floating college, Fandom was a system in dynamic equilibrium, with a relatively high rate of turnover among its thousand or so members. Of these, some 10 per cent were central, being both more densely connected with each other and more prolific and influential. Like a floating college, Fandom's population was relatively mobile (though as a result of personal life-style, rather than of government grants). And like a floating college, Fandom had three levels of communication: personal interchange of visits and letters; local, regional, and national meetings; and published communications.

In this last respect, Fandom differs from Price's model, though in each case publication is the only uniform currency of communication. The publications network of a floating college generally consists of one or several professional journals - e.g., The Worm-Runners' Digest - to which several hundred members contribute more or less actively. The domain of uniform circulation of these journals defines the floating college's territory. Within it an informal mechanism arranges for the individual distribution of reprinted articles (Xeroxes of work-in-progress also circulate, among quite small subgroups).

Fandom's publications' network was much more complex, partly because it was an amateur, second-order system. Fandom had a first-order, centralized system already: the s-f magazines themselves, which are essentially a professional literature, uniformly subscribed to, with no arrangement for reprints. But Fandom publications formed a sophisticated information network not only because they were an auxiliary amateur system free of rigid professional necessities, but also because they serviced the needs of an unusual population.

One index to this is the range of subjects an important fanzine² might deal with - e.g., analyses of the literature, personal memoirs of fanfolk, deviant psychotherapeutic theories, archaeology and mythology, rocket fuels, the history of printing, gun lore, and bad jokes. S-f fans, as a class, had a bewildering array of interests. They were diverse in other respects as well, and as prone to cliques as artists. Their publications systems had to deal with this, and deal also with their urge and need to be bound together by more than professional and intellectual concerns: actively to be a society.

Fanzines, Circa 1955

Against this background, an indigenous medium evolved: the fanzine and its distribution system. In form, the fanzine was mutable. Some were "one-shots" - on a single sheet, tossed off by a beery group for fun one evening, or of many pages, celebrating a person or an event.

Most fanzines were periodical. In a constant flux new ones appeared, to flourish or limp for a few issues and disappear. Some specialized in neophyte literature of the field; others were periodicals of debate. Some represented the interests of an intracommunicating subgroup of Fandom; others, one person's thoughts and writing. Some followed jagged editorial policies; a few set standards of excellence for a decade.

Fanzines had a fairly standard physical form. Most had circulations of between 50 and 200 and were indifferently mimeographed on hand-cranked machines in basements somewhere, or at the office after-hours. Some were jobs of excellent craftsmanship done in hand-set type, or by the Gestetner mimeo, which at the time was the highest-quality cheap mass-reproduction system available for amateur use.

Most "one-shots" were distributed to a specialized extension of some standard mailing list. Some periodicals had their individual lists, and were also sent to anyone requesting them. (Constant and intimate reference to each other among fanzines kept this system of requests functioning fluidly and actively.)

Other periodicals were organized into more elaborate distribution pools - e.g., the Fantasy Amateur Press Association. FAPA had about 120 members, of whom maybe 40 contributed regularly to the quarterly mailings, each of which included say 30 or more fanzines on an ad-hoc basis. Every three months or so your FAPA dues would bring you this thick motley bundle of multipapered fanzines, mailed from some central assembly point (which rotated regularly among various clusters of members in the country).

Faced with maybe a thousand pages of mailing, you would sort out the fanzines you followed regularly and respected, the one-shotters of friends, and whatever else looked interesting. Some references might turn you on to something you missed last round. And you in turn might write in reaction to something in the mailing and distribute it the next mailing in some friendly fanzine or as a one-shotter.

So, by the mutable medium of the fanzine, several thousand people, organized in depth around an open-ended subject field, were joined in a loose active communications system. They were connected, not by a central publication, but by a delicate shifting network of overlapping information spheres. Within this network, the specialized common language of Fandom evolved, without wiping out local dialects, assimilating new components naturally from the network's variegated inputs. Since the network was generated by many autonomous centers, it formed a public free economy, in which standards of taste, relevance and competence were highly individual and competed on an open market. And the decentralized quality of the network also provided the space and freedom for the development of intracommunicating social and intellectual subgroupings.

Refinement of the Model: a Computerized Fanzine

Consider the problem of constructing a useful communication network for the domain of educational innovation, which needs to be defining itself constantly in new directions. The members and groups of this floating college tend to be young, autonomous, and highly individual. Many can tie in to institutional resources and have access to mimeo or Xerox facilities and sometimes mailing funds. They generate a multicentered conversation with strong inputs from diverse sources - computer technology, existential psychology, social action, and so on - that needs to be peculiarly free.

The principles of the fanzine network need only to be married to computer technology to form the basis for a real experiment. Here is the hybrid model in its extreme form; most of its essential features are realizable (somewhat differently) with current technology and budgets.

The system's heart is a big black box that accepts inputs in the form: TYPED MANUSCRIPT + DISTRIBUTION LIST. (They may be punched in directly from peripheral consoles.) Their form is perfectly free. Individuals and groups may publish once, sporadically, regularly. Essays, notes, reports, computer-transmittable pictures, monographs, dinner invitations, recruitments, whole journals with an open variety of editorial policies and functions. There is no central and limiting sense of what is appropriate to the conversation. (It may be expected to become recognizably deformed, personalized and more flexible.)

You - an individual or a group - draw information from the system at your console, or as a print-out mailed to you at convenient intervals by the central computer. What you receive is completely personalized. You have a list of small periodicals you follow and you ask to be sent the work of your friends and some others, whenever it appears. Any inputs on some subjects are to be sent to you automatically; and summaries or notices of inputs on some other subjects. You also receive what friends and strangers choose to send you. But every item you get is marked with a priority - you can set the categories up to your own taste - and so you're free to ignore unsolicited junk.

You are free to select the distribution of what you produce: this is an art, which you can let some editor in the network handle for you. As a receiver of information, you encounter the network as a flexible network or game, at which, as at the game of the Sunday Times, you must develop skill to learn what you need out of what's available. (In this and other respects, the network encourages participation.) Constant cross-referencing to articles, themes and sources will be an important feature of this network - even more than in present floating colleges - and you will have to learn what combination of journals and intellectual gossips is your best guide to the multiplex literature. (The fanzine network generates such specialized guides.)

The central feature of this hybrid system is the freedom it permits and encourages. Needs for information can be defined and satisfied on an individual (rather than mass) basis. Though the conversation has no central government, a common vocabulary of change can still grow, and will: ideas get around, especially in such a rumor-quick system. Unlike the relatively closed conversations that heavily centralized professional journals seem to generate, the structure of this network encourages a conversation quickly open to new components and directions, one that keeps a constant diversity of themes in rolling contact. (Some editors will become specialized channels for new terms without closing off others, filling that niche in the ecology of conversants.) And, perhaps most importantly, the network also facilitates the nucleation and development of subgroups organized on any basis of work, ideas, or friendship.

Is It Practical?

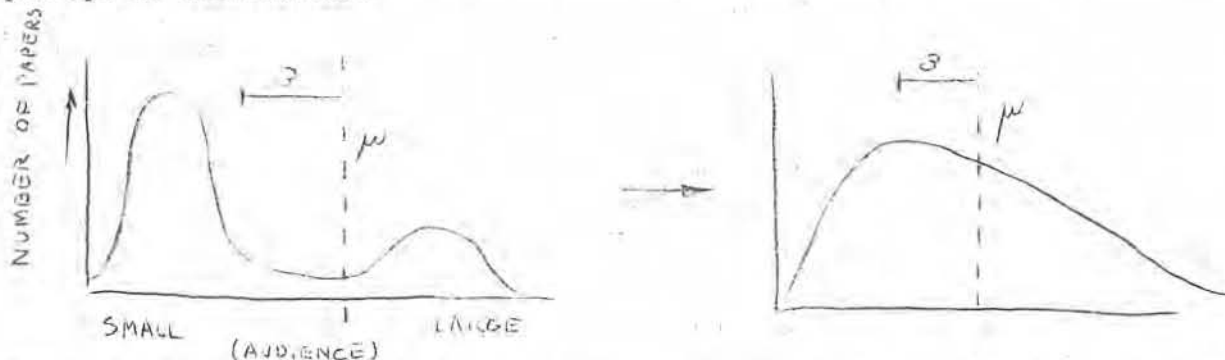
How could a real experiment along these lines begin? Take the several thousand people working at the edge of change in higher education, in programmed instruction, community action, affective education, counseling, sociology of education, video, etc. They already communicate informally and partially, by Xeroxes and reprints through ancillary specialized journals.

