Memo: SETTING UP A NETWORK DIALOGUE SYSTEM - NIC 4792

INTRODUCTION ** 1

This memo is directed to the Principal Investigator (in his site-manager capacity) of each ARPA Project that is or will be a participant in the NETWORK. It signals the opening of active service by NIC, the Network Information Center, and is aimed at launching a "Network Dialogue System" whose development and support will be our opening external activity. To this end I am hereby soliciting your help -- explicit, personal action. I would appreciate very much your thoughtful reading of this memo, and your prompt attention to executing these five specific steps: 1a

1. If you have questions, alternate suggestions, special problems, or uncertainties about proceeding with this scheme, please call me before going ahead -- (415) 326-6200, ext 2220. 1a1

2. Appoint your local Network Reference and Communication Agent. Have her call (collect) Jeanne North -- (415) 326-6200, ext 4119. 1a2

3. Appoint (re-appoint, verify ...) a Technical Liaison Contact between NET/NIC and your group. (You may wish to reconsider a prior liaison appointment in view of the newer role specifications given here.) Have your Liaison Contact call (collect) Walter Bass -- (415) 326-6200, ext 4372. 1a3

4. Set up a Network Reference and Communication Station for the Agent to run (at least in its simple, initial form: a place, a telephone, some shelf space, etc., within easy talking distance of the Agent). 1a4

5. Produce the most likely dates and plans you can for the following, and see that both your Agent and Liaison man know about them. 1a5

a) When your site will become operational on the Network (i.e. when you will be connected to the IMP AND have at least Teletype I/O protocol implemented in your monitor) 1a5a

b) When your R&C Station can be equipped with an on-line typewriter, what kind it will likely be, and what sort of accessability it will have to the Network (hours per day, days per week) 1a5b

SUMMARY DESCRIPTION ** 2

This Network Dialogue System involves two specially assigned people at each site, who are as soon as possible to be provided with an on-line typewriter at a specially designated "Reference and Communication Station." Beside the typewriter, the Station is expected to include a telephone, and certain hard-copy reference materials supplied by NIC. 2a

A Reference and Communication Agent should be on call at (or near) the station full shift, to handle communications, become a specialist in NIC usage, etc. (Assumedly she does other useful work for you otherwise -- at the Station.) NIC will supply her with training and reference materials for these services, and will educate and assist her as fully as is possible via the remote communication linkage. 2b

I would judge that the maximum, Agent-duty demand on her time would be as follows: About a day per week until she gets her on-line typewriter. For the following several weeks, perhaps 2 to 3 days/week for a learning-practicing surge as we teach her how to do some NIC things with it. Thereafter, perhaps a day a week for a few weeks (tapering off to half a day) plus whatever load your staff puts on her for coaching and reference support, and whatever communication activity occurs in and out of your node -- this could becme as much as a half-time job if your group becomes reasonable active. 2b1

Your group's NIC Liaison Contact is to be generally available to the Agent for technical backup. He would be one of your technically oriented people who is used to learning on-line techniques, who understands at least enough of the different Network-technology facets to interpret technical questions accurately and to pursue their answers intelligently. He is also expected to field technically oriented questions and requests from other Network sites. Both people will become useful sources of Network folklore etc. for your local group. 2c

I would judge that the maximum, Liaison-duty demand on his time would be as follows: About a day and a half (total) before he has Network access through a typewriter. For the following several weeks, perhaps 3 days (total) to reach a basic familiarity with NIC-supported systems (enough to give local counsel to the Agent). Thereafter, somewhere between an hour and a day per week (depending upon your site's Network activity) to keep in touch with NET/NIC progress and folklore, to support your local Agent, to field special technical queries about your site, etc. 2c1

At least for the next three months, we will maintain a NIC telephone system that provides toll-free service, especially for your Agent and Liaison man although usable by others (but we'd rather concentrate on dealing with these two special people). The system will have a commercial, after-hours answering service, and will be responsive to special needs around the clock. Jeanne North is anxious to get acquainted with the Agents, to help them understand the NIC plans and Agent roles, and to help them learn things such as how to use our services, how to get help from us for things they don't know how to handle, etc. Walter Bass will serve similarly for the Liaison man. We are willing to invest rather heavily in personal contact with these two people for your site, assuming that they in turn will generally handle personal-contact questions and problems with the rest of your staff. 2d

CHOOSING THE REFERENCE AND COMMUNICATION AGENT ** 3

We envision a secretary, computer operator, or the like -- who has other work, but is available to be interrupted for the stipulated reference and communication tasks. She should of course be an accurate, proficient typist. Besides being capable of learning user protocol and becoming a skillful operator of query, editing, and communication subsystems, she should be a steady, usually-there, support-type person. These attributes are more important from our point of view than having special training such as for librarian, programmer, or computer operator -- we want an active agent, and expect to train her. 3a

It would be useful if she has an alternate or two. After the Agent gets to know the ropes, she should show some backup types how to do some of the more straightforward things. We'd advise her about the essentials to be taught. 3b

