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EXPERIMENTAL DEVELOPMENT OF A SMALL COMPUTER-AUGMENTED INFORMATION SYSTEM

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Abstract

During the third year, the emphasis was on provision of prototype information services. Online catalogs and directories were made available to users at network sites around the country. Provision was made to allow users to write and execute text-analysis programs. A Query system was designed that allows novice users to gain quick access to highly structured data bases. An index-like file with user-tutorial features was created for reader access to online files at NIC. Two online publications, a newsletter and a professional journal, were inaugurated. In addition, some background studies were made of the features desirable for research information services.

INTRODUCTION 1

ONR Research Contract N0014-70-C-0302 is a project to develop a small computer-augmented information system designed to serve the intelligence needs of a research and/or development community. The project, called RINS (Research INtelligence System), ended its third year of development on 14 April 1973. 1a

The RINS system is being developed within SRI's Augmentation Research Center (ARC) that pursues a continuing, closely coordinated set of objectives year after year (3906,) (5140,) (8618,) (10045,). Since the beginning of its augmentation system development in 1963, ARC has evolved a sizable set of integrated tools and techniques to support the process of computer-system development, especially the development of systems for increasing the effectiveness of organizations doing complex knowledge work. The experimental prototype system whose development and use serves as ARC's laboratory is a system for augmenting an organization of knowledge workers who specialize in the development of complex information systems. The staff of ARC make extensive use of the experimental system in their everyday work. 1b

For ARC, RINS is an important project in a long-term activity in which all components are being continuously developed. The RINS project is unique and valuable to ARC because in it ARC strives to produce an operating intelligence system to provide its own system developers with the information they need. Based on the ARC community's experience, a system is evolving to provide a larger community of system developers with the information they need to understand their outside world. It is ARC's plan to expand steadily the number of R&D groups among systems developers that interact and collaborate to their mutual advantage through computer network and online sevices, and to begin to enlist groups that are developing customer-oriented systems in difficult knowledge-work areas. 1c

For the Office of Naval Research, RINS is an investment in the development of a system to aid knowledge workers such as those engaged in ONR-sponsored research to perform their personal work with information and to work with teams, mostly geographically separate, using the computer tools developed in RINS. The tools are designed to increase productivity of researchers, research teams, and others, by allowing them to use a system for handling information, both informal and formal, about their area of work. This should help increase communication among people working on similar problems, stimulating their thinking and reducing unintentional duplication of effort. 1d

RELATIONSHIP OF RINS TO THE KNOWLEDGE WORKSHOP 2

In the total effort to augment the knowledge workshop, many modules are contributed by the RINS effort. However, in giving a summary of progress, the RINS-supported efforts are so fully integrated in the whole ARC activity that there can be confusion in identifying the extent of work attributable directly to RINS. To place RINS-supported efforts in perspective with RINS aims and the entire ARC effort, they may be cast in the following outline, with references to sections of this report.

2a

RINS-Supported Efforts	Section
Intelligence System Studies	
System Developer's Needs	3c2a
Information Services	3c3a
People Support Operations Procedures	3c3b
Intelligence Collection	
NIC and ARC Reference Selection	3c4a
RINS Literature Searches	3c4b
Intelligence Processing	
Individual Use of Tools	3c2b
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Intelligence Storage	
Online Files and Their Updates	4b
Intelligence Retrieval	
Query Language	4a
LOCATOR Design	4c
Thesaurus Study	3c4c
Intelligence Dissemination	
Announcement Bulletins	4d
Design of Online Journals, ARPANET NEWS and SIGART NEWS	4e 4f

2b

SUMMARY OF RINS ACTIVITY 3

ARC proposed the following tasks for its third year of development: 3a

(1) Adding to and modifying computer aids that will be used to support RINS processes. 3a1

(2) Continued integration of RINS data base and tools into the working life of ARC researchers and selected Network users. 3a2

(3) Continued development of augmented management and operations techniques for running the research intelligence process. 3a3

(4) Adding to its developing research intelligence data base over a limited subject domain. 3a4

In each of these general tasks a substantial degree of progress was achieved. As in previous years, and in conformance to our "bootstrapping" strategy, the particular timely needs of the ARC and its network communities suggested the specific areas in which development took place. In the first year of RINS project activity, the emphasis was on the development of information-handling tools, preparatory to offering them to a user community (8616,). These tools included: special catalog files with structure and syntax conventions; special computer processes for analyzing, collecting, sorting, and formatting the information extracted from the files; and methods for producing hardcopy listings and indexes. During the second year the greatest RINS effort went toward the development of management systems for acquiring, coding, storing, and manipulating information. The second year saw the development of the Catalog, with programs for indexes. It also saw procedures developed for the unconventional clerical operations that were needed for the development of an online information center (10045,) 3b

During this third year the emphasis was on provision of prototype online information services. In a following section the particular information services provided are described. First, a report on activity in the four general task areas is given here. 3c

(1) Adding to and modifying computer aids that will be used to support RINS processes. 3c1

Catalog Support System 3c1a

The Catalog Production Processor underwent further development, refinement, and use in the current year. As described in the previous year's report (10045,), the processor is being designed to allow the production of

online and offline, and incremental and cumulative, indices and lists of various kinds, using the Master Catalog data base (14537,)

Three editions of the Current Catalog of the NIC Collection, as well as numerous revisions of the Directory of Network Personnel, were run using the CPP.

Following the year's experience with the growing Master Catalog and the use of the Catalog Production processor, a reevaluation of the entire catalog production design is under way. The limitations of the present computer system for handling the expanding Catalog files have caused ARC to start a study of alternative means for catalog production (15078,)

Closed Circuit TV for Meetings 3c1b

The recent acquisition of a camera and projector for closed circuit TV has offered a new potential for RINS activity. The new equipment has been found useful for demonstrations to large groups, and for small ARC meetings. A file can be constructed containing the agenda and can be projected for information and to form an outline for recording the transactions. During the meeting, facts presented and conclusions reached may be input and edited to record the discussion and reflect the opinions of the attendees. This was found to be a very satisfactory means of focusing on the questions to be handled and of recording concensus in a realtime mode that allows for immediate verification or correction (13579,)

Shared Screen 3c1c

A highly useful tool for RINS dialogue was regained (it had been developed for the previous computer) in the shared screen capability. A user at a display can view the same text simultaneously with another user across the country and can share the operations to be performed on files thus seen. This capability is a tremendous step forward in the stimulation of collaborative creation and use of research intelligence.

(2) Continued integration of the data base and tools into work of knowledge workers. 3c2

RINS Study of System Developers' Needs 3c2a

During the year, the RINS effort was responsible for several preliminary studies of needs of the community and means of satisfying them (10806,) (11331,) and (16737,). (Report 16737 appears as Appendix A).

Application of Tools to One Worker's Information Needs 3c2b

During the year, the Hardware Director of ARC's Computer Service Operations made extensive use of the ARC text-handling tools to keep his records. He created files of information and indexes to his records, into which he could immediately record new information and from which he could immediately obtain references and retrieve the information recorded. He designed the files to suit his needs, using the NLS features for both entry and retrieval and the Query Language for an alternate means of retrieval.

The design and extent of the use of ARC tools by this knowledge-worker can be briefly indicated by the copies of some of his files that are included as Appendix H.

Application of Tools to Work of a Group, at NSRDC 3c2c

In its network activity, ARC has succeeded in having its tools used by various groups. Of particular interest to ONR might be the experience of Naval Ship Research and Development Center in using the text preparation capabilities offered at ARC.

Two NSRDC people who had become aware of NLS text-editing capabilities made a rush request for user documentation to enable them to train a staff and have the staff prepare an important report within a two-week period. The hardcopy documentation was slow to reach them, but in the meantime the staff plunged ahead. ARC members who noticed the heavy weekend activity of the NSRDC users on the ARC system assisted the NSRDC staff by online tutoring. The production of the report exemplified the usefulness of ARC-developed RINS tools in the work of a geographically distant community of researchers.

ARC User-Prepared Programs 3c2d

Several ARC members who are not programmers adapted NLS program features to produce high-level user programs for preparation of indexes and bibliographies, preparing formatted letters, and the like (14603,) (12119,).

(3) Continued development of augmented management and operations techniques for running research intelligence processes. 3c3

Study of Information Services 3c3a

ARC has made a preliminary review of other operating bibliographic systems and has formulated a set of questions to guide further work on this project.

Visits were made to several sites to learn about and to use information handling systems in operation at these sites. ARC internal documents (11779,) and (10806,) were prepared as RINS efforts.

Design of People Support Operations Procedures 3c3b

ARC has continued to improve working procedures for handling acquisition and input of RINS information items. Some RINS conventions have been established for integration of the ARC Journal and for gathering intelligence information.

Procedures designed for the People Support Operations (13037,) are directed at meeting the needs of RINS in these areas. They include secretarial, clerical, documentation, and library type operations. ARC Journal indexing programs are designed to facilitate retrieval from online files of messages as well as retrieval of citations. These efforts are mainly RINS supported, with benefit to all ARC projects.

(4) Data base development. 3c 4

Using the coding manual and procedures developed earlier, and refining them as practical, an ARC cataloger coded, abstracted, and entered into the online data base about 600 documents of all types. (10937,) (10923,). About 400 citations were added as a result solely of RINS activity. 3c4a

Literature searches, at hourly cost, were performed by SRI library personnel on RINS-related subjects of man-machine interface, management information systems, and computer network systems, yielding about 1000 items. From these, valuable items are being selected, acquired and cataloged. These items were selected solely on the basis of RINS interest. 3c4b

Work was started on analysis of the vocabulary that had been used in the supplying of subject terms (keywords) by agencies that produce or distribute formal reports cataloged at ARC, and of the vocabulary that had been used at ARC in assigning subject terms to documents for later retrieval. ARC has been inserting the subject terms into the online record of a document exactly as the terms were recorded in the document or as they occurred to the ARC Cataloger. Now that the data base is of significant size, it is time to study the vocabulary used, to start to set up for these terms an authority file with cross-references. An authority file of subject terms is the tool that allows a person assigning subject terms to an item to refer to previous assignment practices. This reference to previous practice gives consistency to subject term assignment and in turn allows a person to retrieve items on a subject with some consistency. 3c4c

ONLINE INFORMATION SERVICES 4

Query Language 4a

ARC had been aware for some time of the place in a Research Intelligence System for a simple but powerful retrieval language, one that would allow a novice user to gain quick access to highly structured data bases without his being required to know the structure. The International Conference on Computer Communications (ICCC) in Washington in October 1972, attended by many foreign computer scientists, offered an incentive to the development of such a system designed for access by teletype. 4a1

Query Language at ICCC 4a2

At the ICCC users with no experience with the ARC text-handling system NLS were given access to highly structured files prepared in NLS and were led by instructions to retrieve specific paragraphs of information. The data base was of interest to the users because it contained the Network Resource Notebook, wtH OUTLINE DESCRIPTIONS OF Sites on the Network. 4a2a

NIC/Query in 1973 4a3

A second version of Query has been released with the following features: 4a3a

i) Any person logging into SRI-ARC can enter the system by typing NIC and a carriage return. A simple response gives him directions and options.

ii) It enables users to load any NLS file through the "bring" command.

iii) The Network Resource Notebook, consisting of a number of files of information on resources available on the Network, can be "brought" into view by typing the letter R, the ARPANET NEWS can be brought by the letter A, and so forth. A directory of less-frequently used files can be accessed by typing the letter D. The directory gives further instructions in using the data bases.

iv) When the user is in need of further instructions in the use of the language, he can type a question mark to obtain a complete description of commands.

v) Whenever a file is "brought", a jump is executed to the first statement in that file. Here a data base administrator can place instructions to the user to lead him in use of the file.

vi) A template is always given to the user so that he is aware of the structure below the present level. However, any statement more than one level down from a named statement is invisible to online users. This allows the masking of long textual information.