They would assess, centralize, rationalize, and extend this present distribution system. Most inputs would be distributed to only several hundred people, and a central facility could compensate for authors who can't take advantage of the growing availability of high-speed Xerox and cheap offset. Distribution assignments and requests could easily be correlated and prioritized by computer, as in the fully computerized network. At worst, individual periodic issues of this diffuse "magazine" could be assembled by hand according to this computer list. Funding for this information network could come in the form of a graduated support-fee.

A Note On Experiment

A group that attempts such an experiment might make a simultaneous self-study of the way the creation and use of this network affects the character of correspondence, both printed and written. Perhaps only an impressionistic account can be had in the way public ideas grow. But hard quantitative data should be obtainable on some aspects of the conversation's change.

For example, the distribution and mean of audience-size for papers should shift, perhaps in this manner:



There should be kindred shifts in the distribution of papers (information) received by individuals, along variables like size, shared audience, recentness, informality, use-resultant cross-referencing, and so on.

All such factors relate intimately to the ease and power with which a massive group can think together. For surely the topology - the connectivity, directionality, etc. - and the technology of the group's communications net largely determine the way ideas are formed and exert their influence. By such quantifiable factors one trace of this kind can be followed.

Notes:

1. D.J. De S. Price, Little Science, Big Science, Columbia University Press, 1963. (See pp. 70-90) Price calls them "invisible colleges", but the term "floating" is more appropriate and already in use in our field. I interpret his model slightly differently than he sets it forth.
2. The "fanzine" from "fan magazine" is the staple unit of publication.
3. Perhaps depending on input/receipt use. See G. Pask and H. von Foerster, "A Predictive Model for Self-Organizing Systems", Cybernetica, Vol III, No. 4 1960. Their models of self-organizing data-interchange systems might aid description of the change process which this network's creation would comprise.

CITIZEN PARTICIPATION AND COMMUNITY CENTERS

by Dr. Donald W. Stotler

There seems little doubt that before the turn of the Century an extensive multi-media communication network will have evolved in America. Such a network could give great benefits or pose great problems. It could evolve in such a way as to decrease or increase direct interaction among people. Will it humanize or dehumanize us? The answer lies in whether we as the users control the network or the network controls us.

The main hope lies in the establishment of a network of community centers throughout the land; a network easily available for people visitation and designed to encourage interaction with various communication networks and other centers. The centers would be attractive and designed to (1) stimulate social action and (2) provide access for involvement, including criticism of the network--feedback for constant readjustment in terms of the user. The centers would offer unity within diversity--that is, unified as to access to common information and diversified in terms of design and emphasis.

- Having lived as a youth in rural villages, I can attest to the effectiveness of community centers as instruments of information exchange and involvement. Everyone in the community knew everyone else and each was in effect under conscious or unconscious surveillance most of the time. It was almost impossible to keep a secret!

People of all ages and kinds attended the meetings at the community center. It was entertaining and educational. The lines between recreation, education and research were refreshingly diffuse. The meetings probed those problems which the people felt needed to be confronted for the common good. Refreshment time was used to digest the meeting as well as the food, and to exchange information about people and events - including plenty of gossip!

This "people mix" approach to information was certainly humanistic, if not always humane. Yet there was such a close feeling within the community that even those least accepted were helped in times of hardship. The greatest rejection was usually reserved for strangers in town or those living in nearby towns, as they were viewed with real suspicion. Communication with strangers was deliberately obscured.

The problem in developing modern day community centers is one of retaining the good points of the good-old-days centers - the "people mix", the involvement aspects - while minimizing the weak points - the undue invasion of privacy and the rejection of other people.

Some ideas about centers to consider as we look to the future:

1. Focus on one neighborhood. Where the old rural center was located conveniently by a neighborhood already acquainted, the modern center often has the task of locating itself accessibly in a neighborhood and then helping it to become a community in spirit and function. Some difficulty may be encountered when getting started in a society where it is often assumed that big institutions are good institutions. A center can succeed, however, in spite of inaccessibility. For instance, the Environmental Education Center in Portland, Oregon, while located on the third floor of an old, unattractive building without an elevator and in an almost impossible parking area, is doing a thriving business.
2. Stimulate but don't take sides. It is quite proper and useful for a center to restrict itself to one point of view regarding the solution to problems.

However, the center that seems most likely to be a community center in terms of people-mix - where the "other" people feel free to participate - is one that helps each participant with his or her own particular problems. In this light a center becomes an idea brokerage house, a catalyst and a source of information, serving to stimulate people to participate in social improvement and help provide access for their efforts. The prime purpose is service to, not management of people. In this way, the staff is less apt to reach bureaucratic proportions.

3. Serve as a magnet. Most buildings in the old communities were austere, so the center didn't need to be especially attractive to compete. The modern community necessarily has many attractions. What it has little of is locations with the warmth of a home-like environment. For this reason it seems important to have carpeting, warm colors, plants, multi-levels and other aesthetic attractions which create an atmosphere for various people-mix functions. This need cost very little if the old barn-raising techniques are used, as will be pointed out later. The center environment should be so planned that the person walking in just feels good. Once in this frame of mind the many attractive options offered can take it from there.
4. Use an un-bureau approach. As Toffler has pointed out, we are moving from a bureaucratic society to one that proceeds by ad-hocracies. Hopefully the day when the park is organized for the convenience of the groundskeeper, the library for the convenience of the librarian and the school for the convenience of educators is about to end. A center might well avoid such bureaucratic trappery as a reception desk at the door, restrictive signs and monitoring activities. Programming the center environment to entice people to make choices on their own, with staff available for consultation when asked is preferable. Some features of the supermarket demonstrate this technique in the commercial world.
5. Unify education, recreation and research. If the spirit of the center is one of comfort, trust, variety, and even joy, the lines do tend to become obscured. For example, a laboratory area may have silhouettes of trees painted on the walls and a tree house to climb into. A study room can be equipped with multi-levels, pillows, aquaria and a library. A games and simulations room may itself be a simulation of a space ship with panel boards which people can manipulate to discover basic life support systems. Dignified? Perhaps not? Workable? Of course! And for people of all ages!
6. Users help maintain the systems. At one center there are self-learning displays that correlate wall maps of the surrounding area with information on rotary card files. In this case they are (1) environmental agencies, (2) school environmental projects, and (3) indoor and outdoor field trips. People feel free while self-learning at these files to correct data on the cards. One can flip through the files and see numerous changes made by the user. There are other ways to involve the user in center change such as graffiti booths where anyone can write anything. A mention should be made at this point about privacy. For example, before community resource helpers are listed it is important (1) to find out each person is willing to participate and (2) to assure that the lists will not be turned over to people who might misuse them - as mailing lists for advertising or the like.
7. Make each center somewhat unique. The old rural centers all looked and functioned about alike. They could, for it was a static world, there being little visitation among centers. It's a different ball game now. People travel often and far. They aren't apt to visit centers like their own. Therefore it seems wise that each center be rather unique so people will drop in to see the difference and thereby make new contacts.
8. Unify centers by electronics. One way to diversify the offerings in a center is

to have it interconnected with other centers by telephone, computer, videotape exchange and cable TV. This makes it possible for the user not only to tap the resources of the immediate community but the evolving world community. It would seem that ultimately there should be a center within about ten minutes travel, wherever a person is. If the system develops along the lines suggested in this article, the evolving world network will tend to arise from numerous grassroots systems. These will begin to intertie as they discover mutual advantages. This approach contrasts with the all too prevalent idea that some grand overall scheme should be devised and then dropped as a net over everyone "for their own good".

9. Build-it-yourself approach. It's a technique as old as the frontier barn-raising where people voluntarily got together to build needed structures. They almost had to use this technique to survive. Unfortunately in our age of specialization, this approach is becoming increasingly rare. It was my good fortune to be in on a barn-raising approach for a museum, a zoo and a center. It was exciting and the process created a clientele of users who felt that those institutions were "theirs". This is a natural approach for developing modern community centers. The process tends to develop the needed sense of community.

As we approach our bi-centennial year why not honor our past by emphasizing the development of community centers and town meetings and our future by pressing toward multi-media networking among these centers which is responsive to the individual?