LOCATING AND OUTFITTING THE R&C STATION ** 4

Its location should be central to the main participants of the ARPA Network. 4a

A telephone that is ringable at all hours is a must. It needn't be for the sole use of Network calls, but it should be generally available for this purpose. Part of the reference information NIC will maintain at each station will be the list of R&C-Station phone numbers for all the Network sites. (For similar purposes at our site, we have come to use special direct-dial phones; you might consider doing likewise.) 4b

As soon as possible, an on-line terminal should be made available, to which the activities of the Station have first priority, and which has (as near as possible) full-time two-way access to the Network. Two-case printing is desirable. Faster printing (than 10 ch/sec) is valuable. A TTY37 (15 ch/sec) is the most straightforward recommendation. A G.E. Terminet (30 ch/sec) is fast and has the extended character set, but we find that ours makes smudgy pages and doesn't feed reliably. Pin-feed platen very handy -- we are partial to using roll-paper stock with tear perforations for 8 1/2 x 11-inch, 3-hole-prepunched pages (nice, documentation-grade printout is thus obtainable). 4c

Having use of a separate "receiver" printer would be very valuable; having it right there is best; having it only reasonably near (e.g. a two-minute walk) is useful, but not at all the same. Even a special Receiver Typewriter would be worth a good deal -- we have quite reasonable provisions for transmitting upper-lower cases from a TTY33 if using an economy-model Transmitter Typewriter associated with a good Receiver Typewriter is of economic interest to you. We are prepared to interface to a reasonable diversity of different devices. 4c1

A "place" is required to hold hard-copy reference information; NIC will supply the information. (Initially only a few feet of shelf space need be provided, but this will likely expand with time.) 4d

It would be desirable to have a reading area in the near vicinity (like a chair and a table) -- people will assumedly be wandering up from time to time to look over the reference material. Eventually, space will be needed for a microform viewer. 4e

SOME REMARKS ABOUT NIC PLANS AND SERVICES ** 5

We see NIC's primary role in the Network experiment as providing a support service for Network participants: tools, techniques, and services of computer, storage, and people. We aren't to be policy setters, and the feature of using computer tools to provide the service is considered secondary to doing information-service things that will best support the experiment. We aim eventually to provide highly interactive, exotic information services that will be very valuable to a dynamic clientele, between and with whom we hope to facilitate highly responsive dialogue. But basically we can only serve as a supporting agent toward these ends; for these things to

emerge in a significant way, it will require active involvement of Network participants both in Network kinds of activities and then with NIC as it learns how to serve their information needs. Some of the services we will provide are: 5a

Collection and storage of a wide range of Network-relevant reference information (in the NIC Master Collection). 5a1

On-line service over this collection for querying, browsing, and retrieving -- designed to serve a range of terminals (typewriters to CRTs). A coordinated set of off-line reference materials (indices, etc.) will also be available. 5a2

A communication service in which there will be direct, interactive and sophisticated handling of messages -- their composition, delivery, verification, storage and retrieval (they become part of the master collection). 5a3

A natural means for linking messages to each other, and to any other items in our collection, to produce an organically developing network of dialogue items whose search, study, and integrative manipulation will be supported by our computer aids as a basic NIC service. 5a4

A computer-aided support service for documentation development and publication, with a full range of symbols, fonts, graphical constructs, and eventually half-tone pictures. 5a5

A support service for individuals and groups who want to develop private retrievable collections -- sharing or not all or some with others (including the NIC collection). 5a6

(We are heavily involved in preparing ourselves toward these ends, both in range of services and in capacity to handle customers. It is quite evident that these ends will be reached only by steady evolution, throughout the range of site facilities, supporting technologies, user methods, user skills, and "NIC knack.") 5a7

Some specific examples of expected NIC services: 5b

Consider the documentation that a given site may have on its special subsystems: suppose that this documentation is stored by them in their own computer-held text files. We will offer to catalog and index such documents, so that other users could learn of their existence and location

doing retrieval searches through our catalogs. We'd then offer an automatic service where NIC retrieves the source text from their storage places, formats (character converting, etc.) for your printer, and produces for you on your printer a full copy of their document as cited in our catalog/index files. 5b1

A catalog of Network resources will be basic: 5b2

Resources at each site: hardware, compilers, sub-systems, etc., with attributes indexed for search and analysis, etc. 5b2a

Reference material describing the user-level protocol for each site will be kept organized and made available -- e.g., the "system manuals" for users who will be looking at the systems through the Network. 5b2b

A roster of people associated with Network activity. In the beginning, listing of a person other than one with an official assignment will be done only in response to a request by him to be listed, and the information cited about him will not include anything he didn't volunteer. We can record some of his main interests, activities, plans, or etc., so that others can use the search and retrieval tools on these records to find collaborators or information sources. Phone numbers, mailing addresses, etc. would also be included. 5b2c

(With help from your Station Agent and Liaison Contact, we should be able with a minimum of fuss to keep you aware of what information other people seem to need about your site. They will be trained by us to make it easy for you and your technical staff to provide and keep updated such information. Also, what your people find lacking in other's documentation will be relayed by them through us to those who best can fill the lack. We're aiming to reduce needless fuss, sweat, worry, labor, etc. but yet try to evolve really useful information.) 5b2d