NIC/Query for ARPANET NEWS 4a4

The Query language is ideal for Network users to access the current issue of the online periodical ARPANET NEWS without needing to know the issue's date or having knowledge of any user language. A description of the NEWS and its access in Query, in NLS, and in hardcopy is given in a later section. 4a4a

NIC Online Files 4b

The files of reference citations and of membership in various groups have long been accessible online but until recently the online versions were identical to the hardcopy that was generally available. 4b1

It is not now, and is not likely to be, feasible to issue hardcopy of a directory or index every time a change is made to the file. The advantage of online files is that they may be kept current, by the day or hour if desirable. 4b1a

In the last few months the goal was achieved of keeping lists of documents issued in series by groups (for example the Speech Understanding Research Group) current with the latest issuance. 4b2

Group membership lists also are now kept up-to-date for online reference. 4b3

LOCATOR 4c

To simplify reader access to the many useful online files now generated at ARC, an index-like file was created that contains links to many files, allowing easy scanning of the files available and quick loading of the files selected. This file, called LOCATOR, requires use of NLS and rewards the users with great maneuverability in the files accessed. It has many user-tutorial features. 4c1

Announcement Bulletin 4d

Two issues of an Announcement Bulletin of new documents cataloged at the NIC were prepared and distributed in hard copy to 150 Network members and associates. These bulletins were issued on a monthly schedule starting in February 1973. The text for these bulletins is prepared by programs used to produce the document catalogs. Each bulletin is actually a number listing, with abstracts, of formal documents of Network interest held in the collection at ARC. 4d1

The response to the issuance of this Bulletin has been a stream of requests for the documents listed. These requests are frequently sent online. 4d2

ARPANET NEWS 4e

Among the tools clearly needed by a knowledge-working community is an online publication medium that serves as the computer-augmented counterpart of the traditional professional journal. 4e1

This year, under RINS activity, two experimental online publications were designed. These were developed independently, one for ACM SIGART group and the other for the ARPANET. Each was tailored for its expected readership and had its particular editorial philosophy. 4e2

Although inaugurated to reach the ARPANET community, the ARPANET NEWS was designed as a prototype for an online news service for any research community. It is still in the process of development, and may continue so for some time, as the mode of operation suggests further capabilities not foreseen. At the present time, the ARPANET NEWS has these characteristics: 4e3

(1) Online Editorial Direction 4e3a

The joint editors, at MITRE and at ARC, communicate frequently, and almost entirely, through Network Send Message, through online links, and through the NIC Journal.

(2) Online Manuscript Submission 4e3b

All material submitted for publication is received online, in NLS or in TECO.

(3) Online Editing 4e3c

All editing is performed with NLS text manipulation.

(4) Online Publication 4e3d

Each monthly issue takes shape at NIC in a public file, that is easily loaded and read by anyone on the network. Many people do look at it in this form, as evidenced by comments and corrections received before the issue has been announced as published.

The issue is prepared in two forms: one file for access by Query language and one file for access from NLS for consecutive printout on a teletype or lineprinter. (See Appendices C and D).

Through the Query language, the reader can turn to a particular section (the feature articles for example) by a one-letter and a three-letter command, and browse through the headlines until he sees something of interest. He can then retrieve the item by statement name.

Through NLS, the reader sees a version formatted slightly differently, that he can browse through, but that is intended for printing out by main section or in its entirety. An announced file contains the cover and masthead, for those who want to print the complete NEWS on a lineprinter for reproduction and large-scale distribution.

Online updates are inserted in separate sections as the news is received, and this news is incorporated in the next issue.

SIGART NEWS 4f

The SIGART News of the ACM Special Interest Group on Artificial Intelligence was a successful, highly regarded hardcopy journal that its editor wished to augment by online preparation and production. ARC volunteered the online storage space, the tutoring to show the editor what could be produced, and the experienced staff to input the text in a form that would produce a reasonably attractive printout master for publication by ACM. 4f1

An unusual feature designed for this publication is the capability to attach comments to existing articles, so that online readers can learn what additions, corrections, and so on, that other readers have made. This is accomplished by a program that accepts a comment sent by an online correspondent, formats it and places it at the end of the actual article. Further plans for the publication include the encouragement of online submission, online access, and comments. 4f2

SUMMARY OF INVESTIGATION PLANNED FOR COMING YEAR 5

In moving toward the building of a Research Intelligence System, ARC will concentrate during the coming period on two specific subobjectives: 5a

Primary Subobjective 5a1

Development and study of conventions to enable individuals and working teams to input, modify, and retrieve items of research intelligence using a system involving people and computer support, particularly ARC's Journal system and catalog management system. Sources of these items will include: visit reports, conversation records, working notes, clippings, correspondence, books and papers, and marginal comments. An important part of this objective is the training and study of users so as to create a system adapted to their and the project's day-to-day work needs. 5a1a

The effectiveness of the input and retrieval features of the experimental ARC systems, as used by ARC and other system developers, will be studied.

An associated study of known user-controlled file systems will be made, to compare their features with those developed for RINS.

Related Subobjective 5a2

The design of an integrated interface to publicly available data bases of interest to system developers: abstracting publications and services, information clearing houses, information center data bases, and research libraries. 5a2a

Means will be explored of integrating the intelligence records created by individuals and teams with the resources of large institutional data bases. One goal is to integrate into the intelligence system a methodology for effective utilization of outside sources of information; no research group wanting to use a RINS can afford to duplicate research work of others. Another goal is to allow the user to draw on the bibliographic or data entry work of others to eliminate repetitive effort in entering intelligence references to a data base.

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Appendices

Appendix A: ARC 16737, Jeanne B. North. "A Status Report on RINS Design Considerations" Augmentation Research Center, Stanford Research Institute, Menlo Park, California, April 1973.

Appendix B: ARC 11841, J. F. Vallee. "Q1: A Simple Retrieval Tool for TNLs Structured Files" Augmentation Research Center, Stanford Research Institute, Menlo Park, California, 19 Sept 1972

Appendix C: ARPANET NEWS via the Query Language

Appendix D: ARPANET NEWS via TTY

Appendix E: ARPANET NEWS in Hardcopy

Appendix F: SIGART NEWSLETTER Instructions

Appendix G: SIGART NEWSLETTER in Hardcopy

Appendix H: CSO Indexes

Appendix A:

ARC 16737. Jeanne B. North. "A Status Report on RINS Design Considerations" Augmentation Research Center, Stanford Research Institute, Menlo Park, California. April 1973.

An outline of information system design considerations, showing areas of activity related to each, and giving an analysis of the strengths and weaknesses in specific areas.

INTRODUCTION 1

The RINS effort is "development work on a small, computer-augmented information system oriented toward serving the 'intelligence' needs of a research (and/or) development community." (Journal,8278,2a). ".?.in it ARC strives to produce an operating intelligence system to provide an active community of system developers with the information they need to understand about their outside world." (Journal,8278,2c). 1a

The project specifically works toward progress in four areas (as stated in proposals SRI ISU 71-15, January 25, 1971 and SRI ISU 72-197, December 26, 1972): 1b

Develop a solid, prototypical research-intelligence data base over a limited subject domain in an early test case. 1b1

Add to or modify the computer aids, developed under ARPA sponsorship, that will be used to support RINS processes. 1b2

Integrate the data base and tools of RINS into the working life of ARC researchers and other communities of users. 1b3

Develop augmented management and operations for running the research-intelligence process. 1b4

What follows is a viewspec-oriented analysis of the steps in a total intelligence system, and areas of present strength and weakness at ARC. 1c

Top level statements are steps in a system. 1d

Second level statements are areas of activity related to these steps. 1e

Subordinate numbered statements are specific aspects and examples. 1f

Lowest level statements are comments on: 1g

(S) strengths of ARC
(W) weaknesses of ARC in relation to these specific examples. 1g1

OUTLINE OF ANALYSIS 2

To merit the term "system" a group of processes should combine to form an orderly working totality. A number of information-processing capabilities developed in areas of accidental interest will not necessarily form a system. The truism that one cannot automate a system until the system can be run manually is applicable, but more importantly, a system cannot be said to be augmented until a true system exists. 2a

(I) Dynamic, aggressive, means of intelligence collection 2b

(II) Capture of intelligence collected 2c

(III) Processing of intelligence for initial dissemination 2d

(IV) Means of dissemination to groups and individuals 2e

(V) Processing of intelligence for reference and retrieval 2f

(VI) Means of retrieval 2g

ANALYSIS 3

(I) Intelligence collection 4

Much intelligence can be gathered passively. Among the passive means: 4a

Papers by and from close friends 4a1

S - DCE is a prominent figure in information science and receives many valuable works from author friends 4a1a

Papers from colleagues who habitually record and distribute 4a2

S - AC is an established address which is on many distribution lists 4a2a

Reports received thru exchange agreements 4a3

W - ARC prepares few reports or papers, is in a weak position to attract exchange 4a3a

News spread by correspondence and phone in the invisible college 4a4

S - DCE and other ARC people are members of relevant invisible colleges and have friends who could keep them apprised. 4a4a

W - ARC members are not prompt active correspondents who elicit more information. 4a4b

S - DCE and some other ARC members converse by phone. 4a4c

News from visitors to site 4a5

S - ARC has many informed visitors. 4a5a

S - Recently a log form has been used by DCE and others to record information received from vistors in a form from which it can be retrieved by subject analysis. 4a5b

An adequate body of intelligence, either for a group or an individual, cannot be built passively. Developments of non-friendly rivals and of groups with low publication budgets, with low travel budgets, or general low profile, will be missed. Dynamic means of collection include: 4b

Subscription to and examination of relevant periodicals 4b1

W - Less than a dozen of the periodicals subscribed to by ARC are of research caliber. ARC receives twenty or more controlled circulation and promotional magazines of slight value. 4b1a

Regular examination of announcement and abstract bulletins 4b2

S - For the past year ARC subscribed to the Government Reports Announcement Bulletin, the official source of information on government-funded work. 4b2a

S - For 3 months, ARC contracted with the SRI Library for retrospective search and suggestion of reports 1965-1971, and for clerical work entailed in checking ARC holdings, and in ordering those approved by ARC. 4b2b

W - Cost for this service and lack of precise knowledge of ARC needs on the part of the Library staff makes it inadvisable to buy this assistance. Only one ARC member has been willing to give time to examine the GRA to select publications. 4b2c

Acquisition and examination of lists of publications of other research groups 4b3