* * * *

Editor's note: The above paper was written when Dr. Stotler was working with the Environmental Education Center in Portland, Oregon. Reprinted by permission of the author. Dr. Stotler is the author of several books, primarily on science curricula. One book of his which might be of interest to readers is "The Self-Learning Society", published in 1970 by the Northwest Library Association. Now out of print, there are copies available through the Oregon Museum of Science and Industry, 4015 SW Canyon, Portland, OR, 97221.

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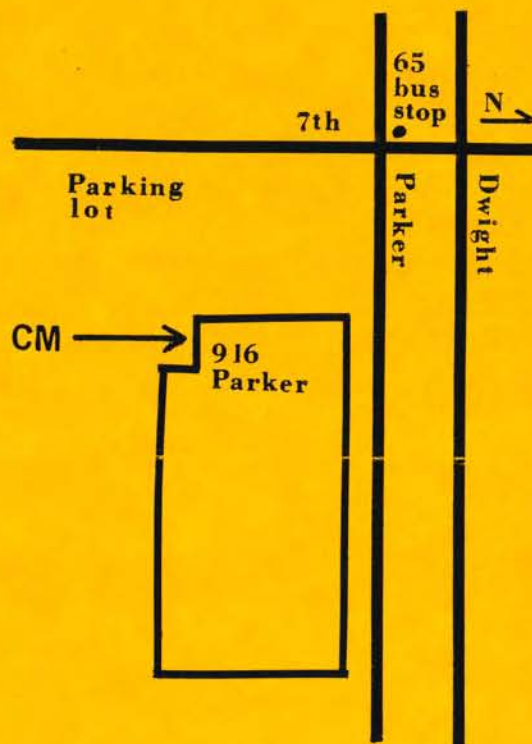
COMMUNITY MEMORY NEEDS YOU!



*Do you want to see more terminals
in Berkeley?*

You can help!

**Come to a
community meeting
and Dessert Potluck
October 9th, 7:30pm
at 916 Parker, 1st Floor
(Phone 841-1114)**



On the agenda
Current status
Short & long term goals
Financing
Improving CM

Two-way public computers link up info seekers

By PAUL LECKY

The radical political messages, the singles looking for company, and the traditional rental and help wanted listings are familiar. But they are not pinned up on cork.

Instead, the listings are being stored in a walk-in computer bulletin board that may make push pins and 3-by-5 cards obsolete.

A Berkeley-based group of computer experts, calling themselves Community Memory Project, has set up terminals at the Co-Op and also at La Peña Cultural Center on Shattuck Avenue in what is billed as the first public-access, two-way information bank in the country. The installation culminates 11 years of work by the non-profit Community Memory Project.

"Our eventual goal is to provide technical expertise and fund-raising support to groups around the country who want to have community memory systems," said Karen Paulsell, a member of the project collective.

Most of the work put into Community Memory has been done by volunteers with some financial support coming from the sale of software developed for the project.

In attempting to raise funds, members of Community Memory often had difficulty explaining the project and decided to get out the terminals with minimal funding in the hope of gathering support through demonstration.

"The important point about this system," according to project co-founder and hardware designer for the Osborne 1 computer, Lee Felsenstein, "is that it gives people the power to make their information public."

Most of the Community Memory users Wednesday morning were spending more time enjoying reading other people's listings on such subjects as restaurants, sex, and politics than in placing traditional bulletin board advertisements.

The system, which has been getting about 50 entries a day, encourages response to previous listings and lively interchanges have already developed in such areas as Dungeons and Dragons, Nicaragua, advertising, and the system itself.

"It's really fun to put in messages and read others' responses," said Aaron Roberts, a second-time user returning to see replies to his message on Nicaragua.

The Berkeley Co-Op is enthusiastic about Community Memory as a new service for its customers, and organizers see expanding it to provide consumer and nutritional information in more detail than currently possible with store displays.

"Community Memory provides services we're already providing, such as the bulletin board and other information services, but does it better," Lisa Van Dusen, director of Co-op Member Services and Marketing, said.

Each of the computer terminals — there is also one at the Community Memory offices and a third public terminal will be installed at Whole Earth Access at Ashby Avenue and Seventh Street within two weeks — is connected to the Community Memory office Plexus computer, which has a memory capacity of approximately 50 million characters.

The memory capacity of the electronic bulletin board is equivalent to eight football fields covered with the 3-by-5 cards used on the conventional bulletin board, according to Felsenstein.

Although Community Memory is currently free, there are plans to install a coin box similar to video arcade games to pay for the system and upkeep.

Felsenstein estimated it will cost approximately 5 cents a minute for the system to pay its way.

A system of 16 terminals would cost around \$50,000 and Community Memory staff hopes the system will be user-owned and supported to give community members the chance to create an electronic resources directory they individually might not be able to afford.

The system will offer access to all and is entirely uncensored, controlled by nothing except what users choose to enter into the data base.

"It's even more democratic than bathroom walls, because it's not even segregated by sex," Paulsell said about Community Memory.

The installation culminates 11 years of spare-time work on the computer system for Felsenstein and co-founder and president of the project Ken Colstad.

The Community Memory Project
916 Parker Street
Berkeley, CA 94710

Efrem Lipkin
1811 Ward St.
Berkeley, CA 94703



Black and Tan Coonhound, American Foxhound

The Community Memory Project

2617 San Pablo Avenue, Berkeley, California 94702 (415) 841-1114

Dear Friends,

We hope that you enjoy this copy of Community Memory News #2. We've recently celebrated our first year of operation, and moved into new office space which provides walk-in access and greater public visibility.

The move was hectic, time consuming, and expensive. But now, we're ready to expand and improve the existing Community Memory network.

We're planning to install two more terminals this fall, bringing the total number of public terminals in Berkeley to five. And we hope to install coinboxes on all our terminals so that our pilot can start to pay some of its own bills.

But in the meantime, we're paying all the costs ourselves. Once again, we could use your financial assistance. The telephone lines for each terminal cost \$37 a month -- and soon we'll be supporting 5 of them. Each new terminal costs over \$1,000 to install.

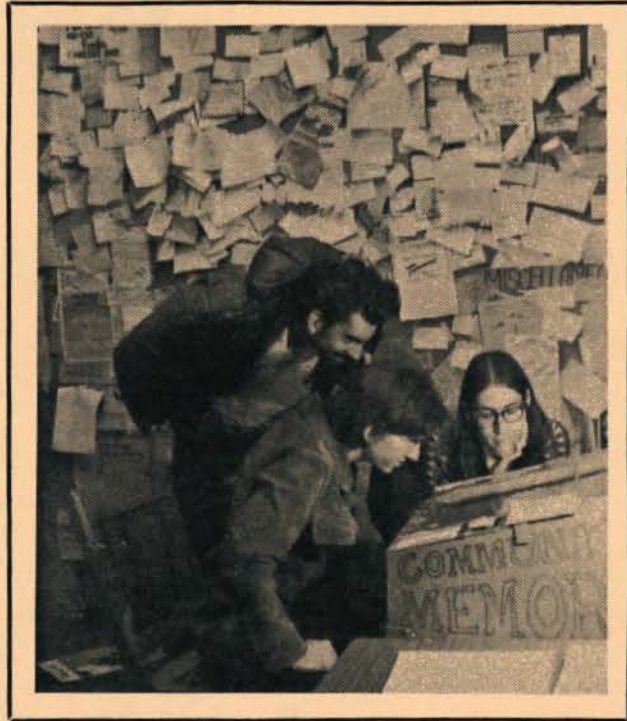
If you want your donation to be tax-deductible, please make your check payable to Village Design.

We want to take this opportunity to thank all of you who contributed during our last fund raising drive. The donations, from \$1.00 to \$1000.00, helped make keep us going during the last year, and helped pay the costs of this newsletter. Your financial help, the time put in by volunteers, and the warm and encouraging letters we've received all contribute to the continued growth of the project.