GENERAL DISCUSSION ABOUT THE "NETWORK DIALOGUE SYSTEM" ** 6

To provide a useful initial service to the Network Community, and also to give our evolutionary process a starting place, we recently adopted the initial-stage design described herein for a startup dialogue system. (Heretofore, I had a great deal of

trouble trying to find a good way to get NIC into the business of serving customers.): 6a

We will support a "Network Dialogue System." The nodes will be the various research sites. The links will be whatever communication means can be best used at the moment -- mail, telephone, and the ARPA Network as it becomes more and more functional. 6a1

We have direct service in mind, of course, for and between arbitrary (interpret to your liking) individuals at the host sites. 6a1a

But one realizes that in any proper Network there must exist a certain amount of mystique and folklore, lumped esoterically under the term "protocol," whereby the signals and messages and requests and receipts and over-due notices etcetera are taken care of. 6a1b

To accomodate protocol with minimum burden to network users, in designing our Network Dialogue System we have emulated the most highly developed of today's network designs -- much of the underlying protocol is to be handled at each site by a uniformly designed impish "processor" whose local-user interface represents a reliable, uniform, and simplified level of protocol and service. The "IMPs" for our Network Dialogue System will be people -- the Station Agents. 6a1c

We therefore ask that there be appointed at each site an Agent, to be provided with a location, working space, time, attention, and facilities to serve in the following way: 6a2

She will know how to use our NIC services, e.g.: request special information; transmit personal messages; submit information for NIC storage and dissemination; make use of specially provided hard-copy reference material; notify authors regarding errors and omissions; and get local printouts of NIC files. 6a2a

She will help the NIC with local services performed in our behalf, e.g.: seeing that messages are delivered to local people; helping people learn how to use NIC services; updating locally held, hard-copy, NIC reference material (according to instructions and materials supplied by us); helping local users find needed information among the various hard-copy materials that will comprise an important part of our early

services to your locale; and providing feedback to us about needs and possibilities for improving our services. 6a2b

There are various particular features to mention about your local support for the Station Agent -- however well you can manage it, with time, space, encouragement, etc. 6a3

In particular, she will need a certain amount of consistent, supportive help in learning about technical details associated with some of these tasks -- we'd like your Liaison Contact to provide this (thus helping to form a working team, with whom we can work consistently, and about whom you can feel comfortable about handling the reference and communication aspect of your total "Network interface"). 6a3a

Also, relative to the Agent's on-line terminal -- we will give a good deal of attention to teaching her how to use it for reference and communication purposes, if you see to it that she can readily link to us through the Network. 6a3b

As indicated above, I have been plagued for many months by the question: How do I launch a new, experimental service for a clientele that I don't see or hear, where the service is designed for a degree of computerized communication that hasn't yet emerged, but where it is disturbingly apparent that the proper performance of our declared function could significantly accelerate that emergence? What is needed badly in order that we at NIC can produce some service, and also I think in order that the Network can become a live, viable activity, is for a sizeable amount of stimulating and visible dialogue to take place. To this end, I have recently decided to dedicate most of the NIC-service energy over the next few months toward stimulating and supporting such visible dialogue -- which is the reason for the "Network Dialogue System" development. 6b

By "visible dialogue" I mean messages and memos that become a public record available to all potential Network participants, for later reference, citation, retrieval, or browsing through; where other people than those involved in a given exchange are welcome -- and helped -- to discover its existence and contribute questions and additions that in turn are incorporated as part of the recorded dialogue. 6b1

For instance: This memo is already entered and stored for

such future use. You won't have to worry about keeping it for some possible future need -- NIC will have index and query hooks on it, and will have on-line and off-line search and access means for your Agent (or you) to locate and acquire another copy. On-line "citation jumping" will provide direct access from any later memo or message that cites this memo, right down to the paragraph level. For instance, (4792,6b2) is the citation that links to this particular paragraph of this particular memo, and an on-line Jump-Link call on any occurrence of such a citation will hereafter yield guaranteed full-text access (in from a few seconds to a few minutes, depending upon usage, aging, etc.). 6b2

We are set up to handle the transmission/distribution of such material as submitted to us, and to provide storage, indexing, retrieval and access to the accumulated material -- in hard-copy mailed media and/or by on-line access, whatever it takes to get things rolling. One-sentence messages, very informal memos, tentative plans, "CQ calls" seeking support or interaction, announcements of up-down-changes or etc., arguments about how things should be done -- telephoned to us, mailed-in long hand or typescript, composed via Network access to our on-line editing system, sent or transmitted as a file composed on your editing system -- we'll try to handle them all. 6b3

As soon as your Agent is ready, we will supply her with reference material describing these services, and instructing her as to how she can make them immediately available to your group. 6b4