W - ARC has no active program of acquisition of such lists. 4b3a

W - Only one member is interested in examining. 4b3b

Visits to other sites 4b4

S - DCE, by virtue of membership on NAS panel on Information Science Technology, visited several information technology sites in 1971. No further visits of any importance have been made. 4b4a

S - NIC personnel have made a few visits to ARPANET sites. 4b4b

ARC systems information, folklore 4b5

S - This information is not hoarded, and is willingly shared informally. 4b5a

W - Not all users are in the right place at the right time, and do not get the message. 4b5b

W - Manuals are slow to be written, and do not have links to folklore documents when these are issued. 4b5c

(II) Capture of intelligence collected 5

Conventional means of capture of intelligence should be used until an innovative means is designed and in prototype: 5a

Papers received by ARC members should be channeled through a login process 5a1

S - DCE often wishes to acquire a serial number to use as a link, and relinquishes papers long enough to accomplish this 5a1a

W - Others usually do not submit material for recording, possibly because they see little benefit to them. 5a1b

W - Logging alone, without capability to retain a copy in a secure collection, does not constitute capture. Often the logged article cannot be retrieved physically. 5a1c

Substantive ARC-related correspondence should be channeled through a login process. 5a2

S - Some of DCE's correspondence receives serial numbers. 5a2a

S - NIC related correspondence passing through the Station is copied if necessary and filed. 5a2b

W - NO correspondence received log is maintained, for DCE or others. 5a2c

S - Procedure is written to establish online correspondence log, ready for implementation. 5a2d

Reports and books should receive initial capture processing at the time of receipt if they come unsolicited, or at the time of order if they are ordered. 5a3

S - procedures are written and have been implemented for report and book processing beginning with the order request. This work is assigned to one person and runs smoothly. 5a3a

Reports of telephone conversations, of conversations at other sites and of information-bearing conversations with visitors to ARC should be collected. 5a4

S - A few of these have been tape-recorded, and the equipment is available. 5a4a

W - Recorded conversations are too lengthy, often low in new information content, and often remain untranscribed, and if transcribed, unread, and if read, unindexed. 5a4b

S - Logs by individuals have been kept recently. 5a4c

W - We could benefit Network users by providing a message recording phone to receive lengthy messages as dictation, in order to have the full text base. 5a4d

Creation of machine-readable documents, in an interactive system or in deferred execution mode, should be practiced. 5a5

S - Display system editing is an augmented system. 5a5a

S - DEX (Deferred EXecution, an ARC-designed method of batch machine input) is intended to offer advantages over other offline text editors. 5a5b

W - Keyboard input is not the natural or preferred method of intelligence recording for many people. 5a5c

New periodical issues should be examined for relevant articles and news. 5a6

S - Procedures exist for this, and some articles are now captured, from the few valuable periodicals received at ARC. 5a6a

W - Only a few journals are examined; no consistent effort is supported to cover ARC's interests. 5a6b

Capture of a reference should not be equated with capture of full text. 5a7

S - Tagging a reference to a publication, by an online citation, for later pursuit is an important capability. 5a7a

W - Inserting an online link which leads to a reference which is in fact only a footnote and does not represent presence of the document is a fallacious link. 5a7b

Augmented means of capture should be devised; capture is one of the greatest lacks in research intelligence flow. 5b

New means of recording and condensing oral information could be pursued. 5b1

W - ARC does not investigate speech compression or other means. 5b1a

Other modes of record than textual and oral could be followed. 5b2

S - ARC now uses a video camera experimentally. 5b2a

W - Training aids in photograph and movie form are not now being used. 5b2b

Copy of published, TTY terminal, manuscript or display text directly to microfiche for storage and all later uses could be considered. 5b3

W - No one at ARC is purposefully following such developments by others. 5b3a

Capture of full documents at ARC usually entails rekeyboarding. 5b4

W - Errors can be, and almost invariably are, introduced in rekeyboarding. The subsequent document cannot be regarded as identical. 5b4a

(III) Processing of intelligence for initial dissemination 6

Initial dissemination, as distinguished from retrieval dissemination, can be treated as serving three functions: giving notices which have time value, disseminating information ostensibly new to a general or specified audience, providing selective dissemination to recipients through a receiver-initiated filter process. Processing the intelligence for these purposes now entails the following: 6a

Meeting announcements, agenda and directions, and transient information such as system status and Network status require quick, accurate processing, including ARC-wide as well as outside dissemination. 6a1

S - We can now provide one-day input-to-output service on hardcopy announcements and such news. 6a1a

W - Journal hardcopy processing takes from 4 hours to several days. 6a1b

Basic documents prepared online and made available online and in hardcopy need occasional updating. Procedures have been worked out to make machine processed editing changes and replacements. 6a2

S - Changes to the online copies are noted in signatures and by changes in number and date. 6a2a

S - Changes to hardcopy are well documented and status reports allow checks on contents. 6a2b

Text with accompanying non-text information should be kept intact for bulk delivery 6a3

S - We can use the Journal system, when it is operating, to hold online and hardcopy information in form for general or specific delivery, such as to Group members 6a3a

W - We cannot keep nontextual material with the textual. 6a3b

Initial processing should eventually be augmented by these capabilities: 6b

Input should be immediately accepted and subsequently available. 6b1

W - We do not have a means for processing transient information, such as the state of nodes on the Network, for automatic or demand dissemination. 6b1a

File should exactly duplicate input. 6b2

W - Facsimile transmission can achieve this; present keyboarding does not allow this. 6b2a

Information should be so tagged upon input that it can be matched with output specifications set by the recipient. 6b3

S - Citations to documents are now being coded by subject to allow matching for retrieval at a later time. 6b3a

S - Online documents and citations can be coded for a specified subcollection, to drop into a retrieval pocket, a facility now used only in a gross way. 6b3b

W - No mechanism is available to watch for key terms to switch messages to user file. 6b3c

(IV) Means of dissemination to groups and individuals 7

An essential activity of the ARPA Network has been dissemination of documents to sites and individuals. ARC has adopted some conventional means and developed some new means. 7a

Hardcopy document distribution in envelopes and bags 7a1

S - Mails well 7a1a

S - Printed material received from others needs no recasting 7a1b

W - Expensive of materials, time, and labor 7a1c

W - Allows error in transmission of material to proper addressee 7a1d

Hardcopy in folded computer printout 7a2

S - Impressive 7a2a

S - Automatic addressing 7a2b

W - Flimsy; mail room warns probably gets torn or lost 7a2c

W - Allows error in transmission to addressee 7a2d

W - For bulk mailing, more expensive than reproduction 7a2e

Development of online directory of recipients 7a3

W - Still unreliable, often unavailable for changes 7a3a

W - For hardcopy dissemination offers no improvement over addressograph 7a3b

Online message and file distribution 7a4

S - When reliable, will allow a means of dissemination system-related to other terminal activities. 7a4a

S - Allows a chain of related dialog to be established, with contributors able to specify relations 7a4b

W - Until online storage capacity is greater, chain is not complete and no improvement over a manual correspondence filing system. 7a4c

Some unconventional but experimental means could be pursued for comparison with the means ARC is using. Incentives for such pursuit are present limitations on speeds and media for present transmission. 7b

Facsimile transmission 7b1

W - Not yet high quality for photographs 7b1a

W - Expensive 7b1b

S - Fast 7b1c

S - More versatile than text-only transmission 7b1d

Picturephone with videorecorder 7b2

S - Total message transmission 7b2a

S - Realtime interaction 7b2b

W - Not yet available to ARC, but only to some other ARPA sites 7b2c

Telesessions 7b3

S - Realtime interaction 7b3a

S - Relative economy 7b3b

Microfiche of documents 7b4

S - Well-established techniques 7b4a

S - Inexpensive for existing fiche documents 7b4b

S - Low storage and use costs 7b4c

W - Expensive production in small quantities 7b4d

(V) Processing of intelligence for reference and retrieval 8

Retrieval requires tagging and storing items of information so that any item, alone or in combination with others, may be called back when it is useful, whether or not its specific identity is known before retrieval. It is important to successful processing to respect the law that no more can be retrieved than was input in processing, a variation of the law of garbage in, garbage out. 8a

Tagging. Capture of an item can be accomplished as described in Section III by a logging operation. However, logging allows retrieval by one entry point alone, serially (date or number). Adding tags to various elements of the item, such as author, recipient (for letters), and such other items as physical form for books and films allows retrieval by any of these points. 8b

An extensive list of codes has been devised at ARC for tagging the elements of information in all types and forms of items received. 8b1

S - This list of codes and the accompanying procedures were worked out on the basis of long experience in information retrieval. The codes have been extended, and sometimes modified, to take care of the many possibilities encountered or expected. 8b1a

W - This list of codes is too complicated for use by persons other than catalogers, and no subset of the codes has yet been identified for use by an individual researcher for his own files, with instructions which will allow an individual to avoid the pitfalls of most individually-maintained files. 8b1b

No authority list has been developed for standardizing the forms of corporate names or of keywords. 8b2

S - No existing authority list was appropriate for the corporate name mix in the ARC files; a tailored list can be formed when the ARC files become large enough to be representative of the collection to be expected. 8b2a

S - No existing keyword list or thesaurus was appropriate for the collection; a tailored list is to be compiled from machine-manipulated keywords entered by the catalogers. 8b2b

W - Retrieval will be incomplete to the extent that variations and inconsistencies in names or subject words are not allowed for by the human searcher. 8b2c

Storing. For machine retrieval, the cataloging information including all the tagged items must be in machine-readable form. This usually means on cards or tape. 8c

At ARC, all catalog files are online or on tape. 8c1

S - Online files are easily modified and updated, with changes which are inherently necessary in catalog files as items are added, superceded, and sometimes deleted. 8c1a

W - Storage space requires that about 80% of the catalog files be on tape, which is retrievable in a few minutes, but updates and modifications to these files must be batched, and online space must be arranged to allow the offline files to be brought online for these changes. 8c1b

An arrangement of articulated files as contrasted to serial files, with construction for table lookup of corporate addresses, could allow a greater number of items to be stored online at one time. 8c2

W - Presently, the input procedures require the entry of corporate addresses for each item as cataloged, and thus the repetitive storing of the same information for many items. 8c2a

(VI) Means of retrieval 9

Retrieval is dependent initially on the capture, tagging and storing of items. Then programs written for retrieval must be based on the rules established for input format. Online retrieval is expensive of computer time and of storage space, and should be compared in efficiency with alternative offline means for retrieval. 9a

Online retrieval of files 9b

Files created online and stored online can be retrieved by a command to load such a file, or by a link placed in another file which acts to load the linked file on command to link to it. 9b1

S - The capability to place and to retrieve by means of links is a powerful one. 9b1a

W - Many links refer to files which have been removed to tape, and cannot be accessed immediately. For reading, an offline copy may be adequate, and faster. 9b1b

Online retrieval of citations 9c

Online retrieval is possible at this time from indexes to document catalogs. 9c1

S - This is an important capability and has a great potential. 9c1a

W - At this time, the citation files are in a format for reproduction, which makes them wrap around on the TTY or the display, and detracts from their readability. 9c1b