For a future on our own terms,

The Community Memory Project

The Community Memory Project



an introduction

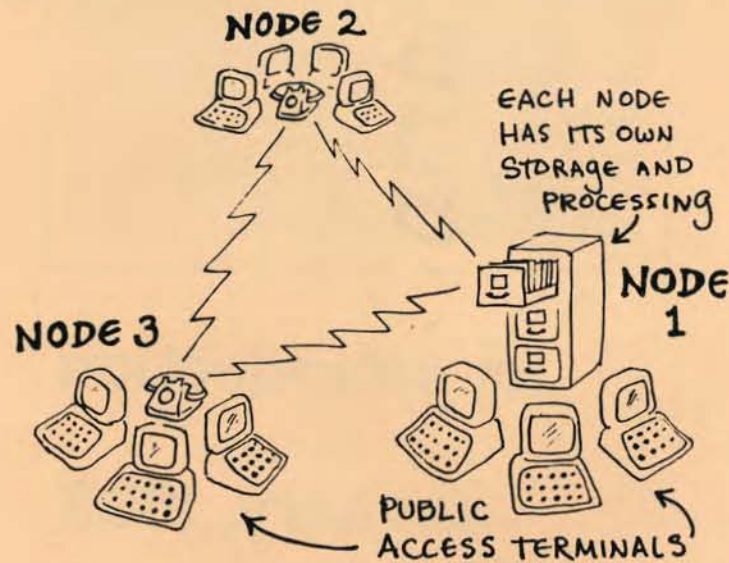
January, 1980

I. What is Community Memory?

Community Memory is a system for the public management of public information. It is an open channel for community communications and information exchange, and a way for people with common interests to find each other. It is a shared community filing cabinet. It is a tool for collective thinking, planning, organizing, fantasizing, and decision-making.

The Community Memory system gives people a place to store and label information, which can then be selected, sorted, and fished out as needed. All the information in the Community Memory is put in directly by the people who use the system: anyone can post messages, read any of the other communications that are there, and add comments or suggestions at any time.

By being open and interactive, Community Memory seeks to present an alternative to broadcast media such as TV. The nightly national TV news -- both commentary and commercials -- gives people the "word" from on high, telling us "that's the way it is." Community Memory is different. It makes room for the exchange of people-to-people information, recognizing and legitimizing the ability of people to decide for themselves what information they want.



The Community Memory system is a network of small computers with large memories, each connected to 10-20 computer terminals. These terminals are for direct public use. People can type in messages with a typewriter-like keyboard and get messages either displayed on a TV screen or printed out on paper.

Each set of terminals around one computer with memory storage is called a "node". In each node, the terminals are all hooked up together and any information in the node can be taken out through any terminal. As the Community Memory network grows, nodes will be interconnected into larger groupings as part of a regional or national network.

The projected incarnation of Community Memory is a broad dispersion of computer terminals in public places, such as community centers, libraries, stores and bus stations. A Community Memory node might also be shared by people who are working on some common project in different parts of the country -- the "community" here would not mean one geographic locality, but would represent a community of common interests.

II. Why Community Memory?

The designers of Community Memory would like to see a world not broken up into nation-states or corporate states, but one built upon many overlapping regions of concern: from household to neighborhood to interest group or work group, from geographical region to globe, where decisions are made by all those affected. This would be a world where power is distributed and governance is the process of collectively trying to determine the best action to be taken, via general discussion and complete dissemination of information. With this vision, the Community Memory system has been designed to be a communications tool for a working democracy.

The purpose of Community Memory is therefore to support the direct and unmediated exchange of information among individuals and groups. The system is designed for communications and collective planning and decision-making, rather than for accounting, statistical analysis, or general office tasks. Community Memory could be used to form libraries, prepare newsletters, and aid the planning, decision-making, and day-to-day work of federations,

cooperatives and collectives. By both supplementing and complementing existing community communications systems, Community Memory has the following advantages:

A. Availability.

Although we have described the system as a shared community filing cabinet, it won't require its own office or continuous attention by staff. We propose to install terminals in, for example, community centers or the offices of community-based organizations which have a high level of drop-in traffic. Other terminal sites might be free clinics, libraries, community food stores, coffee shops or even laundromats. Sites will be selected by people from the community where terminals will be located.

B. Community Control.

In contrast to most information services, Community Memory will have no staff people mediating between "clients" and information. People can enter any message or question they want, and obtain information anonymously and without having to fill out any forms. They can add comments to existing messages, organize conferences, carry on conversations, and make their own connections. These features give the community of users a great deal of control.

C. Appropriate Communications Technology.

As an accessible, non-hierarchical and interactive public medium, Community Memory will be unique among current communications systems. It has certain similarities to pay telephones, public libraries, radio talk shows, and bulletin boards, but it has the potential for being a far more powerful tool than any of these.

The system is also unique among other small computer "information utilities" which are being marketed for home and office. To date, commercial systems which run on a personal computer or hook up to the home TV set seem to perpetuate a one-way flow of information, from "providers" to "consumers". Such systems seem mainly designed for individual use for playing games or receiving the stock market reports, rather than for communications and information exchange. The commercial systems thus do little to overcome people's continued isolation from each other.

D. Interlinking of Communities.

A "community" can be a geographic, economic, cultural, political, or recreational entity. By helping its users connect to others who share their interests and concerns, Community Memory can strengthen people's involvements in many overlapping communities and help them work together toward common goals. When Community Memory nodes become widespread, a user will be able to dip into the memory of a node a thousand miles away (for a small additional fee). This ability to browse far and wide over the system should increase the chance that a user can make a useful connection.

III. The Limitations of Community Memory.

Community Memory is a very useful tool. However, like any tool it can go unused, be misused, or be used too much. A few things should be made clear:

A. There are Other Tools.

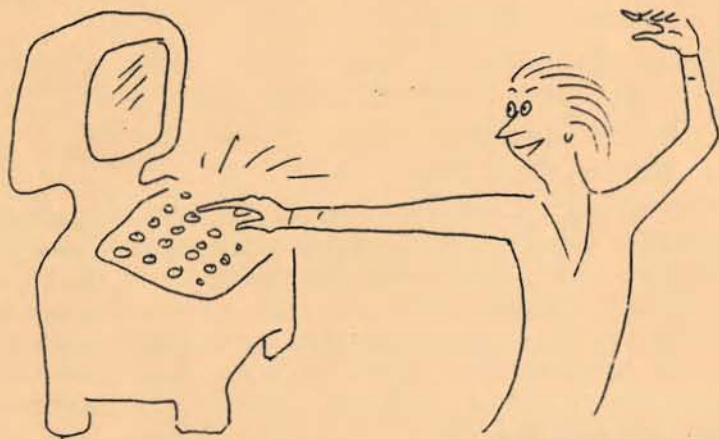
The purpose of Community Memory is to aid in decentralizing control of communications and power relations in general. A ditto machine can be used for the same goals, as can the higher technology of the Xerox machine. Community Memory is an electronic filing cabinet, but often a "mechanical" filing cabinet is more appropriate. Computer technology is very sexy. It sells well, and it can frequently be used for tasks which could not be reasonably accomplished another way, but it is expensive, complex, and hard to make reliable. If something can be done adequately without computers, it *should* be done without computers.

B. The Technological Fix is an Addiction.

Community Memory is a demonstration of the potential of technology to be used for human liberation. However, the existence of a potential does not assure or even make likely its utilization. Like solar energy, radio, etc., the realization of the possibilities must be accomplished in opposition to the current organization of power in the society. The structure of society will not be changed to the disadvantage of those currently holding power by the introduction of *any* new technology or application of technology, although the powerful frequently use technology to their own

advantage. (Prince Peter Kropotkin, 19th century geologist, ecologist, and Russian revolutionary, is quoted as having said that while steam power concentrated production in large factories and caused the demise of the small workshop, the introduction of electricity, which provided easily distributed energy, would reverse the process of concentration. Such mistaken optimism about new technologies is still common.) New technology for managing information and making decisions is a *requirement* for a *humane world*, but it can't replace the political process. Only humans can build a humane world.

IV. How Community Memory Works.



Address the keyboard.

Press any key, and a program in the computer will print out a message with introductory remarks and instructions. The program will then ask you for your next move -- either entering a message, or finding information. The most basic functions this system performs are variations on "enter" and "find". It is designed to record, sort, store, retrieve, and display text messages.

HOW TO ENTER.

Suppose you wanted to enter a message. You would first select the entry function by pressing the "Enter" key. The com-

puter program would respond with instructions, and then "prompt" your response with the request:

"Enter message:"

You would then type in a message, such as:

"I have 15 dozen large brown eggs for sale, at \$.50 per dozen, in flats. Buyer must provide own transportation. Call Mac at 843-0888 any time."

When you have finished this part of the message, you press another key, and you will then be asked to label your message so that you and others can find it again. The program puts out another "prompt" (question asking user for a response), namely, "Labels?"