To help get this dialogue-support system working, and then to stimulate the growth of relevant dialogue, I would appreciate very much your continuing concern and help over the next few months. Encouragement of your staff's participation, surveillance and support of their contributions, and your own dialogue contributions (your Agent can soon enter them for you) will all be important. 6b5

We are basically ready to provide on-line interaction, in typewriter mode, for initial experimentation, for editing, for access to dialogue material, etc. (holding off on more general reference-material access for the time being). Until we get established with our network of Station Agents and Liaison Contacts, we'd prefer not to carry simultaneously the complexity of breaking in the on-line service and its new users. We'll plan to open the service on Nov. 2. Your Agent

Will be supplied with the reference information necessary to link to us and experiment, and she and the Liaison man will be the first we offer to check out on it. They will (we hope) then check out other users. 6c

One of the technical matters about which we particularly want to stimulate (and participate in) an active dialogue has to do with transmission, queuing, printing, delivering, etc. of messages and documents. I invite you to get your thoughts in order regarding your needs and interests in these matters, and standby to participate soon in our "visible dialogue." 6d

I hope that you will be able to give prompt attention to the execution of the steps under Branch 1 above. I personally have been developing a steadily increasing appreciation for the potential value of the ARPA-Network experiment, and it would please me greatly if, as others might come to feel similarly, we at NIC could help support the level of dialogue that the experiment needs. .REL=1; 6e

MAILING LIST -- Network-Site Managers: ** 7

Dr. Daniel Bobrow 7a

Prof. T. E. Cheatham, Jr. 7b

Dr. Douglas C. Engelbart 7c

Prof. David Evans 7d

Mr. James Forgie 7e

Prof. Edward Glaser 7f

Prof. David Harris 7g

Prof. Leonard Kleinrock 7h

Dr. J. C. R. Licklider 7i

Prof. John McCarthy 7j

Prof. Alan Perlis 7k

Dr. Lawrence Roberts 7l

Dr. Charles A. Rosen 7m

Memo: SETTING UP A NETWORK DIALOGUE SYSTEM - NIC 4792

Prof. Daniel L. Slotnik 7n

Mr. Keith Uncapher 7o

Mr. Clark Weissman 7p

:4792, 01/14/71 1159:25 MEJ ; .DPR=1; :4792, 10/01/70 1441:12 DCE ;
.DSN=1; .RTJ=0;
A few additions and editing changes from 4791 (1a1, 2b1, 2c1, 4e, 6e), and some material (2d, 5) that Larry wanted added; .DPR=0;

1

4800 WSD 2 AUG 70
Comments on NETWX THINKPIECE(see--NIC,5555,)

Doug....here are comments. They are a little ragged, and not well thought out. In general, I felt that the design satifies a lot of needs which I had to think about for a while to realise. I would worry about them not being obvious to a non-ARC person.
WSD

4800 WSD 2 AUG 70
Comments on NETWX THINKPIECE(see--NIC,5555,)

The system proposed seems sound and well thought out. I have the following comments:

Some of the justification for having a system no like the one currently provided (with teletypes between IMPs) is not obvious. at first glance. I had to think a bit before I realised that on could not guarantee the arrival of a document in coherent form with the current system.

I would favor using the site name (e.g. SRI, UTAH, UCLA, MAC, etc) for destination codes (see--nic,5555,3a4a)

I didnt see a mention of the possibility of multiple links. I should think that this would be especially important to the NIC, insofar as we may well have a need to broadcast messages.

The multiple line concept strikes me as being complex.

In particular, I didnt understand the significance of the 9 local incoming lines an | output(nic,5555,3c3a|)

If I read it right, the intent is to provide a system whereeby an operator may interrupt a process in a coherent place, proceed to one or more other processes, and then return to the interrupted process.

My interpretation of this section is that you are providing what is essentially (functionally) a service similar to that of a telephone call-director.

If this is the case, then I remove my objection about complexity

I think that we should consider (realistically) time frames.

I seriously doubt that a system of this sort could be designed and implemented and distributed in less than 6 months time (elapsed).

We should make a guess as to when future sites on the network will really become operational (Which depends upon God knows what), as compared to the estimated implementation time of the system, as compared to the expected system down time.

I guess that the answer may be that the proposed system is not intended to be interim, but rather a permanent solution to an

ongoing problem. 3c

On the other hand, it may beargued that the purpose of the network is to attempt to accomplish things like the NIC and inter-site communication via the HOST computers. 3d

The result of the preceeding statments is that I am ambivalent 3e

```
!:4800', 08/04/70 1025:26 WSD ; TO DCE, FROM WSD  .HED="4800 WSD 2 AUG
70
Comments on NETWX THINKPIECE(see--NIC,5555,)";
.SNF=72; .MCH=65; .DSN=|; .LSP=0; .RTJ=0; .PGN=0; .DPR=0;
```

1

Memo to Arc concerning initial Journal system. 2

A preliminary version of the Journal system is now available. The intent is to provide a system whereby documents may be conveniently stored, catalogued, and accessed. Any type of document may be submitted to the Journal, the main criteria being that it be available for all ARC personell, and that it be relationship to some ARC purpose. 3