W - Lack of capability to keep the indexes updated by new machine runs results in online versions of files being no more uptodate than hardcopy produced and distributed, and removing any advantage to most online files for retrieval. Exceptions are a few files which are updated by keying input. 9c1c

Online retrieval of items of information 9d

Content searches of full text are possible in an online file. 9d1

S - Ability to do this is advantageous in editing, in long text files, and in index files when searching for words not used as index terms. 9d1a

W - This capability cannot be used when the system is heavily loaded. 9d1b

Items of information about individuals can be retrieved from online files of personnel information. 9d2

S - Retrieval of certain items of data about an individual from an online file by giving his last name or machine ident is very useful. 9d2a

S - Retrieval of a mailing list or of addresses of individuals on a machine-generated index list is an important capability. 9d2b

W - No mechanism presently exits for automatic updating of the index files; either the files are no more uptodate than their printed versions or they must be updated by keyed input. 9d2c

Offline retrieval from machine-generated index files 9e

Programs written at ARC for retrieval have been written in conjunction with the codes and their interpretation by catalogers, with numerous iterations to achieve a match of input and output. 9e1

S - Catalog listings and indexes presently produced are very useful. 9e1a

W - Additional programs are needed to produce indexes to other elements presently coded into the online files. For example, no programs have yet been written to produce indexes by contract number, or by keyword. Present programs for author index need revision to format author's first names. 9e1b

Offline retrieval from manual files 9f

Offline files are maintained at ARC for all items of information for which online files are built. These offline files include files of correspondence, documents, author card files, 9f1

S - Offline files of correspondence and other complete documents act to reduce the bulk of information which otherwise would be required online. Offline files of documents which are journalized and stored on tape make reference to these documents as easy as accessing them online, where the offline files are at hand. 9f1a

W - In an ideal system, online access would continue to retrieval of the final product, without exception. 9f1b

W - Maintenance of offline files of author cards is duplication of effort, and maintenance of offline files of cards by coporate agency, by title and by subject, duplicating the online indexes, would not be a feasible activity. 9f1c

Appendix B:

ARC 11841. J. F. Vallee. "Q1: A Simple Retrieval Tool for TNLS Structured Files" Augmentation Research Center, Stanford Research Institute, Menlo Park, California. 19 Sept 1972.

Describes the prototype Query system, a system that allows a novice user to create and access a personal file system.

JFV 19-SEP-72 15:18 11841

Q1: A Simple Retrieval Tool for TNLS Structured Files.

This describes a prototype that is available for testing. It can be used for accessing personal files as well as the NIC Resources Notebook. It will be integrated in NLS within a couple of weeks. To use th prototype in the mean time, do the following:

get <rel-nls>xnls
ddt
tnls /alt mode/g
then proceed as shown in the example.

Q1: A SIMPLE RETRIEVAL TOOL FOR TNLS STRUCTURED FILES 1

Definition 2

NLS provides a sophisticated file structure that can be used in simplifying many documentation problems. It is natural to put that structure to work in the operation of a "personnalized file system" that can be driven from a teletype. 2a

Q1 is an experiment in TNLS-based retrieval that allows people to create such a simple personal file system without requiring tailored software development and maintenance. 2b

Principle 3

The scheme upon which Q1 operates is straightforward: instead of parsing and recognizing some set of commands, translating them and searching for the relevant record, Q1 relies on the NLS structure mechanism for this task; it treats as a statement name whatever input string the user passes, and executes a jump to that branch in the NLS file upon which it operates. It checks that the branch in fact exists, and provides error recovery if it does not. It responds by printing out the next level of that branch. That level may in turn be either a list of statement names (that can again be interrogated) or a text. 3a

Illustration 4

A simple interrogation session is given below as an example. It uses the Resource Notebook as the basic file: 4a

*[g]*oto *[q]*uery CA 4a1

level? *[1]* CR
File name? *[*<NIC>NETINFO*]* CR 4a2

Type ? if you need help at any point.

-
*[s]*how *[*sites*]* CR 4a3

(sites)
(TIPS)
(users)
(servers) 4a3a

Q1: A Simple Retrieval Tool for TNLS Structured Files.

-
*[s]*how *[servers]* CR 4a4

(servers)
(UCLA-NMC)
(SRI-ARC) 4a4a

-
*[s]*how *[UCLA-NMC:Interests]* CR 4a5

(Interests)
UCLA-NMC has varied interests in ,... 4a5a

*[*to will stop printing at any point*]* 4a6

-*[q]*uit

* (continue in NLS) 4a7

4a8

Note that the user types a carriage return to send a command (except after ? and quit), but CA (command accept) is also recognized. 4b

Accessing several files 5

The *[b]*ring command allows you to open and interrogate the contents of another file during a Q1 session. 5a

If the file is not locatable the system will type: 5b

File does not exist
or not available to Q1 5b1

The user will then have a chance to retype his command. 5c

Applications 6

Q1 was designed to test an inexpensive retrieval tool that could be used with minimum training in the TNLS environment. It places users in a position not only to define their own information file but their own command structure as well. They can do that without having to maintain special software: changes in statement names (that can be made directly on the data file itself) are transparent to Q1. Also, Q1 will work on ANY FILE where statements are adequately named. 6a

The first application will be to the on-line query of network

resources. A file of our own hardware information is also being implemented. 6b

How to use Q1 7

In order to use Q1 efficiently you must be reasonably consistent in the way you name the branches in your file. Often you will have a list of items, such as the network sites above, that you wish to catalog. Each site has a name and under that name is a structure which repeats in all site records: hardware, personnel, capabilities, etc. The naming convention is your own and should be based on this structure. 7a

Your file should have a HELP branch whose name will be (h). The first thing Q1 does is to instruct users to type a question mark for assistance. This question mark gets translated into the h character and the corresponding branch is treated as any other branch: in particular it could have structure so that help information could be given at several levels. 7b

The Help branch should give users adequate knowledge of the naming conventions. Here again, the contents of the file are transparent to the software; you can change old commands and introduce new ones: the system will do the right thing as long as you're consistent. 7c

You can designate a sub-branch under any named branch by the convention: 7d

```
XYZ:ABC
```
7d1

which takes you to the first occurrence of the name (ABC) within the branch (XYZ) at any depth. 7d2

The Q1 prompt is a hyphen. 7e

You can return to NLS by typing "quit". 7f

On-line Help and recovery 8

Q1 is different from other NLS subsystems in that users need on-line help at two levels: i) what commands are available and ii)how a particular file is structured. 8a

Help of the first kind is obtained by typing a question mark (without carriage return) which triggers a message provided within Q1 itself. Help at the file level is obtained by using the SHOW command: 8b

*[s]*how ? 8b1

Which triggers typing of the (h) branch in that file. 8c

Q1 is designed to recover from two kinds of failures: 8d

i) On a command such as 8e

*[s]*how xyz 8e1

or *[s]*how xyz:abc 8e2

it may happen that xyz is not a statement name in that file. Q1 will then intercept the NLS error mechanism and type: 8f

not found
Invalid command 8f1

ii) On a command such as 8g

*[s]*how xyz:abc 8g1

it may happen that xyz is in the file but abc does not exist as a branch under it (or no instance of it is present at that particullar point). Q1 will then respond: 8h

Invalid sub-branch 8h1

In both cases the user will stay within Q1 and will have an opportunity to re-type his command. 8i

--- 8i1

Appendix C:

ARPANET NEWS via the Query Language

Text of the NEWS file prepared for reading through Query Language. To the reader, The text appears as a topic statement and a succeeding article of one or more paragraphs. Topic statements may be addressed by typing one key word.

<NIC-WORK>ARPANEWS.NLS;75, 11-APR-73 10:15 JBN ;
(n1) ARPANET NEWS April 1973 Issue 2 NIC 15337

Choose one by typing:
(for example) s/how/ n7 CR (to display RESOURCE NEWS)
(or) s/how/ u1 CR (to display first update)
To print statement numbers, type v/:type View specs:/mG CR

(n2) ARPANET NEWS Information About the Publication

Issue 2 April 1973
Hardcopy issue published monthly
Online updates available weekly
Distributed by: ARPA Network Information Center
Stanford Research Institute
Menlo Park, California 94025
Editors: Jeanne B. North (NIC)
Jean Iseli (MITRE)
Contributing Editors: Susan S. Poh (MITRE)
Ernie H. Forman (MITRE)

The online version is announced to all Network members who receive online delivery from NIC. It can also be accessed by anyone who logs into SRI-ARC and uses the query language named nic.

The online version contains the month's basic issue. Each week a branch is added, containing items received during the week. At the first of the next month, the added branches are merged, any new items of the preceding week and some feature articles are included, and the basic issue for the month is produced to supercede the previous month's basic issue.

For scanning:

control c
nic CR
a/rpanet news/ CR
s/how/ (whatever you choose from the contents) CR
(to stop printing) control o
(to exit) q/uit/ CR

(to show statement numbers) v/:Type Viewspecs:/mG CR

For printing entire NEWS:

```
nls CR
l/oad/ f/ile/ <nic>arpanews CR CR
o/utput/ d/evice/ t/eletype/ CR
```

For printing updates only:

```
l/oad/ f/ile/ <nic>arpanewsup CR CR
o/utput/ d/evice/ t/eletype/ CR
```

One hardcopy of the monthly issue will be sent to each Liaison, Principal Investigator, and Station Agent at Network Sites, and to Network Associates. Local reproduction of multiple copies is encouraged.

To return to contents outline type s/how/n1 CR

(n3) CALENDAR Events of Network Interest

Type s/how/ (parenthetical name)

(Condensed)

Type s/how/ (parenthetical name)

4/10-13	(NMA-Mtg)
4/16-17	(ACM-LA)
4/16-18	(AIAA)
4/18-19	(ACM-SF)
4/27	(CSMA-Mtg)
4/28-5/1	*(ILL-ANTS)
Spring	*(NIC)
5/2-5	(DECUS)
5/16-18	(ONR)
6/4-8	(AFIPS)
8/20-24	(AI-SU)
10/15-17	(IEEE)

A meeting listed here is sponsored by the Group named. Many meetings are open to other interested people. NIC document references are given where available.

Meetings sponsored by Groups in the Network are indicated by *.

(NIC) Spring

NIC is soliciting comments on the interest in on-Site classes. Tentative plans include classes in Washington, D. C. the first week of May and in Boston the first week of June. Let DVN at the NIC know of your interest. (15266,)

(NMA-Mtg) 4/10-13

National Microfilm Association 22nd Annual Conference and Exposition, Detroit. Micrographics, from fundamentals to sophisticated systems applications, in 3 tracks for levels of expertise. Registration, NMA, 8728 Colesville Rd., Silver Spring, Md. 20910.

(ACM-LA) 4/16-17

ACM Psychology of Computer Programming. Seminar by Gerald Weinberg for senior personnel. Fee: $190, $235. Contact ACM, 1133 Ave. of Americas, N.Y. 10036. (212) 265-6300.