Then you type in as many labels, or "keywords", as you like, for example:

eggs
eggs for sale
farm produce

And that's it. You can now press a key to finish the transaction and make your message part of the data base. Each message is automatically marked with the date it was put in and the location of the terminal on which it was written. For example, the previous message might automatically receive the labels "Clarkeville" and "11-25-79" indicating that it had been entered on that date at the Clarkeville terminal.

This example of a straightforward "for sale" message is only one possible type of message. Messages can also be personal notes, conference comments, editorials, factual information, or resource lists. For example:

"Looking for someone with experience in building a passive solar room heater on a south window. Call Ellen at 652-0652 after 6 pm."

Labels:
solar
advice wanted
passive solar
solar heating

or)

"Jenny Carson I have your brown leather jacket. Come see me at Garrety's any weekday 9-5. - Sharon. "

Labels:
lost and found
Jenny Carson

or)

"The senior citizens of Clarkeville are organizing for better housing for the elderly. If you are 65 or over and live in the Clarkeville area, give Sarah Johnson a call at 754-7683 or come to a meeting Monday, October 10, at First Presbyterian Church, 4 p.m."

Labels:
senior citizens
housing
organizing

These sample messages are simple, but they are sufficient to illustrate the main purpose of this system: to connect people to each other -- not to attach them to computers. Community Memory computers allow users to find and use local resources and to get more information directly from people who have it. They don't try to be machines that can answer everything. Like all computer systems, this system can only repeat back what has been put into it, but it can collect information from many different messages and bring them together in potentially useful ways.

HOW TO FIND.

This brings us to the other main function, finding. Here again a computer program will ask you a question, such as "Find what?"

If you then type in a request, such as:

FIND "eggs for sale", the program will find all the messages which have "eggs for sale" as one of their labels. The computer might then report: "7 items found. Do you want to see first lines?"

If you answer "yes" the first lines of the items will appear. You can then select the items you would like to see in their entirety.

Labels are extremely important for finding the messages you want. When entering a message, you should select its labels carefully so that others will be able to find it easily. When searching for information, you can sort through messages most efficiently by stringing together the labels that best describe what you are looking for, separating labels with AND, OR or NOT as needed.

In the above example, you could be more selective by using more keywords, like this:

FIND eggs for sale AND price LESS THAN \$.70/dozen AND Clarkeville AND date LATER THAN 10-29-79

Then you'd get listings of eggs being sold at the price you wanted to pay, and available in an area that's convenient for you. By specifying a boundary on the date, you don't have to look at listings you've already checked.



Always read the label.

In another example, if you said:

"FIND solar AND passive AND heating NOT swimming pool heaters", you would come up with the subset of messages that concerned passive solar heating systems (but not swimming pool heaters). If you said "FIND solar OR passive", you'd get all messages labeled solar, and all messages labeled passive, including such things as "passive resistance."

A list of all current keywords will be available both on the system and in printed form, to encourage people to label similar kinds of messages with consistently similar keywords.

WHO'S IN CHARGE HERE?

Rather than dictating how Community Memory should be used, the designers of the system intend that the USERS shall take responsibility for the maintenance and usefulness of the data base. Users will be able to keep the data base viable in several ways. First, the system allows any user to make comments on any message found. These can be editorial comments, criticisms, or suggestions about where else to look for additional information.

For example, to the message "Mr. Ed will speak at the next meeting of the Rank and File Coalition," someone might add the comment, "For an insightful critique of Mr. Ed's position, see the last issue of ABC Newsletter." Or, the buyer of a car that had been advertised on Community Memory could tack on a comment, "Sold", which would be retrieved with the "for sale" message and would have an effect similar to pasting a "sold" sticker over a real estate sign.

Other comments might be more controversial or confusing. A message, "John Green is a great VW mechanic. Cheap too." might attract the comment, "Green doesn't know what he's doing. He forgot to tighten down my oil filter and I lost all my oil. Nearly wrecked my engine." Such an exchange might just represent different points of view. But there'd be no assurance that the message itself wasn't entered by John Green himself -- or the comment by the local VW dealer who doesn't like the competition.

The unrestricted nature of this information exchange system gives it many possibilities and a few problems. Although it can allow for minor spelling mistakes and warn you if a label you attach

has never been used before, the system cannot eliminate duplications, or guarantee the reliability or completeness of information in its messages. In the final analysis, the quality of the information in the data base will depend on the system's users.

Since memory storage is fairly costly, it is probable that messages will automatically "expire" and be removed from the system after a certain number of days or weeks. Even so, outdated messages may sometimes stay on file longer than they should. There may also be some items, such as comprehensive resource lists, which will be kept around more or less permanently and updated as needed.

Usually, no one except the original author of a message can change or delete that message (before its agreed-upon expiration date). However, every set of terminals will have one staff person (the "circuit rider") who is responsible for helping maintain the data base and respond to users' advice. (Previous experiments showed that users will perform many of these functions themselves).

Since users have the ultimate responsibility for the usefulness of the system, the social support structure for this information exchange tool is as important to its function as electricity. The terminals in any node can be grouped in one local area or spread out among a network of people who share some common interest. The users, connected either by geography or area of interest, can decide how best to keep the system running well, with guaranteed open access and a minimum of barriers to efficient and comfortable use.

V. The History of Community Memory

This description of the Community Memory system is based on previous experience -- it's not just wishful thinking.

Between 1973 and 1975, the first incarnation of the Community Memory communications system appeared in the Bay Area. Small computer terminals were put in the lobby of a music store, in a hardware store, and in a branch of the San Francisco Public Library.

Although there was very little advertising other than word of mouth, the terminals were used up to 70% of the time that they were available. In fact, there was usually a line of several people waiting to use the system, which was made available free of charge.

On a good day, about 30 people used each of the terminals. More than 8,000 entries were made over the course of the 14-month trial period.

The system proved to be easy to use even for people who had never seen a computer terminal before. In fact, it was essentially "self-teaching." People learned how to use the system by looking over other people's shoulders or by following a set of simple instructions.

The terminal at Leopold's Records in Berkeley was installed during the August housing crunch, and it became immediately useful in the students' searches, with the rate of success growing with the size of the data base. Musicians looking for other players entered their names and their specialties. Instruments were bought and sold, producers found new opportunities, and groups advertised for gigs. New groups were even assembled on the spot from leads found in the data base, and from people waiting around for their turn to use the terminal.

Similarly, people used it to assemble car pools, organize study groups, find chess partners, and pass on tips on good restaurants. Interesting and unanticipated uses developed: poems, graphics, dialogues among strangers, and political commentary.

Users often entered public interest messages, such as the following:

"The San Francisco Water Department would like to increase rates charged to water users by 17.4% effective 1 July 74 Application for this increase has been filed with the San Francisco Public Utilities Commission and a public hearing will begin at 2:30 p.m. Tuesday 25 June 74 at Room 282 San Francisco City Hall.

Interested persons would do well to appear at the hearing..."

Many others entered queries for information or connections, or general comments and recommendations, such as:

"The Jade Pagoda on University Avenue just above Grove. Real good cheap food. They had a little fire but that just livened things up. Try it!!"

Keywords: food restaurant eat chinese dine dinner chopsticks

/or/

"Would anyone who has made vinegar at home, please call Steve at 929-8507."

As a final example, the question "Where can I get decent bagels in the Bay area (Berkeley!)" gathered the following responses:

1) There is a store called "Bagels" above Key Route St. in Albany
2) The Danish Bakery at University and Shattuck in Berkeley
3) If you call Michael at 845-4550 an ex-bagel baker can teach you how to make good bagels.
4) You can get fresh bagels at the House of Bagels, way out on Geary in SF.

In this dialogue about bagels, Community Memory helped connect one person with a favorite food ... and included an offer to teach the person how to make his own. The data base also included a wealth of messages about community social services, neighborhood organizing, ecology and the environment, education, clubs, causes, and crises.

The experiment showed that the public at large, without prior training, can use an electronic information exchange system to define and meet their own information needs. The expected fear of computers was not much present. Instead, most people said, "It's about time."

The old system ran on expensive, outdated equipment which could not support replication or expansion of the project, and the experiment was terminated in order to write better programs for newer, smaller, cheaper, more powerful machines.

VI. How We Plan to Build It.

The technical goals in the design of Community Memory are: to produce a cheap system; which can be expanded in small increments; which can work even when parts of it are broken; can be relied on not to lose much information when it does break; and when broken can be put back into service by people without a lot of training in electronics. The major components of the system will be cheap enough so that they can be purchased and controlled by community based groups; but can be interlinked with others to serve large populations.