Examples of documents suitable for entry to the Journal are: 4

ARC memos 4a

Design specifications and related documents (including working design documents, i.e. the intermediate documents as well as the finished design should be candidates for Journal entry) 4b

Written communications which have some significance. 4c

Any other documents of note. 4d

Documents in the Journal will be available to all ARC users, and may be referenced by accession number (which is assigned when the document is entered into the Journal) anywhere within the ARC environment. 5

An access collection of all journal entries will be located ???. 5a

Feel free to mark comments on the documents located there. 5b

Please don't remoove the documents for a long period of time. 5c

In order to submit a document to the journal, simply leave a permanent copy of it in your colon file space, with the first letters of the name being ':JRNL', e.g. :JRNL|. 6

Someone will then enter it into the journal, and delete it from your colon file space. 6a

You may, if you wish, provide information relevant to the document in the header statement. 7

SOURCE ::= "From " INITIALS 7a

DESTINATION ::= "to " $(INITIALS/GROUP/ROLE) 7b

If a destination part is included, then the document will be distributed to the designated persons. 7b|

A GROUP is essentially a distribution list, such as ARC, NLS-USERS, etc. 7b2

TITLE ::= "Title " '" STRING '" 7c

Any .HED directive in the origin statement will be taken as the title if there is not an explicit one. 7c|

```
':480|', 08/04/70 |034:20 WSD ; WSD to ARC     .HED="480| WSD 3 AUG 70
Initial Journal System"; .SNF=72; .MCH=65; .DSN=|; .LSP=0;
.RTJ=0; .PGN=0; .DPR=0;
```

```
.SNC=72;
```

4803 DCE 3 AUG 70
Initial Journal System

Memo to Arc Concerning initial Journal system. 1

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A hard-copy access collection of all journal entries will be located on the shelves at the north end of the ARC work area. 4a

Feel free to mark comments on the documents located there. 4b

Please don't remoove the documents for a long period of time. 4c

In order to submit a document to the journal, simply leave a permanent copy of it in your colon file space, with the first letters of the name being ':JRNL', e.g. :JRNL|.Someone will then enter it into the journal and delete it from your colon file space using the following procedure: 5

(1) Make a copy of the file in Journal scratch using the appropriate accession number as file name. 5a

(2) Format the header statement to conform to Journal standards. 5b

(3) Add directives which cause the document to be printed in a

standard Journal format. 5c

This memo is an example of a document in the initial Journal format. 5c|

(4) Make hard-copy versions of the document and enter them into the master and access Journal collections. 5d

(5) Distribute the document (if a destination is indicated -- see below). 5e

(6) Archive the Journalized NLS file. 5f

The maintenance of Journal archives will be the responsibility of the Journal support staff. 5f|

(7) Delete the original file from your colon space. 5g

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```
:4803, 08/04/70 |057:58 WSD ;:JRNL|, 08/03/70 |946:0| DCE ; From DCE to
WSD     .HED="4803 DCE 3 AUG 70
Initial Journal System"; This file is 4802 as edited by DCE
.SNF=72; .MCH=65; .DSN=|; .LSP=0; .RTJ=0; .PGN=0; .DPR=0;
```

4804 WSD 4 AUG 70
Initial Journal System

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Please don't remove the documents for a long period of time. 4c

In order to submit a document to the journal, simply leave a permanent copy of it in your colon file space, with the first letters of the name being ':JRNL', e.g. :JRNL|.Someone will then enter it into the journal and delete it from your colon file space using the following procedure: 5

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TITLE ::= "Title " '" STRING '" 6c

Any .HED directive in the origin statement will be taken as the title if there is not an explicit one. 6c|

```
:4804, 08/04/70 ||05:|3 WSD ; ':JRNL2', 08/04/70 |0|6:47 WSD ; From WSD
to ARC     .HED="4804 WSD 4 AUG 70
Initial Journal System"; This is 4803 as re-edited by WSD.
.SNF=72; .MCH=65; .LSP=0; .DSN=|; .LSP=0; .PGN=0; .DPR=0;
```

4805 WSD 4 AUG 70
Memo Concerning Initial Journal

Doug and Walt... |

I got the note concerning file crash. Thank you for fixing up the file again. |a

The file which you fixed up I have made journal entry #4803, and I would like to have MIL or someone modify 480| so that it looks like the copy of 4802 which I gave you last night |b

I want to do this because 4802 had been entered into the journal, and I think that for a while, at least, we should be strict about the read-only nature of files which have been entered into the Journal. |b|

I have made a few changes to 4803, and that has been entered into the Journal as 4804, which I propose to distribute to ARC with your agreement. |c

The main content change is that I deleted ROLE from the list of possible destinations. |c|

Concerining the Journal header format, I have found that by inserting ", DUMMY ;" as the first thing in the origin statement, the original file header becomes part of the header text. I propose to do this as a standard way of preserving that information upon journal entry. The header of this document and 4804 have been done that way. |d

I will wait for your comments before distributing 4804. I want to get it distributed today, so haste would be appreciated. |e

WSD... 4 AUG 70, ||30 |f

|