(AIAA) 4/16-18

Biennial AIAA Computer Network Conference will be held at the Carriage Inn Motor Hotel in Huntsville, Ala., April 16-18, 1973. The General Chairman is George H. Ludwig (NOAA/National Environment Satellite Service.) Sessions include:

MONDAY

9:00 AM Welcome and Keynote Address
10:00 AM Computer Networks and Systems I
2:00 PM Computer Networks and Systems II
4:30 PM Cash-Bar Cocktail Party

TUESDAY

9:00 AM National Programs
2:00 PM Machine Concepts and Operating Systems
6:30 PM No-Host Cocktail Party
7:30 PM Banquet

WEDNESDAY

9:00 AM Images and Computer Networks

Registration will begin on Sunday, April 15, 4 - 7 PM, Ballroom Lobby, Carriage Inn Motor Hotel.

...Extracted from announcement, by Jean Iseli

(ACM-SF) 4/18-19

ACM Psychology of Computer Programming. Seminar by Gerald Weinberg for senior personnel (See above)

(CSMA-Mtg)

4/27 in Chicago
7/20 in New York
10/18 in Washington
11/16 in Los Angeles CSMA Data Communications Seminars. Each is 2 workshops: Basic Data Communications Design Concepts, and Advanced Data Communications System Design. Fee $65, $75 (nonmembers). Communications Systems Management Assn., Suite 1003, 1102 West St., Wilmington, Del. 19801. (302)658-4117.

(ILL-ANTS) 4/28-5/1

ILL-ANTS will be hosting a 2-day session on ANTS MARK II. Urbana Ill. Invitation is coded NIC Catalog Item 14630.

Meeting agenda includes:
1. Formal presentation of the ARPA Network terminal system (ANTS).
2. Discuss setting up a formal users' group.
3. Discuss supporting mechanisms for maintenance and support of ANTS user installations.

Appendix D:

ARPANET NEWS via TTY

Copy of output when ARPANET NEWS is accessed from a TTY

INTRODUCTION

1

The ARPANET NEWS will be published online and in hardcopy by the NIC. This newsletter is your medium for informing the ARPANET community about events, plans, new capabilities, requirements, and other newsworthy items relative to your site.

1A

Submissions for the NEWS should be directed to Jean Iseli (JI), preferably through the Journal. Other persons desiring editorial involvement with the newsletter should direct their desires to JI.

1B

Prior to distribution, the NEWS will have been edited by Jeanne North of the NIC to ensure a coordinated effort with other mediums of information exchange initiated at the NIC. The ARPANET NEWS takes its place in Network information services amons the Journal, the RFC's, the Functional Documents, the NIC Announcement Bulletin, and the forthcoming NIC Journal Index. Its editors anticipate interesting expansion and development as Network contributors take advantage of its potential.

1C

Distribution will be made in an unusual way. An announcement will be sent you through the Journal when the basic issue of the month is published. The content of the issue will be printed in hardcopy for distribution. Newsgathering will be continuous, and each Monday a weekly update will be posted in online copies. The next month's issue will contain the interim news updates and added feature articles.

1D

In the following section giving information about the publication, there are instructions for accessing the NEWS online from a TTY or display. Hardcopy will be sent to all Sites through the mail.

1E

Although the content and format of the NEWS may vary, issue to issue, the following sections will be regarded as standard for each issue.

1F

CALENDAR	RESOURCE NEWS
ARTICLES	PLANS
FEATURED SITE	OTHER NEWS
PROTOCOLS	

1G

1H

ARPANET NEWS Information About the Publication

2

Issue 1 March 1973
Online version prepared weekly
Hardcopy version distributed monthly

2A

Distributed by: ARPA Network Information Center
Stanford Research Institute
Menlo Park, California 94025

2B

Editors: Jeanne B. North (NIC)
Jean Iseli (MITRE)
Contributing Editors: Susan S. Poh (MITRE)
Ernie H. Forman (MITRE)

2C

The online version is sent to all Network members who receive online delivery from NIC. It can also be accessed by anyone who logs into SRI-ARC and uses the query language named NIC.

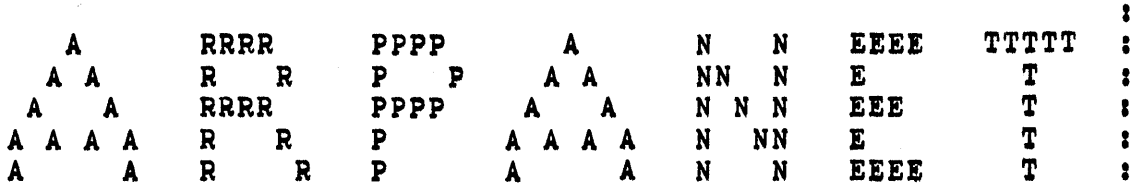
2D

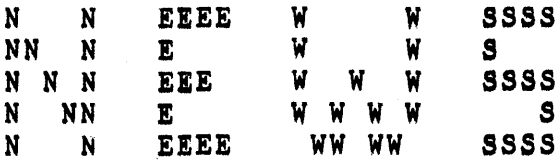
The online version contains in its first branch the month's

Appendix E:

ARPANET NEWS in Hardcopy

Sample of cover and pages from ARPANET NEWS as formatted for hardcopy distribution.





Issue 1

March 1973

ARPA Network Information Center
Stanford Research Institute
Menlo Park, Calif. 94303

CONTENTS

INTRODUCTION

2

The ARPANET NEWS will be published online and in hardcopy by the NIC. This newsletter is your medium for informing the ARPANET community about events, plans, new capabilities, requirements, and other newsworthy items relative to your site.

2a

Submissions for the NEWS should be directed to Jean Iseli (JI), preferably through the Journal. Other persons desiring editorial involvement with the newsletter should direct their desires to JI.

2b

Prior to distribution, the NEWS will have been edited by Jeanne North of the NIC to ensure a coordinated effort with other mediums of information exchange initiated at the NIC. The ARPANET NEWS takes its place in Network information services among the Journal, the RFC's, the Functional Documents, the NIC Announcement Bulletin, and the forthcoming NIC Journal Index, Its editors anticipate interesting expansion and development as Network contributors take advantage of its potential.

2c

Distribution will be made in an unusual way. An announcement will be sent you through the Journal when the basic issue of the month is published. The content of the issue will be printed in hardcopy for distribution. Newsgathering will be continuous, and each Monday a weekly update will be posted in online copies. The next month's issue will contain the interim news updates and added feature articles.

2d

In the following section giving information about the publication, there are instructions for accessing the NEWS online from a TTY or display. Hardcopy will be sent to all Sites through the mail.

2e

Although the content and format of the NEWS may vary, issue to issue, the following sections will be regarded as standard for each issue.

2f

CALENDAR
ARTICLES
FEATURED SITE
PROTOCOLS
RESOURCE NEWS
PLANS
OTHER NEWS

2g

ARPANET NEWS Information About the Publication

3

Issue 1 March 1973
Online version prepared weekly
Hardcopy version distributed monthly 3a
Distributed by: ARPA Network Information Center
Stanford Research Institute
Menlo Park, California 94025 3b
Editors: Jeanne B. North (NIC)
Jean Iseli (MITRE)
Contributing Editors: Susan S. Poh (MITRE)
Ernie H. Forman (MITRE)

3c

The online version is sent to all Network members who receive online delivery from NIC. It can also be accessed by anyone who logs into SRI-ARC and uses the query language named NIC.

3d

The online version contains the month's basic issue. Each week a branch is added, containing items received during the week. At the first of the next month, the added branches are merged, any new items of the preceding week and some feature articles are included, and the basic issue for the month is produced to supercede the previous month's basic issue.

3e

For scanning on TTY:

```
control c
nic  CR
a/rpanet news/  CR
s/how/  (whatever you choose from the contents)  CR
(to stop printing) control o   (to exit) q/uit/  CR
(to show statement numbers v/:type View specs:/ mG  CR
```

For printing entire NEWS:

```
nls
l/oad/ f/ile/ <nic>arpanews  CR CR
o/utput d/evice t/eletype/  CR
```

For printing updates only:

```
l/oad/ f/ile/ <nic>arpanews  CR CR
SP .2  CR
o/utput/ d/evice/ t/eletype/  CR
```

From a display, enter NLS, load file <nic>arpanews, and look at various levels by changing viewspecs.

One hardcopy of the monthly issue will be sent to each Liaison, Principal Investigator, and Station Agent at Network Sites, and to Network Associates. Local reproduction is encouraged. 3f

CALENDAR Events of Network Interest

4

A meeting listed here is sponsored by the Group named. Many meetings are open to other interested people. NIC document references are given where available.

4a

Meetings sponsored by Groups in the Network are indicated by *.

4b

DATE	SPONSOR	MEETING	PLACE	NIC

4c

	NIC	No TNLS Course in March		

4d

3/16	FTPIG	*File Transfer Protocol Meeting Anyone wishing to attend should contact Alex McKenzie (Ident AAM) at BBN.	BBN	

4e

3/22-23 ACM Psychology of Computer Programming Chicago
Seminar by Gerald Weinberg for senior personnel
Fee:$190, $235. Contact ACM, 1133 Ave. of the Americas, N.Y. 10036 (212) 265-6300.

4f

3/27-29 Conf on Industr Robot Techny Nottingham,Eng.
(Datamation, Feb)

4g

3/28-30 IEEE INTERCON/73 N.Y.
Theme: Solid State Shapes the Future.
Contact: Don Larson, IEEE, 345 E. 47th, N.Y. 10017.
(Datamation, Jan)

4h

4/1-4 IIA 5th National Meeting Phila.
Theme: Information: The Industry of the 70s?
IIA, 904 Montgomery Bldg., Wash.D.C. 20014 (301) 654-4150.

4i

4/4 IEEE Minicomputers--Trends, Applications Gaith,Md.
Contact: Minicomputer Symp., P.O. 639, Silver Spring, Md 20901.

4j

4/16-17 ACM Psychology of Computer Programming L.A.
Seminar by Gerald Weinberg for senior personnel
Fee:$190, $235. Contact ACM, 1133 Ave. of the Americas, N.Y. 10036 (212) 265-6300.

4k

4/18-19 ACM Psychology of Computer Programming S.F.
Seminar by Gerald Weinberg for senior personnel
Fee:$190, $235. Contact ACM, 1133 Ave. of the Americas, N.Y. 10036 (212) 265-6300.

4l

5/16-18 ONR Symp. on Complexity of Seq. and Numerical Algorithms. Contact: Computer Science Dept., CMU CMU

4m

6/4-8 AFIPS 1st Natl Computer Conf.& Expo. N.Y. Chmn, Methods and Applications Program, Dr. Robert W. Bemer, c/o Honeywell Information Systems, P.O. Box 6000, Phoenix, Ariz., 85005 (602)993-2569.

4n

8/20-24 3rd Intl. Jt. Conf. on AI Stanford Contact: Prof. J. McCarthy, SU-AI (Artificial Intelligence, 3, 1972, p.289-290)

4o

10/15-17 IEEE, Switching & Automata Theory Symp. Iowa City 13957 U.Iowa 14th Annual. Abstracts to: H.R. Strong, IBM TJW Res.Center, P.O. 218, Yorktown Heights, 10598. Reg.: Prof. Gerard Weeg, Chmn.Comp. Sci. Dept., U.of Iowa, Iowa City, 52240

4p

ARTICLES Reports from COMPCON 73

5

Notes on the Conference

5a

COMPCON 73 opened its 3-day program Tuesday February 28. This is the "first annual" COMPCON in S.F. (There was a COMPCON 72 last September, and this is also the 7th annual IEEE Computer Society International Conference.) The theme was "Computing Networks from Minis through Maxis--Are They for Real?"