Community Memory will accomplish this by being many levels of network. The smallest unit is the node. A node will normally be supported by three or more of the latest "microcomputers" with at least two of every important component. In case of malfunction, the node should be able to recover itself and be reactivated. If the staff of a node are unable to discover what is wrong themselves, more highly trained technical types at another node will attempt to run the node from their own system and diagnose the trouble. Only on rare occasions will it be necessary for a node and its users to sit around waiting for a repair person. It would be possible to have a small node built of only one of everything (which would save money), but such a node will have to maintain a good understanding with its users.

Neighboring nodes will be connected by phone lines or cable into mutual aid groups. They can share technical personnel and expensive equipment such as tape drives. To the user, all the nodes in a mutual aid group will seem as if they are a single system.

The next level of network is the region. All the mutual aid groups and loner nodes in a region or city would be interconnected over the phone lines in what is called a packet switching network. The connections themselves will be owned and maintained by some association of nodes in the region.

The regions will be interconnected using "Public Data Carriers" to create a national network. Since these lines are owned by corporations (Xerox, Bell Telephone), communicating between regions will be substantially more expensive than communicating within a region. Searching the system nationally is best done by first knowing where to look. This will be aided by the creation of resource guides, bibliographies, and by encouraging nodes to develop special specific subjects.

Like the network, the user software will develop incrementally. The initial pilot system will have facilities for simple keyword and menu assisted searches and basic screen editing. Then, experiments will be done with user participation to develop better means for entering, locating, and maintaining information. Tools will be added to allow the creating of bibliographies and other resource guides to the data base. Means will be provided so that entries can

be uniquely "signed" by their authors, to aid in determining the reliability of the information they contain. A simple language for writing user-interactive programs will be developed, so that people can participate widely in helping shape the system.

Currently, the software is being developed using the "C" language on Digital Equipment Corporation LSI-11s and Intel 8080 microcomputers. The "C" language was chosen to enable us to switch to faster and cheaper hardware as it becomes available without major rewriting of programs. We are using our own multi-cpu operating system called Provos, both for technical reasons and to keep the cost of buying software for a node as low as possible.

The new programs are currently nearing demonstration level, and (if we can find the money), a pilot node of Community Memory will be operating this year.

VII. Who We Are.

The Community Memory Project is a non-profit organization that works and makes decisions collectively. The work of rewriting the computer programs has been going on for several years, and is being carried out largely by volunteer staff and consultants. The core group of 12 includes the three original designers of the first incarnation of Community Memory, who have now worked together for over seven years.



For more information, write:

The Community Memory Project
916 Parker St.
Berkeley, California 94703

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Community Memory News

A publication of The Community Memory Project

Number Two

New CM Network Gets Good Response

The Community Memory system has been up and running on three terminals in our home town of Berkeley, California for nearly a year. It seems to be a hit! Every month, each terminal gets about 600 uses, and over a thousand new messages are added to the database.

We hope that this single three-terminal system is only the beginning. Already, the pilot system is starting to demonstrate Community Memory's potential as a new, democratic communications medium, an enterprise that combines the spirit of the Free Speech Movement with the best of Silicon Valley technology.

New terminals will be added to the Berkeley system as soon as we (or someone else) can afford it. We're also talking with other groups about installing Community Memories in their communities. Eventually, our networking software will link together several Community Memory systems so



included in this issue.)

The Community Memory Project spent 1983 developing a prototype of the system and testing it on as many people as we could

The three Community Memory terminals were — and still are — the first public-access computers that allow users to put their own messages into the system.

that any user can dip into the information pools of all the Community Memories.

Installing the Berkeley Community Memory was the climax of many years of work: the path we took had many long detours. The early part of our history is told in *An Introduction to Community Memory* and in Issue #1 of *Community Memory News*, which was published in 1983. (Both of these are available; see order form

convince to sit down in front of a terminal. We tried it out on visitors to our warehouse office, and on people without prior computer experience that we invited to use the system while we watched over their shoulders. We carted our equipment and our literature to community fairs, to conferences, and to neighborhood meetings. We talked to potential sponsors of a pilot system — groups that would purchase the necessary equipment, host a set of terminals, and manage

the system.

After a year of testing and revision, we had a system that was simple to use, yet powerful enough to enable people to organize and share any kind of information. However, we still had no agreement on where to put the system.

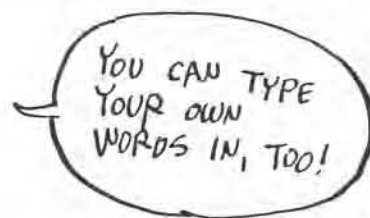
Our biggest problem seemed to be communicating what kind of system we had in mind. Without a concrete example to look at, many people had trouble imagining what such a system would look like and how it would be used. In January 1984, we decided that our best bet was to install a three-terminal demonstration of the Community Memory system in Berkeley, our home base.

We thought we could easily afford to finance the pilot ourselves: although we were (as always) short of funds, we had just concluded a

— continued on next page

software license agreement that would have funded us for a year. Apple Computer Corporation agreed to donate three Soroc terminals. All that remained was to select three Berkeley terminal sites.

We wanted places where the terminals would be in plain view (to attract users and to prevent vandalism); places that had heavy foot traffic from a variety of people and where the hosts were interested in the Community Memory experiment. After visits to about a dozen prospective sites and much negotiation, we found three sites that met our criteria: the Telegraph Avenue Co-op, part of a chain of cooperatively owned supermarkets; La Pena Cultural Center, a restaurant and community meeting place; and the Whole Earth Access Store, a



Drawing by Larry Gonick

As if this weren't enough to keep us busy, we became involved with "The Electronic Cafe," an art project timed to coincide with the 1984 Olympics that connected several Los Angeles restaurants into a video and computer network.

The schedule was tight. The final modifications to the terminals, for example, were finished ten minutes before the grand-opening party.

Unfortunately on the day of the party we also learned that our software license agreement had fallen apart. That meant our prospective income would be well below the bare minimum. At the very least, Community Memory would grow much more slowly than we'd planned. Despite this, we determined that somehow we'd come up

with the effort and money to get the system installed and to keep it going. The same financial situation — and the same commitment — continue to this day.

In addition to that bad news, we had a great deal of difficulty convincing the phone company that we wanted only a very simple connection between each of our three local terminals and the host computer. Since we deliberately sited the three terminals within easy reach of one phone company business office, we didn't want or need conditioned lines or even a dial tone. It took several weeks, several crews of installers, and several tries before all the terminals were hooked with the simple "twisted pair" that we requested.

The first terminal finally went on line at La Pena cultural center on July 17, 1984. Several phone problems later, we installed the Co-op terminal in early August and

the Whole Earth terminal in September.

The three Community Memory terminals were — and still are — the first public-access computers that allow users to put their own messages into the system. All of the major Bay Area newspapers, several national publications, and several radio stations covered our debut.

After the first few hectic weeks in which our public found problems and we made repairs, the system itself settled down and started running well. It quickly gained an enthusiastic following at each of the terminal sites.

Many of the problems we'd anticipated never materialized. People were able to use the system without supervision, and there has been no vandalism whatsoever.

The Community Memory is now filled with about 3000 messages, ranging from ads to jokes to poetry to politics to nonsense. As might be expected from a system in which messages are not edited or censored, there is something of interest or offend almost everyone.

One of the major ongoing complaints about Community Memory is the number of garbage messages it contains. Interestingly, the database is changing in character as the system matures. We are noticing longer and more substantive messages replacing the "visible CB radio" chatter that we saw at first. More users are taking advantage of the author and password features, which lets them edit their own messages at a later date.

We've had three open community meetings about the system,

— continued on p. 7

Community Memory News is a publication of The Community Memory Project. Issue Number Two was produced by Terre Beynart, Marcy Darnovsky, Sandy Emerson, Carl Farrington, Lee Felsenstein, and Karen Paulsell. Feel free to contact us with your comments and questions at: 916 Parker St. Berkeley, CA 94710. (415) 841-1114.

The Free Speech Policy

On March 8, 1984, we sent a memorandum to one of our potential host sites that explains our policy of not editing or censoring messages in the database, except when someone makes a complaint about a specific message stating that the message is causing personal harm or harassment. In practice, we've had to remove only four messages in ten months of operation.