```
':4805', 08/04/70 ||38:22 WSD ; ':JMEMO', 08/04/70 ||35:09 WSD ;
.HED="4805 WSD 4 AUG 70
Memo Concerning Initial Journal"; From WSD to DCE and WLB.SNF=72;
.MCH=65; .DSN=|; .PGN=0; .DPR=0;
```

4806 WSD 17 JUL 70
Brief Description of Interim Index/Catalogue Generation Scheme

Overview:

A special subsystem - CUTILITY - will be used for manipulating catalogue files, and utilising a new feature in NLS/TODAS (The collector-sorter) to make sub-collections and indices from catalogue collections. |a

Cutility will behave as a user at the Executive level, and will be able to perform the following basic functions: |b

(1) Read/write files to and from KDF. |b1

(2) Creation, deletion, and general Executive level manipulation of scratch files. |b2

(3) All functions provided by TODAS, but with the qualification that as the function becomes more interactive, the task becomes more difficult. |b3

Cutility will be able to perform these functions on a set of files which have been described to Cutility previous to use. The number of files in a set is currently limited to 30, but this number may easily be increased. |c

The collector-sorter. |d

The collector-sorter will have the same relationship to NLS as TODAS, that is, it will appear as a processor with access to all of the NLS mechanisms. |d1

Note that this is a step in the direction of the "Core NLS" system which wwe would like too someday have. |d1a

The C-S may be called from either NLS or TODAS, and will (probably) work in one of the following modes: |d2

(1) C-S will interact with the user with its own command language, and appear to relate to NS much in the same manner as the calculator does now. |d2a

(2) NLS/TODAS will obtain sufficient informatioon from the user previous to calling C-S, and C-S will be a non-interactive processor.. |d2b

(3) C-S will read commands from an NLS statement or

branch, much in the manner of executable text or ??? |d2c

DCE likes this alternative best |d2c|

The flow of execution in the C-S will be roughly as follows: |d3

(|) User specifies content analysis/ statement formatting pattern, and compiles it. |d3a

If a sort is to be performed, then all sort keys must be created and moved to the front of the statement, immediately preceded by a "*". |d3a|

A sort key is defined as the string of visable characters immediately following the '*, viz. "$NP '* $PT", where $PT is the key. |d3a2

Any number of sort keys may be provided, and their precedence will be equivalent to their sequential order. |d3a3

Thus, a set of sort keys may be (roughly) described by the pattern: |d3a4

$($NP '* $PT) |d3a4a

(2) A list of file names is provided to the C-S, and it proceeds to load the files, and extract (using the sequence generator) all of statements which pass the pattern. |d3b

(3) All of the extracted statements are placed in one large file (without a structure), and a table (or vector) of pointers is created so that there is one pointer for each statement in the file. |d3c

The statements are stored in a manner such that the date and initials of creation are preserved. |d3c|

(4) When all of the input files have been perused, the resulting file of extracted statements is sorted according to any keys which are present. |d3d

The collating sequence is equivalent to the (ascending) numeric order of the SDS 940 character set. |d3d|

The file will be sorted using a tree sort algorithm (there are some described by Floyd in CACM, circa 1966), and only the vector of pointers will be sorted. 1d3d2

The tree sort has the advantage of allowing much of the sorting to be overlapped with input and output of entries to and from the file. 1d3d3

(5) The resultant (sorted) file is then output to a set of destination files, with a maximum of 1829 statements in one file (90% of maximum size). This allows some room for editing and expansion of generated files. 1d3e

As the statements are output to the destination files, all sort keys are stripped off (perhaps this should be under usr control???) 1d3e1

Description of Tasks. 2

(1) Write Cutility. 2a

This will be a derivation of the subsystem Nutility, and a minimal version will require approximately 3 days of WSD time. 2a1

(2) Modify Content Analyzer, and add further to NLS. 2b

I estimate that this task will require from 3 to 6 weeks of programmer time as follows: 2b1

DIA	1 - 2 weeks	2b1a
CHI	1 - 2 weeks	2b1b
WSD	1 - 2 weeks	2b1c

This modification to NLS is described in the memo by CHI dated July 2, 1970, and titled "Proposed New Feature". 2b2

(3) Write Collector-sorter 2c

This is a fairly large task, and the following should be considered a rough estimate: 2c1

(1) Design functional and user specifications: 1 week 2c1a

(2) Design NLS interface, and outline implemetation: 1 week 2c1b

(3) Implement first phase, of command parsing, statement extraction, and output phase: 2 weeks 2c1c

(4) Implement sort: 1 week 2c1d

Total: 5 weeks 2c2

CHI thinks that this is too little time, and I (WSD) tend to agree, so call it 6-8 weeks

2c2a

Further Work Which May Be Done. 3

Ther seems to be a potential of expansion in the area of using the Collecter-sorter interactively, on a level parallel to NLS. 3a