By Wednesday, over 700 attendees had registered. Attendance at sessions was large and steady. Ties and jackets were the norm, and dialogue was even-toned. No tensions were evident, the atmosphere was purposeful, prosperous, confident. There were no exhibits. Small-group conversation was facilitated by cocktail hours, 5-7, in the meeting-room area, on Tuesday and Wednesday.

Dr. Ruth Davis' keynote address is digested on the next page, and excerpts from Larry Roberts' leadoff paper follow. Many other Network members were speakers, and the Digest of Papers of the Conference, available from IEEE for $15 or $20 (nonmembers), is a recommended acquisition.

----------Jeanne North

5a4a

Excerpts from Ruth Davis' Keynote Address

5b

Computing Networks: a Powerful National Force
Keynote Speech COMPCON 73 February 27 1973 5b1

Dr. Davis' paper is online (14758,). (Online users will recognize this parenthetical expression as a link to the online file). This is a 3-page excerpt, and those readers who have access may prefer to print out the original file.

5b2

5c

"I believe we should highlight the truth today; namely that:

5c1

"1. Computer networks are essential for all those real time geographically dispersed control activities vital to our individual and national well being...

5c1a

"2. Computer networks are the only practical means available for the sharing of expensive information resources, computing resources, and information handling equipment...

5c1b

"3. Computer networks are the only practical means of providing equality of access to and an equality of quality in public services, independent of geographical location...

5c1c

"4. Minicomputers are becoming personal computing resources and minicomputers linked to computer networks provide each of us our own individual information center.

5c1d

"..Researchers should be truly excited over the prospects of simultaneously having a minicomputer as a personal computer resource and, through it, being able to share results with peers everywhere. With computer networks, the loneliness of research is supplanted by the richness of shared research.

"5. Maxicomputers available through computer networks are perhaps the only economically justifiable means for the large scientific calculations essential to the advancement of much needed basic research and engineering.

5c1e

"..Computer networks perform two essential tasks in developing increased computer power. They aggregate the market for computing power and they supply the sole means for cost-sharing expensive development among customers.

"6. Manufacturing without minicomputers in the production process will be unheard of...

5c1f

"7. Centralized management, in a real-time sense, of geographically dispersed organizations is impossible without computer networks...

5c1g

"I should like to advance a four-part plan that I consider as minimal in meeting our obligation--as network users and technologists--to society and to the beneficial application of computer technology.

5c2

"1. We must stop the trend towards negative actions being taken at the national level in dealing with computer networks.

5c2a

"..What we are experiencing is a reaction against all types of computer networks based on condemnation of practices in the "data bank" networks.

"..We must work together as customers for and providers of computer network services, to obtain executive, legislative and judicial actions that encourage or demand, as appropriate, the disciplined, controlled access to computer network services...

"..I should like to stress the need we have today for the IEEE Computer Sociey, the ACM and AFIPS as professional societies to present coordinated plans for imaginative and innovative development of computer networks as a service to any or all segments of government, industry and academia.

"2. We must stop treating computer networks as tinker toys of technology and recognize that they have become technological partners to management, to services, and to government.

5c2b

"..By the mid-1950's more than half the population of the United States was not making things to eat or use, but was gainfully employed doing something for other people. Thus, the United States became a service economy and the first post-industrial nation. Today, more than 63% of the United States labor force is employed in the service industry. By 1980, statisticians believe that two out of three members of the labor force will be part of the service sector.

"..The technologies that are integral with a service economy or a post-industrial society and those which are essential to achieve its goals include communications technology, computer technology and information technology. These are best linked to users, services, and products by means of computer networking.

"3. We must realistically plan a future for computer networks without a government public or national policy. There is no federal or national policy today concerning computer network utilization. I foresee none in the near future. Neither do I see any convergence of opinions as to either the need for or the content of any Federal or national policy. In fact, if anything, there is an increasing fractionalization of opinion on the subject.

5c2c

"4. We must isolate the major impedimenxs to computer utilization today and focus our attention as well as the attention of national leaders on them...The problems which constitute serious threats to good network usage include:

5c2d

"a. An inability to control accessibility to computer networks so as to provide adequate guarantees of privacy and security.

"b. A lack of fair and uniform pricing policies.

"c. A total inadequacy of documentation which would allow efficient network use...

"d. An inadequacy of standards governing network usage ranging from the use of programming languages to the hand-shaking or network protocols.

"e. The lack of conventions for protecting the rights of customer and seller alike.

"f. An inability to perform real-time control functions via computer networks.

"g. The lack of specification of levels of network service and the lack of means of assurance that specified service levels have been met.

"For example networks have generated a new phenomenon which I shall call:

"'Solutions Without Redress'"

"This problem manifests itself when a customer uses a program supplied on the computer network to obtain answers which are used by the network customer in selling his product or service--and the answers are wrong.

"As computer professionals, we owe the world a continuing technological assessment of computer networks. Indeed, there are a number of questions to which all of us interested in the assessment of computer networks would like to have answers. Some of these are:

5c3

"How have computer networks changed the customers for computer services?..

5c4

"How have computer networks increased the types of applications of computers for industry, academia and govenment?..

5c5

"How have computer networks been utilized to increase productivity in a measurable way in manufacturing, in services or in government?..

5c6

"How have computer networks reduced the costs of sharing information and computer power so that costs of management and decision making are reduced relative to quality of output?

5c7

"How have computer networks affected computer system design, architecture, technology and popularity?..

5c8

"How have computer networks aided the performance of public services and thus gained the favor of large segments of the American public?..

5c9

.....excerpted by Jeanne North

5c10

Excerpts from Larry Roberts' Paper

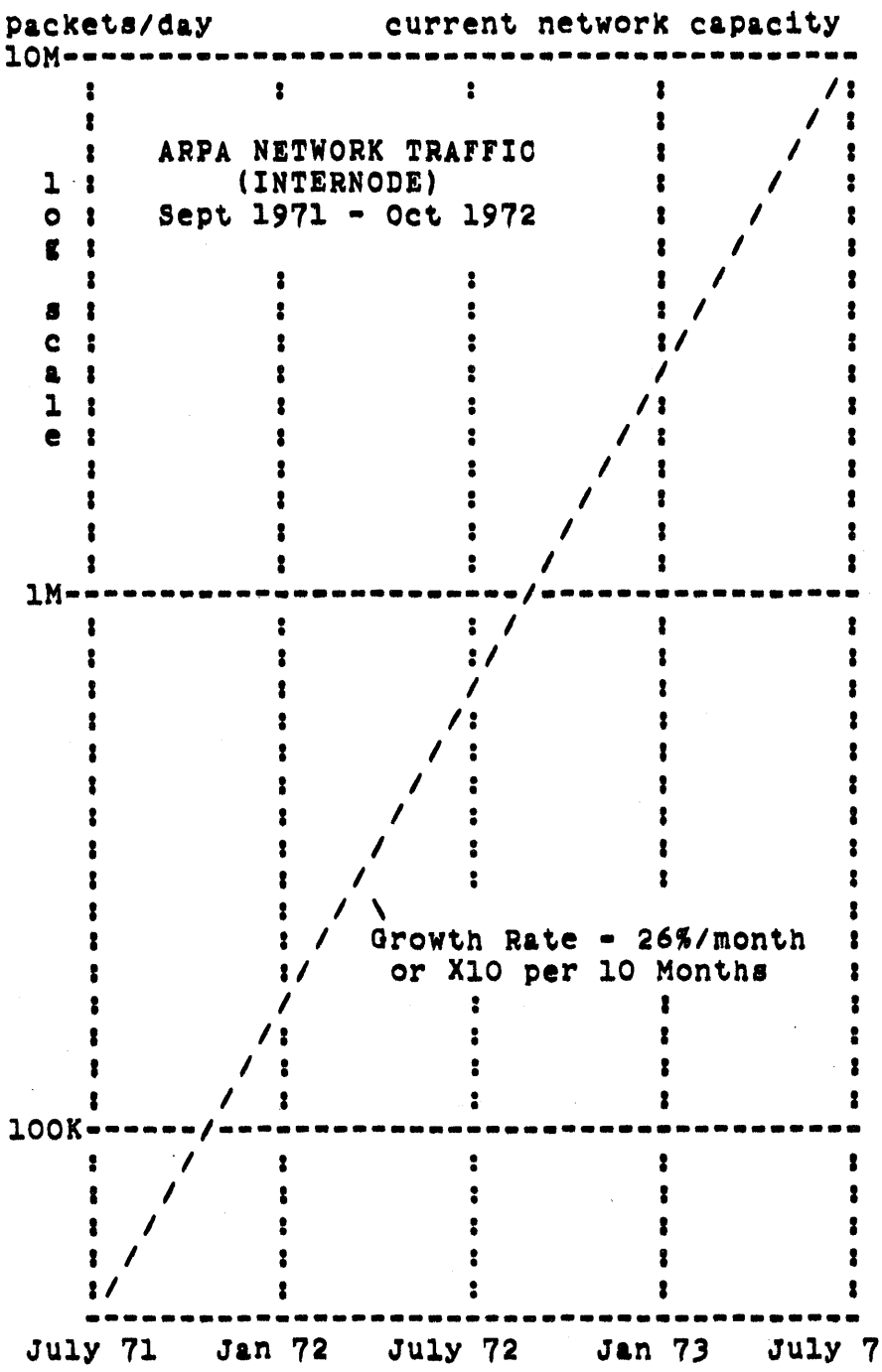
5d

Network Rationale: a 5-Year Reevaluation

"A six-month Air Force test of the network for the pure movement of data traffic showed that throughput rates of 20-30 KB could be maintained. (Forthcoming changes to the routing technique should more than double this.) The test results also showed a lower monthly cost, while providing at least ten times the throughput and responsiveness of the alternatives available. So it has turned out that this type of network usage (pure data movement) is both economic and attractive even though the original design goals of the network were aimed at interactive computing. For the network, such data traffic is useful since it provides a large low-priority background load which expands the instantaneous capacity available and helps maintain efficient line utilization, thus reducing the cost to everyone.

"...Usage has increased exponentially at..26% per month..while network size has only increased linearly by one node per month. Internode traffic in October 1972 /see graph/ was 1.3 million packets per day which corresponds to 9% of the compute power in the network being used remotely...the network also handled .45 million packets per day of local traffic, which means that 12% of the total computing power of the network's 22 serving host computers was distributed via the network. On an annual basis the value of this computer time would be $2.1 M or slightly more than the network cost. However, at the current growth rate the network should be fully loaded by July 1973...Since the cost saving incurred by selecting the proper network computer for each problem is usually 100 to 300%, the network is already cost-effective. When it is fully loaded, the network costs only amount to 10-15% of the computer costs."

Online version of Figure 1



excerpts and graph....Jeanne North

Other Sessions

5e

Two sessions at COMPCON 73 titles "Examples in the Business Community" and "The Singer Retail Network" were added to the program as examples of networks that are being implemented in business and industry today. These examples provided balance to a program otherwise largely describing networks and design problems in academia and government-supported examples.