This "free speech policy" has always been controversial, giving rise to concerns about good taste, legality, expediency, efficiency, and other aspects of the operation of Community Memory. Excerpts from our collective response are included here.

We would like to respond to your concerns about the appearance of racist, sexist, commercial, and unwanted messages on the Community Memory computer bulletin board. While we certainly share your concerns about possible abuses of the system, we feel that allowing representatives of the Community Memory Project or anyone else to remove "inappropriate" messages is not the best solution.

We have worked hard to develop Community Memory, and have lived for years with dreams about its use as an open channel for community discussion and organizing. The issues you raise are ones that we've considered carefully, and we'd like to share our thoughts about them.

The practical argument

First, we believe that there won't be enough unwanted messages to create a problem. During a public test of a much earlier version of the system, in 1974 and 1975, very few such messages appeared. We intend to provide an atmosphere around each Community Memory terminal that

encourages uses we support. We will "seed" the database with messages about community activities and resources, public and political events, skills sharing, and similar topics. Off-line, we will prepare literature and posters that explain our hopes for the system.

The political arguments

The Community Memory system provides a way for any user to respond to any message. A user may attach a comment to a message, and subsequent readers of the original message will be informed of the the existence of the comment.

Debate and exchange will certainly provide a much better political education for the users of Community Memory than would sweeping problem messages under the rug.

The ability to comment on messages means that Community Memory can be a forum for discussing issues like racism and sexism. Debate and exchange will certainly provide a much better political education for the users of Community Memory than would sweeping problem messages under the rug. In fact, instigating the open exchange of ideas and opinions is one of the *raison d'être* of the Community Memory system.

The technology on which Community Memory is based is relatively new, although commercial systems that use the same technology are currently being planned and field-tested. The developers of these commercial "information utilities" will make no provisions for the public interest unless they are forced to do so. We would like Community Memory to serve as an example of the democratizing potential of the new technology. If it is to be exemplary it must take care not to set a precedent for controlling the contents of such systems.

The constitutional argument

The suggestion to establish a reviewer who decides what is appropriate for the Community Memory and what is not raises First Amendment issues of free speech and censorship. Aside from the importance of upholding these principles, it is dangerous for progressives to set precedents that smack of constraining free speech. Once we bend the principle ourselves, we are in a much weaker position when censorship is proposed from other political quarters.

The legal and regulatory issues raised by computer information utilities are as yet unresolved.

We have posted notices on each terminal that state:

PLEASE READ BEFORE USING COMMUNITY MEMORY

Community Memory is an unmediated communications system. All user messages go directly into the system, and are available immediately to all other users.

Messages are not reviewed or screened in any way.

Each message in the Community Memory represents solely the opinion of its author. Neither the Community Memory Project nor the sponsors of individual terminals can make any attempt to verify the accuracy or appropriateness of the information or statements in these messages.

You use and view Community Memory at your own risk. We offer users the opportunity to comment on messages which they think are inaccurate or incorrect. Like messages, comments are not reviewed or screened.

Co-Op Store Surveys Community Memory Users

Last fall, Community Memory and the management of the Telegraph Avenue Co-op supermarket (a Community Memory terminal site) obtained feedback from Community Memory users with a short questionnaire developed by the Co-op Education Department. The following is an outline of the results.

Questionnaires were placed next to the terminal and voluntarily filled out by a variety of CM users. There were questions about age, sex, income and amount of previous computer experience. Other questions concerned use of CM: how often, when, and where. In addition, the survey asked what kind of information the user would like to get from (or put into) Community Memory.

A total of 60 people responded. Most of the people who

People are mainly interested in using the CM system as an electronic bulletin board (78%). In addition, 66% wanted to see the system as a forum for community information, 27% would like to use it as a clearinghouse for consumer and nutritional information and 8% wanted to see news about the Co-op.

The Telegraph Avenue Co-op terminal is part of a three terminal pilot Community Memory System. Currently there is no charge to use the system, but there are plans to attach a coinbox to each terminal. Users would be charged an access fee (for example, 25 cents for 5 minutes). Proceeds from the coinbox would help pay phone bills and maintenance costs. Because of this, one question asked how people's use of Community Memory would change if the coinbox were



New users check out the Co-Op terminal

Photo by Karen Paulsell

"My 7 year old daughter has had fun teaching people who were struggling to use it. So have I. I love to see it here."

filled out the questionnaire were 25-44 years old. 37% were women and 63% were men. The largest proportion of respondents made less than \$10,000/year (34%); 25% were in the \$10-20,000 bracket. Of the people surveyed, 17% had never used a computer before, 55% used one occasionally and 8% used one often.

When asked about how much they used Community Memory, 32% said they had used it over 4 times, 23% had used it a couple of times and 30% had only used it once. 11% of the people surveyed had never used CM at all, but they filled out the survey anyway. 71% have, at one point or another, been unable to use Community Memory because it was either not working or already being used by someone else. Most people use the system in the evening (31%).

installed. The question was: HOW WOULD YOUR USE OF COMMUNITY MEMORY CHANGE IF COMMUNITY MEMORY COST 25 CENTS FOR 5 MINUTES?

- USE IT A LITTLE LESS
- USE IT A LOT LESS
- WOULDN'T USE IT AT ALL

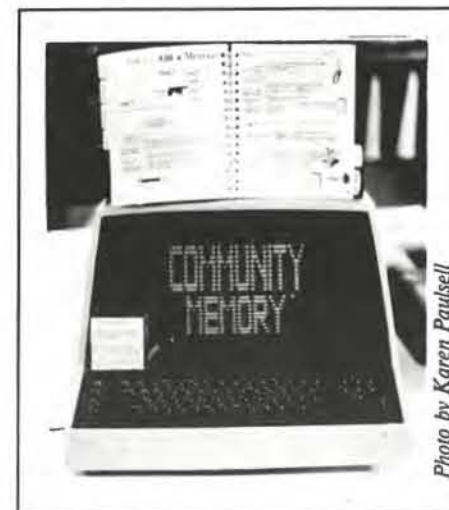


Photo by Karen Paulsell

Of the 60 people surveyed, 5% wrote in that they wouldn't use it any less. (That category was inadvertently missing from the list of choices). 26% said they would use CM a little less, 15% said they would use the system a lot less and 32% said they wouldn't use the system at all.

One of the last questions (which inspired the most varied responses) was "What word best describes Community Memory?" According to the respondents, the words that best describe

Community Memory are: fascinating, instructive, relevant, outdated, great, fantastic, tedious, tacky, inefficient, needed, interesting, cluttered, useful, useless, friendly, unfriendly, fun, boring, helpful, needing more locations, cumbersome, novelty, ok, wonderful, progressive, original, great potential, intrepid, keen, slow, neat, exciting, expressive, over-structured, valuable. As you can see, perceptions varied quite a bit.

Stories about using the Community Memory system were solicited at the end of the survey. The

following quotes were taken directly from the surveys:

"I was considering a decision and couldn't make up my mind. I threw out the question on Community Memory and have had several responses. It's a fantastic feeling to read a response to your message!"

"My 7-year-old daughter has had fun teaching people who were struggling to use it. So have I. I love to see it here."

"I located an old acquaintance through this once. (Fancy meeting you here!)"

"Input not controlled. It's full of obscenities. Too bad. Technojunk."

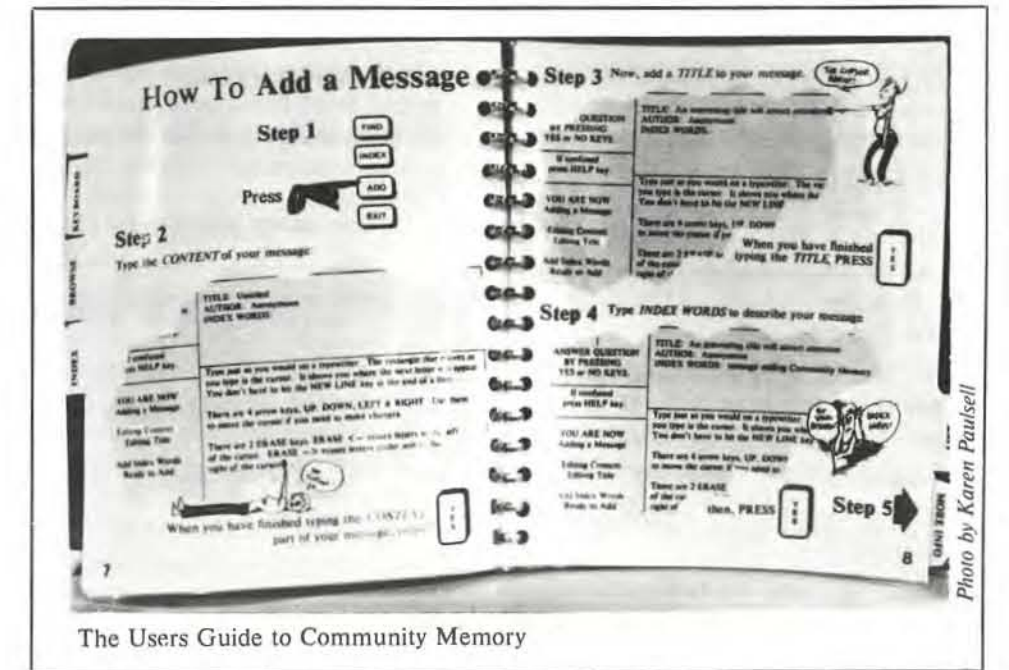
"Time to use it is more important to me than money to use it."