There will be a class of evolutionary modifications to be made, as the Project continues. These changes could (easily) double the time required for any task. 3b

3c

Estimate of design Effort. 4

In order to adequately design the system, and avoid slippage as much as possible, a minimum of 1 man week should be devoted to the overall design, and it should involve all relevant parties. It will be necessary to limit the design so that the above time estimates are not invalidated, except in cases where an unacceptable condition is encountered. 4a

':4806', 08/05/70 |0|8:38 WSD ; :INTIR, 07/|7/70 0900:43 WSD ; From WSD To DCE .HED="4806 WSD |7 JUL 70
Brief Description of Interim Index/Catalogue Generation Scheme";
.SNF=72; .MCH=65; .DSN=|; .PGN=0; .DPR=0;

4807 WSD 5 AUG 70
Convention for handling bad files submitted to Journal

When a bad file is encounteder as a Journal candidate, I propose that we folow the following procedure: |

Change the file name so that the prefix is ':BADJRNL... rather than ':JRNL... |a

Provide a negative acknowledgement to submitter, and ask that he re-submit file when it is patched up. |b

Continue to assign numbers to successive Journal candidate files as though the document had not been entered. |c

I fully realise that this is not the most conservative method of treating these files, and has many bad points (in fact, I don't particularly care for the scheme myself). 2

I feel, however, that it is the most practical INTERIM method. 2a

I fully advocate replacing it with a more suitable method when we get both feet on the ground with the journal. 2b

':4807', 08/05/70 2339:30 WSD ; ':BADJRNLFILES', 08/05/70 2335:33 WSD ;
From WSD to DCE, Journal .HED="4807 WSD 5 AUG 70
Convention for handling bad files submitted to Journal"; .SNF=72;
.MCH=65; .DSN=|; .PGN=0; .DPR=0;

4808 WSD 5 AUG 70
PRELIMINARY SEPCIFICATION OF MAIL SYSTEM WITH AUTOMATIC JOURNAL E
TRY

Overview |

Capabilities |a

The mail subsystem will allow a user to send and delete messages automatically, without using QED. |a|

All messages will be automatically entered into the journal , assigneda journal number, and be available for normal journal reference. |a2

A lock mechanism will prevent the loss of messages due to two persons entering messages at the same time. |a3

The mail system will automatically add a header to each message which will contain: |a4

Journal number and message number (sufficient for identifying the message in the journal) |a4a

Initials of sender |a4b

Date and time message is sent |a4c

Description |b

Send Function |b|

A message is submitted to the mail system as a QED file. |b|a

Note that the file may be created in NLS or TODAS, and then be converted via Output Device QED. |b|a|

A message number is assigned, which has the format: JJJJ.NNNN. |b|b

JJJJ is the number of a Journal file which will contain the message. |b|b|

NNNN is the statement numbeer of the message in the file. |b|b2

Initially all of one days messages will go into one file, so NNNN will be set to | each day. |b|b3

In referencing NNNN, leading zeros will be deleted. |b|b4

The message is reformatted according to the description in (|a5:wg) above. |b|c

The message is finally written onto a permanent journal collection file, and the current message file. |b|d

Delete function |b2

The user may ask that either all messages to him be deleted, or that a specific message (referenced by number, see--|b|b:wg) be deleted. |b2a

His initials are then removed from the destination field in that message in the message file (not the journal file), and the message is deleted if there are no other addressees. |b2a|

Entry into Journal |b2b

At the end of each day, the journal collection file is copied to a QED file,which may be input to NLS via insert QED. |b2b|

The resulting file is entered into the journal, and a new journal collection file is started, with a new journal number, and NNNN set to |. |b2b|a

NLS Compatibility |b2b2

The Mail subsystem should be viewed as a stepping stone in the direction of a mail system which is fully integrated into NLS. |b2b2a

The following steps might represent a reasonable evolution towards this end: |b2b2b

The separate mail subsystem (as described in this specification) |b2b2b|

The mail system described here made into a processor for NLS in the manner of PASS4 (e.g. Output Device Mail) |b2b2b2

Conversion of the mail files to NLS file format, and the inclusion of the mail system as

a super processor in the manner of TODAS or the Collector-sorter |b2b2b3

The establishment of individual mail files in NLS format, and a suitable set of commands to manipulate them. |b2b2b4

This may be done via an extended super processor, in the manner of the calculator or??? |b2b2b4a

User Commands= 2

Normal Commands 2a

Send 2a|

Syntax: Send FILNAME . 2a|a

Semantics: This indicated file is read by the mail sustem, and is checked for syntactic corectness 2a|b

If there is not a terminating '$, then one is assumed at the end of fle 2a|b|

If the message is OK, then it is reformatted (with a header added) and sent to he mail and Journal collection files. 2a|b2