The Singer retail net is one for the purpose of handling the information in department stores directly related to point-of-sale, cash management, and inventory. The Jewel Companies, Inc. network is an in-store minicomputer driving point-of-sale terminals in a supermarket environment. Such Electronic Store Information Systems (ESIS) provide management information to the local store manager. These in-store minicomputers are connected via common carrier to a large computer utility at corporate headquarters which permits not only the necessary information transfer by the local and corporate levels but general computation power and file inquiry at the store level. The Honeywell Information System paper described the specialized, intelligent terminal to be used in a banking network environment.

----------Steve Miller

FEATURED SITE Range Measurements Lab

6

The Range Measurements Laboratory, Patrick Air Force Base, Florida, has recently been connected as a major terminal in the ARPANET. Col. Edward P. Schelonka acts as Liaison, and Michael B. Young is serving as Station Agent.

6a

The Laboratory has been in existence since 1965 and has been and is involved primarily with ARPA projects requiring a quick reaction response to technological concepts.

6b

Assigned projects have required the exercise of a variety of disciplines, with the assigned staff members performing all the steps of hardware and system implementation beginning with the original concept, through design and fabrication to field testing and system turnover to the final customer. In doing these things, the Laboratory has developed the staff skills and physical facilities to perform significant work in the following fields:

6c

a. Advanced optics, including absolute optical measurements, interferometry and analyses of optical imaging and image tracking technology;

b. Radar and tracking analysis, including re-entry and field measurements analysis;

c. New systems concepts and analysis;

d. Photo/chemical techniques and analysis;

e. Electronic systems;

f. Tethered lighter-than-air research and operation;

g. Image restoration and analysis;

h. Computer systems design including real time applications.

In the Fall of 1972, arrangements were made by Mr. Harold Newby, Imaging Systems Branch Chief, and Mr. Walter H. Manning, Jr, Laboratory Director, to have some of the ARPANET management functions transferred to the Laboratory. Since that time a gradual transition has occurred so that now the responsibility for development, expansion, operation, and maintenance is within the Data Systems Branch of which Lt. Col Edward Schelonka is Chief. The RCA Services Company provides technical assistance to the Laboratory in support of ARPANET functions as well as other programs.

6d

ARPA Headquarters has given RML responsibility in several areas: 6e
Development, operation, maintenance, management and expansion of the ARPA Network.

Assignment of communication lines for the Network.

Arrangement, through Defense Commercial Communications Office (DECCO), to place requirements on ATT to provide lines.

Apprising government community of services available, to the extent of contacting potential user, talking with him, sending him to MITRE to look at Network features.

Study of functioning of present ARPA Network features, and identification of what would be required to set up a commercial network.

The RML TIP was brought up in January of 1973 and on 7 February 1973 intefaced with a terminal to allow use of Network Resources. 6f

----------Mike Young

PROTOCOLS

7

UTAH-10 : Receiving favorable response to RFC 403 (11925,) 7a
UTAH is progressing, post haste, to implement an RJE Server to allow network users to submit batch jobs both to their PDP-10 and UNIVAC-1108. Availability is projected towards the end of March, first of April time period this year. One deviation from 'Standard' Protocol: if the foreign host will not accept block structured FTP type transfers, the transfer will default to 8 bit ASCII type. Documentation relative to access mechanisms will be forthcoming.
.....Greg Hicks

7b

RESOURCE NEWS New Programs and Publications

8

CCA-TENEX: The version of the DATACOMPUTER software that was used for the 'weather demo' at the ICCC in Washington last October is running at CCA under the name 'RELEASE 0/8'; several Network sites are using it on an experimental basis. 'RELEASE 0/9', which incorporates better error diagnostics and some new features will be available this Spring. Owners of large data bases who would like to store them on the DATACOMPUTER and use its Data Management facilities should contact Don Cantor at: Computer Corporation of America, 575 Technology Square, Cambridge, Mass. 02139. ----------Don Cantor

8a

Harvard - 10 : A new remote job entry service is announced; 8b
documentation is in preparation; anxious to have Network users employ capability; preliminary indications of interest should be directed to Bradley Reussow (617) 495-3998.
.....Bradley Reussow

8c

ILLIAC : Small interactive programs can now be run on the ILLIAC-IV.
.....Steve Crocker

8d

LLL : Will accept an 11/10 in June on which they will run ILL's standard ANTS. By year's end, and perhaps even by September, they will receive their 11/45 on which they will run their own homegrown multiprocessing system. .....Jed Donnelley

8e

SRI-AI : Documentation for QA4, an experimental programming language for writing problem-solving programs, is published as Artificial Intelligence Center Technical Note 73 "QA4: A Procedural Calculus" by J.F. Rulifson, J.A. Derksen, and R.J. Waldinger. (NIC Catalog Item 13318).....Mike Wilber

8f

UCLA-CCN : A new version of the structural analysis package, NASTRAN, is now available. .....Bob Bell

8g

UCSB : A PDP-11 with a special host interface is now up and represents the first very distant host on the network.
.....Roland Bryan

8h

PLANS

9

ALOHA TIP : is up and has 3-5 terminals active; plan to connect BCC computer in the future.
.....Chris Harrison (UH)

9a

LBL : Expects to have its CDC 7600 and CDC 6600 on the Network by July 1. .....Bob Fink

9b

MIT : A second IMP will be installed to accomodate a fifth host.
.....ARPA/IPT(Dolan)

9c

Kjeller Institute : Expected to join Network by mid-May '73. 9d
Kjeller
P.O. Box 25
Kjeller, Norway
Telegrams: FFIEE Lillestrom
Telephone: Lillestrom 71 26 60 9e
Plans, which are not finalized, are for a connection to "RBK-Computer Center" (CDC-Cyber-74) : will consider exchange agreements with other ARPANET Host installations. Will support: RJE and Interactive (CD"Intercom") and Control Data 6RM Record Manager. Norwegian Climatological data and onservation material available on special request from one of their users, the Norwegian Meteorological Institute. .....Yngvar Lundh

9f

Rutgers University : Expected to join ARPANET through a TIP by summer 1973. .....ARPA/IPT(Dolan)

9g

UCSD-CC : NETRJE will be available by 1 April 1973; initial contacts should be directed to Craig Mauldlin as Network Consultant.
.....Ken Bowles

9h

UCSD-CC : A new Lisp interpreter is being implemented on the B-6700 and should be completed within this calendar year.
.....Ken Bowles

9i

OTHER NEWS

10

ARPANET : There are now: 35 Nodes; 15 TIPS; 16 PDP-10's , 10 TENEX Operating Systems; 6 PDP-11's; 2 PDP-1's; 5 IBM-360's; 1 IBM 370; 1 TX-2; 1 Honeywell 645; and 1 Sigma 7. In July, the first CDC 6000 Series computers will join the network.

10a

ARPA/IPT : Transfer of functions to RML and MITRE 10b

Several functions previously performed directly by ARPA/IPT relative to the Network will in the future be performed by RML and the MITRE Corporation. RML's functions are described in the featured-site article and those of MITRE will be featured in the next issue of ARPANET NEWS. .....Editors

10c

SRI-ARC : New version of Resource Notebook currently being sent to new users; old users next; priority to old users who will validate information and submit updates.
.....Jake Feinler

10d

TENEX : RJS problems 10e

TENEX uses two different end of line indicators (EOL -- one byte -- and CR/LF -- two bytes) while their RJS program that submits jobs to CCN will sometimes not accept data from TENEX because TENEX's record count does not match CCN's. The easiest way to remedy the problem is to read the data file into TECO and then output (;U) it back to a TENEX file. .....Dave Crocker (UCLA-NMC)

10f

Appendix F:

SIGART NEWSLETTER Instructions

Instructions for online access and for comment insertion. Shows use of TNLS, online system developed at SRI-ARC.

<SIGART>NEWS.NLS;24, 16-APR-73 13:26 KIRK ;

HOW TO ACCESS DOCUMENTS FROM THIS FILE
(1:mwy)

In the syntax for commands,
* = the prompt from the system
SP = space
CR = carriage return which is COMMAND ACCEPT.
STATEMENTNUMBER = the characters at the beginning of every statement after statement numbers have been turned on.
The text inclosed in /square brackets/ is echoed on full-duplex terminals.

To list documents that you can reach from this file, print branch .0 with viewspecs that show STATEMENTNUMBERs with one line of each statement in the first level:

*p/rint/ b/ranch/ .0 CR mx CR

To get a table of contents view of the document itself, print its branch with a space up-arrow:

*p/rint/ b/ranch/ .STATEMENTNUMBER SP ↑ CR CR

/Table of contents view/

/<directory>filename/

To select the heading of interest to you in the online document, and print the branch with the viewspecs set to display the complete text, type:

*p/rint/ b/ranch/ .STATEMENTNUMBER CR w CR

To return to a file from which you linked to the current file use the jump to file return command.

*SP & CR

Type CTRL O to stop printing. (CONTROL O, or ↑O)

Type CTRL X for command delete. (CONTROL X, or ↑X)

Type Line Feed (LF) to print one statement at a time.

Information about links. (1G:ebwg)

An up arrow searches the statement for a link and then follows the link.

The system then prints the branch in the file named in the link.

The links include viewspecs that curtail print commands so they display table-of-contents-like samples of the object documents.

After you use an address that loads a second file, the system echoes the directory and file name.

The linkstack command will list the last five files you have read.

*e[xecute] st[atus] l[inkstack]

For more information about links, type:
*p[rint] b[ranch] .1I5 SP ↑ CR CR
and it will take you to this document: (journal,7473,5).

To COMMENT on a statement or section in the online newsletter, send a journal message in NLS using the following syntax so a link to your journalized comment can appear at the appropriate place in the online newsletter,

in the syntax for commands below,
& = Prompt from the Journal System
&& = Prompt from the Journal Subsystem
filename = the first three letters of the month immediately followed by the last two digits of the year of the newsletter on which you are commenting. Example: OCT72, DEC72, FEB73, or APR73.

*E[xecute] J[ournal]
&S[ubmit] M[essage]

Type in your comment.

CR
&&I[nterrogate] CR
&&[Title:]COMMENT ON: (filename,STATEMENTNUMBER) Author's Name optional additional words CR
&&[Distribution] COMMENT (you can add other valid idents here) CR
&&[Status] CR
[all information will be echoed]
&&[GO?] CR
[Journal System in Progress
Completed]

If your comment already exists as part or all of an NLS file, you can submit that instead of a message by specifying the NLS structural entity instead of M[essage]. For example:

*E[xecute] J[ournal]
&S[ubmit] F[ile] CR

or

*E[XECUTE] J[OURNAL]
&S[UBMIT] B[ranch] .STATEMENTNUMBER CR

or

*E[XECUTE] J[OURNAL]
&S[UBMIT] P[lex] .STATEMENTNUMBER CR

The rest of the syntax is the same as submitting a message

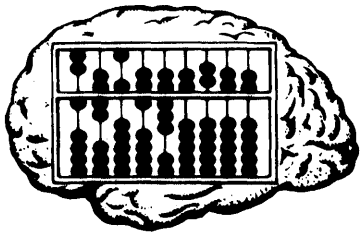
```
SIGART NEWSLETTER OCTOBER  1972
(OCT72,O:xmz)

SIGART NEWSLETTER DECEMBER 1972
(DEC72,O:xmz)

SIGART NEWSLETTER FEBRUARY 1973
(FEB73,O:xmzh)

SIGART NEWSLETTER APRIL    1973
(APR73,O:xnz)

DOCUMENTS FORMATTED FOR OUTPUT PROCESSOR HARDCOPY
(:ebmt)

   SIGART NEWSLETTER FEBRUARY 1973
   (14886,O:xnz)

   SIGART NEWSLETTER APRIL    1973
   (APRIL73,O:xnz)
```

Appendix G:

SIGART NEWSLETTER in Hardcopy

Copies of SRI-ARC computer-printed Editor's page, with cover and masthead supplied by ACM.