"The few real messages are interesting; the incredible number of stupid messages make its use (browsing at any rate) quite irritating. Perhaps once people get over the thrill of being able to swear and talk about sex in public that will change."

"It has been most interesting observing the system grow and seeing how individuals discover new communication patterns."

Because only people at the Telegraph Avenue Co-op were surveyed and because the sample is so small (60 people), this survey is not representative of all of the Berkeley Community Memory users. However, it's interesting to find out what sort of people are using the system and what their perceptions are. It is also instructive to find out what people are using it for and what they would like to see it become.

This survey was taken three months after the terminal had been installed, so we can assume that the views uncovered are the initial reactions to the idea (within this particular community). A follow-up survey might uncover a move away from the perception of the system as merely an electronic bulletin board. At the time of this writing, we have noticed that many people are also using the system for dialogues, discussions and announcements of events and community services.



The Users Guide to Community Memory

Photo by Karen Paulsell

Becoming Self-Supporting

We're planning to start charging for using the Community Memory terminals at some future date. The fee most often mentioned is 25 cents, the same price as the cheaper video games.

Here are the results of some computations we've done to answer the question "How many quarters would it take for a Community Memory system to be self-financing?" Before we lead you through the calculations, we'll ease the suspense by saying: 51 quarters per day, per terminal will pay for a 16-terminal Community Memory system, one and one-half staff people, phones, maintenance, and insurance.

To arrive at "51 quarters per day," you need to divide the total startup costs shown in Table 1 by 60 months (5 years) to arrive at a monthly pay-off of \$893. Adding the ongoing monthly costs from Table 2, that's \$5038 a month in expenses. That sounds steep...but the cost per terminal is only \$314 per month (\$5038 / 16 terminals).

We figured that some places would be open 7 days a week, and

Table 1: Start up Costs for a 16-Terminal Community Memory

The node computer	\$30,000	Maybe as low as \$15,000, or as high as \$50,000, depending on the particular machine, memory, number of ports, etc.
Terminals	10,400	16 terminals at \$650 each
Modems	9,600	16 pairs at \$600/pair
Furniture	2,000	Tables (and perhaps chairs) for each site
Phone installation	1,600	Average of \$100/site
Total Startup	\$53,600	

others only 5; we compromised with a figure of 25 days per month. Dividing \$314 per month by 25 days, we arrive at \$12.56 per terminal per day, or 51 quarters (and 6 more cents).

We use the figure "5 minutes for a quarter" as our ballpark figure when describing our charging scheme; if we use this as the rate, each terminal would need to be fed quarters for 51 5-minute sessions, a total of 4 hours and 15 minutes per day.

Even though we don't have coinboxes attached to our terminals

in Berkeley yet, we find these numbers encouraging. With just 3 terminals (and two of them at locations that are open only 6 or 8 hours a day), the terminals average more than 4 hours of use on the busiest days.

These calculations are still in the "back of the envelope" stage. We may have under- or over-estimated some costs. We haven't done a recent computer price survey, but we believe that computer prices will continue to go down. The biggest expense over time is actually the salaries; this might be reduced with more volunteer effort, or might be higher if there aren't as many volunteers.

One aspect of the model that's very interesting when you play with it on a spreadsheet is its dependence on the number of terminals. Adding a few more terminals increases the original investment slightly, but substantially reduces the number of uses required per terminal, since the cost of the computer and the fixed monthly costs are spread over a larger number of users.

After we have installed coinboxes on our three pilot terminals, we'll be able to get a more accurate estimate of how many quarters it really takes to keep a Community Memory system alive and well.

Table 2: Monthly Costs of System Operation

Personnel	\$2,750	1 1/2 full-time equivalents at \$20,000/year
Phone lines	720	\$45 per site
Rent	200	A space for the computer, and the 1-1/2 workers
Computer maintenance	175	Cost of our current maintenance contract
Additional maintenance and repair	100	Terminals & modems
Insurance	100	For the computer and terminals
Phone, supplies, postage, etc.	200	Costs of maintaining the office
Total Monthly Costs	\$4,145	

Starting a Community Memory

The Community Memory Project is now ready — and eager — to help other groups start their own Community Memory systems. We'll provide the software and support, including operating instructions, installation procedures, other literature, signs, and training. The operators of the system — a local group or coalition — will be responsible for providing the hardware, arranging for the terminal sites, and running the system.

We'll ask each group to sign a formal license agreement with the Community Memory Project. The license agreement includes a set of operating principles and practices for the Community Memory system. We're working on a draft of this agreement. We'd like to hear your feedback on these basic principles:

Public Access:

All terminals at which the CM software and/or database is available for use will be accessible to the general public during the entire time that the host site is open to the public.

Free Speech:

Messages entered at the terminals will be immediately available to users: there won't be any prior review process.

Messages in the CM database may not be modified by the system operator except:

Expired messages can be deleted.

New CM Network Gets Good Response

— continued from p. 2

all of which were well attended and provided us with lots of ideas and a couple of valuable new volunteers. As part of an ongoing fundraising campaign, we've hired a professional fundraiser and continue to submit grant applications to various foundations and agencies. We've

If a person submits a complaint that a particular message is causing harm or problems, and that person unambiguously identifies the message, then that message may be removed by the system operator.

Non-profit Operation:

The system will be operated on a not-for-profit basis. If fees are charged for using the terminals, they must be low enough to be considered nominal. Any revenue realized from these fees must be used to cover the capital and operating expenses.

We want to take the investment we've made — the years we've spent developing the Community Memory software and concept — and with a minimum set of "rules" encourage politically progressive community-based information structures.

Information in the database cannot be used except through the public Community Memory terminals. In particular, the information cannot be sold or transferred to other databases.

Community Accountability:

The system operator will demonstrate sensitivity to the needs of the community, and have some public accountability. (This could be in the form of community meetings and/or publicly available minutes and records.)

Connection to the Network:

When the network is available to interconnect Community Memory nodes, the system operator agrees to link the local node to the network.

System operators will assist other groups in setting up Community Memory systems by providing information and technical assistance whenever possible.

Our Escape Hatch:

The Community Memory Project can review the performance of system operators, and rescind the agreement if they aren't meet-

ing the spirit and terms of the agreement. The Community Memory Project will give a system operator at least 6 weeks' notice before a review.

One of our objectives is to encourage innovation and diversity in the applications of Community Memory. We want to take the investment we've made — the years we've spent developing the Community Memory software and concept — and with a minimum set of "rules" encourage politically progressive community-based information structures.

taken steps toward forming the first Community Memory Association. The Association will assume ownership and control of the Berkeley system, with the active participation of more of the Co-op grocery stores as a likely prospect.

This year, we hope to add more terminals to the Berkeley sys-

tem, and to attach coin boxes and printers to the terminals that are already installed. We have learned a great deal about the power and limitations of our system by doing this pilot. We plan to make the system even easier to use and better at helping users find just the messages they want. As always, we need your help.

Bulletin Board Battle

We want to give people a way of communicating with each other that doesn't rely on mass media.



The Community Memory Project
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CREATING A COMPUTER COMMUNITY

Berkeley's Community Memory
tries to make computer accessible
to people who don't own one

The system will offer access to all
and is entirely uncensored, controlled
by nothing except what users choose
to enter into the data base.

Two-way public computers
link up info seekers

"The important point about this
system is that it gives people the power
to make their information public."