SIGART
NEWSLETTER



acm

A Bimonthly Publication of the ACM Special Interest Group on Artificial Intelligence

Number 38 FEBRUARY 1973

CONTENTS

SIGART NEWSLETTER

The SIGART Newsletter is a bimonthly publication of the Special Interest Group on Artificial Intelligence of the Association for Computing Machinery. The Newsletter reports on projects being conducted by the artificial intelligence research community and generally reviews current progress in the state-of-the-art. Correspondents report news from local SIGART Chapters and other AI Centers.

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The Editors encourage contributions from authors, including Letters to the Editor (AI Forum), Technical Contributions (typically 1 to 6 pages; unless otherwise stated these are to be treated as unrefereed working papers), Abstracts (preferably 100-200 words), Book Reviews, Bibliographies of Special Topics in AI, News Items (Conferences, Meetings, Course Announcements, Personals, etc.), Advertisements (New Products or Classified Advertising), Puzzles, Poems, Cartoons, etc. Material may be reproduced from the Newsletter for non-commercial purposes with credit to the author and SIGART.

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Copy deadline for the April Issue: March 23rd.

EDITOR'S ENTRY

1. On-Line Newsletter

In keeping with our philosophy of compiling and editing as much of the Newsletter on-line as we can, Rich and I have begun to enter newsletter material directly in machine-readable form immediately upon receipt from reporters or others. This explains the minor change in paragraph format, etc. in the current issue. We hope the more timely access possible over the Network will more than compensate for lack of direct underlining and subscripting capability in the final published version. Please give us your comments.

2. Newsletter Reporters

As of this date, the following persons have agreed to act as SIGART Newsletter Reporters at their respective locations:

	Center	Reporter
1.	BBN	Bill Merriam
2.	Case	Ranan Banerji
3.	CMU	Don McCracken
4.	Maryland	Jack Minker
5.	MIT	Gene Charniak
6.	NIH	R.C.T. Lee
7.	SDC	Charles Kellog
8.	SRI	Rich Fikes
9.	Stanford	Peggy Karp
10.	UCSD	Marc Eisenstadt
11.	USC	Bob Balzer
12.	Wisconsin	Rob Kling
13.	Xerox (Palo Alto)	Phil Jackson

Since reporters will soon be getting instructions about how to submit material directly over the Network, if you reside in one of the above AI centers, your first point of contact for submitting material should be your local reporter. However, you should still feel free to communicate directly with us, as the occasion demands. Conversely, as your local reporter solicits news or contributions from you, we hope you will cooperate.

A Bimonthly Publication of the
ACM Special Interest Group on Artificial Intelligence

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3. Five Year Prediction is Satisfied (Almost)

While your Editor was present at a panel discussion on AI at Noon on August 6, 1966 at Edinburgh University, Scotland, Prof. John McCarthy made the following public prediction:

> "A robot hand-eye project will screw a nut onto a bolt within five years."

In retrospect, such a prediction seemed quite radical at the time. However, in 1969 Prof. McCarthy was observed to be highly optimistic about his five-year prediciion, feeling that five years was actually a conservative estimate.

According to reliable sources, the feat of "screwing a nut on a

Appendix H:

CSO Indexes

printout of a portion of a directory file containing online links, location of offline copies, editing instructions, and definitions of a collection of ARC Computer Support Operation hardware catalogs.

<DOCUMENTATION>SRI-ARC-CSO.NLS;3, 20-APR-73 11:52 KFB ; .PES; .PGN=-1;
.HJOURNAL="*** DRAFT *** MEH .GDT; NUMBER"; .H1=".H1P=2;SRI-ARC-CSO,
SRI-ARC'S CSO FACILITY DIRECTORY, manual A"; .MCH=65; .SNF=72;

(CSO) SRI-ARC COMPUTER SERVICE OPERATION FACILITY DIRECTORY
This is a directory file containing on-line links, location of off-line copies, editing instructions, and definitions of a collection of ARC-CSO Hardware catalogs, The format of each catalog was designed to take advantage of the NIC Query and NLS Viewspec capabilities.
.LBS=0; .PLEV=3;

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(SER) SRI-ARC-CSO hardware service; MANUAL E ,
      on-line location:  (DOCUMENTATION,service,)
 - DEVICE CATALOG containing: service contact, manufacturers name, and
maintenance contract information. .PLEV=2;
                                                                      1
   (DEC)  PDP-10 SYSTEM                                              1A
   (TASK) TASKER                                                     1B
   (NOV)  NOVA 1220                                                  1C
   (IML)  IMLAC                                                      1D
   (LP)   LINE PRINTER                                               1E
   (XCO)  XCORE                                                      1F
   (IMP)  IMP                                                        1G
   (TI)   TEXAS INSTRUMENTS                                          1H
   (TTY)  TELETYPES                                                  1I
   (EXEC) EXECUPORT                                                  1J
   (MOU)  MOUSE                                                      1K
   (TERM) TERMICETTES                                                1L
   (DS)   DATA SETS                                                  1M
   (TVM)  TV MONITORS                                                1N
   (ANS) answering service
       see (14597,)                                                  1O
   (HELP) Help                                                       1P
```

<DOCUMENTATION>MANUFACTURER.NLS;1, 29-MAR-73 8:52 KFB ; .PES; .PGN=-1;
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MANUFACTURER DIRECTORY, MANUAL B"; .LBS=1; .MCH=65; .SNF=72;

(man) manufacturer, MANUAL B,
on-line location: (DOCUMENTATION,manufacturer,)
- MANUFACTURER CATALOG containing: addresses, sales contact, service representative, and other general information .PLEV=2;

		1
(AMP)	AMPEX	1A
(BBN)	BOLT BERANEK AND NEWMAN INC.	1B
(NCC)	NETWORK CONTROL CENTER	1C
(DP)	DATA PRODUCTS	1D
(DEC)	DIGITAL EQUIPMENT CORP.	1E
(HON)	HONEYWELL, INC.	1F
(WJP)	WILLIAM J. PURDY CO.	1G
(TASK)	TASKER INDUSTRIES	1H
(PT)	PACIFIC TELEPHONE	1I
(TI)	TEXAS INSTRUMENTS	1J
(IML)	IMLAC CORP.	1K
(CONR)	CONRAC CORP.	1L
(CD)	COMPUTER DISPLAYS INC.	1M
(ICP)	INTERNATIONAL COMPUTER PRODUCTS, INC.	1N
(DG)	DATA GENERAL	1O
(HELP)	Help	1P

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<DOCUMENTATION>MANUFACTURER.NLS;3, 24-MAY-73 10:01 KFB ; .PES; .PGN=-1;
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MANUFACTURER, MANUFACTURER DIRECTORY, MANUAL B"; .LBS=1; .MCH=65;
.SNF=72;

(man) manufacturer, MANUAL B,
      on-line location:  (DOCUMENTATION,manufacturer,)
 - MANUFACTURER CATALOG containing: addresses, sales contact, service
representative, and other general information .PLEV=2;

   (AMP)  AMPEX
      (ADR) Address:
       120 Independence Drive
       Menlo Park, CA   94025
       Phone: 367-3861
      (SAL) Sales Contact: Bob Trick
      (SER) Field Service:
       Earl Coward or Bob Porter
       367-3861
      (COM) comments:
       Training Department
       Larry Gordley
       Marina Del Rey
       (213) 821-8933
   (BBN)  BOLT BERANEK AND NEWMAN INC.
      (ADR) Address:
       50 Moulton Street
       Cambridge, Mass.
       (617) 491-1850
      (SAL) Sales Contact:
       at BBN -- Alex McKenzie
      (REP) Service Rep:
       BBN
       Mac McKinley
       (617) 491-1850 ext 484
      (COM) comments:
       Return bad Pager cards to Mac's attention.
   (NCC)  NETWORK CONTROL CENTER
      (ADR) Address:
       50 Moulton Street
       Cambridge, Massachusetts
       Phone: (617) 661-0100
      (SAL) Sales Contact: Alex McKenzie
      (REP) Field Service:
       Marty Thrope or Joel Levin
       All repairs of the IMP are arranged through
       the Network Control Center.  BBN also takes
       care of repair of phone lines for the IMP and
       voice line between nodes.  Regularly scheduled
       PM (by Honeywell) is the first Wednesday of
       every month, in the AM.
   (DP)   DATA PRODUCTS
      (ADR) Address:
       Data Devices Inc.
       100 California Street
       Suite 250
```

Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY *(Corporate author)*

Stanford Research Institute
Menlo Park, California 94025

2a. REPORT SECURITY CLASSIFICATION

Unclassified

2b. GROUP

3. REPORT TITLE

EXPERIMENTAL DEVELOPMENT OF A SMALL COMPUTER-AUGMENTED INFORMATION SYSTEM

4. DESCRIPTIVE NOTES *(Type of report and inclusive dates)*

Annual Report Covering the Period 15 April 1972 through 15 April 1973

5. AUTHOR(S) *(First name, middle initial, last name)*

Jeanne B. North, Research Analyst
Augmentation Research Center

6. REPORT DATE	7a. TOTAL NO. OF PAGES	7b. NO. OF REFS
15 April 1973	87	35

8a. CONTRACT OR GRANT NO.	9a. ORIGINATOR'S REPORT NUMBER(S)
N00014-70-C-0302	Annual Report for SRI Project 8622
b. PROJECT NO.	
c.	9b. OTHER REPORT NO(S) *(Any other numbers that may be assigned this report)*
d.	SRI-ARC 16508

10. DISTRIBUTION STATEMENT

11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY
	Information Systems Branch Office of Naval Research Department of the Navy

13. ABSTRACT

During the third year, the emphasis was on provision of prototype information services. Online catalogs and directories were made available to users at network sites around the country. Provision was made to allow users to write and execute text-analysis programs. A Query system was designed that allows novice users to gain quick access to highly structured data bases. An index-like file with user-tutorial features was created for reader access to online files at NIC. Two online publications, a newsletter and a professional journal, were inaugurated. In addition, some background studies were made of the features desirable for research information services.

14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Research Intelligence System						
Online System						
ARPA Network						
Intellect augmentation						
Man-machine communication						
NLS						
TNLS						
Catalog file-building						
Data elements						
Query languages						
Knowledge workshop						
Journals						
Publication						