The message number (JJJJ.NNNN) is typed on the controling teletype when the message has been successfully dispatched. 2a|b3

Delete 2a2

Syntax: Delete MeSSAGE-NUMBER . 2a2a

Semantics: Asearch is made of the mail file for the indicated message. 2a2b

If it is found with the users initials in the destination field, then the users initials are deleted, and the message is deleted if it is addressed to no-one else. 2a2b|

Note that the journal collection is not altered by this command. 2a2b2

Compute the new message number, and store it into meschk. 3a|c

Read the message and format it into a buffer area (mesbuf) : 3a|d

Insert message number in format: JJJJNNNN 3a|d|

This will serve as a statement number for inseet QED, in addition to being used for location message. 3a|d|a

Scan for '$, discarding anything which is not 3a|d2

Initials 3a|d2a

'- 3a|d2b

'(3a|d2c

') 3a|d2d

Build header and copy into mesbuf after first '$. Terminate header with a CR. 3a|d3

Copy message into mesbuf, terminating at '$ or |37B (EOF). 3a|d4

Write two CR's after message for Insert QED. 3a|d5

Copy formatted message from mesbuf to end of JCF, starting at the previous end of file in the JCF. 3a|e

Close message input file 3a|f

Update nmess and eofptr in file header (see -- filhed:). 3a|g

Open mail file 3a|h

Copy message from mesbuf to end of mail file, and update header in mail file. 3a|i

Close mail file 3a|j

Set meschk to -|. 3a|k

Close journal file 3a|l

Format of scan table: 3b3c2

word 0: File block no. (256 word/block) 3b3c2a

|: Word no. within block 3b3c2b

2: Chr no within word (0,|,2) 3b3c2c

A=2 3b3d

Read position.. returns position of next character to be read from scan table for file in X 3b3d|

writch 3b4

Write a character onto random file and increment 3b4a

A=0: 3b4b

Write character to file indicated by X. Character passed in B. Increment character pointer in scan table 3b4b|

A=| 3b4c

Set position...Same as in redch 3b4c|

A=2 3b4d

Read Position...as in readch 3b4d|

A=3 3b4e

Write EOF 3b4e|

Writes |37 characters into last word, and outputs block to file. 3b4e2

Returns position of first EOF chr (|37B). 3b4e3

seqinc 3b5

Reads a character from sequential file. Returns '$ first time |37 (EOF) is read, calls filerr if called again. 3b5a

A= file number 3b5b

Returns character in A 3b5c

deblnk 3b6

Accepts parameter in A, and file number in X. 3b6a

If A=0, random file, A=|, File = sequential 3b6a|

Reads characters from indicated file until a non-space character is encountered, and returns character in A. 3b6b

Space characters are: CR (|55B), LF(|52B), Multiple space (|35B, count), space (0B). 3b6c

rdinit 3b7

Read initials 3b7a

Accepts parameters same as deblnk 3b7b

Scans file for initials (3 alpha characters), and returns when it has found initials (skip return) or encountered a non-space, nonalpha character. 3b7c

It always returns last character scnned in A 3b7d

opnrf 3b8

Opens a random file, given: 3b8a

A = address of file name string (no. chrs, name) 3b8b

Opens the file, and assigns it an internal number. 3b8c

Reads the file header into a file header area, and checks the checksum 3b8d

Stores the address of file header into scan table, and initials scan table to 0 character position. 3b8e

Skip return on success, with program file number in A 3b8f

No skip if fail. 3b8g

If file is busy, tries to open it 5 times, at 2 second itervals 3b8h

sethdr 3b9

Stores a value into the file header, and writes out onto file 3b9a

A = word in filheder 3b9b

B = value 3b9c

X=filenumber 3b9d

cksum 3b|0

Computes a checksum for 256 word block 3b|0a

Accepts address of block in A 3b|0b

dbi/dbo 3b||

Same as in NLS 3b||a

filerr 3b|2

This routine gets called whenever there hase been a serious file handling error. It does ??? 3b|2a

meshdr 3b|3

Accepts a string pointer in AB, and makes a message header of the format: 3b|3a

JJJJ.NNNN III DDMMMYY HHmm:SS CR 3b|3a|

Where: JJJJ = journal no. 3b|3a2

NNNN = statement number 3b|3a2a

III = initials 3b|3a2b

DD = day of month 3b|3a2c

MMM = month 3b|3a2d

YY = year 3b|3a2e

HH = hour (military, local) 3b|3a2f

mm = minute 3b|3a2g

SS = second 3b|3a2h

The message header is appended onto the string pointed to by AB. 3b|3a3

Returns with updated string pointer in AB 3b|3a4

mesnum 3b|4

This procedure converts the message number (in global cell mesnum) into alpha and appends it to the string pointed toby the string pointer passed in AB. 3b|4a

The X contains a flag controlling the insertion of a separator (.) between the JJJJ and NNNN 3b|4b

Returns with the updated string pointer in AB 3b|4c

dattim 3b|5

Converts the date time into alpha string (DDMMMYY HHmm:SS) and appends it to string pointed to by string pinter in AB. 3b|5a

Returns updated stringpointer in AB 3b|5b

initls 3b|6

Appends user initials to string pointed to by AB. 3b|6a

Returns updated string pointer in AB 3b|6b

fndmes 3b|7

Accepts a string pointing to a message number in AB, and searches mail file for that message. 3b|7a

Returns characterposition of first character past number of message, 0 if fail. 3b|7b

delini 3b|8

This accepts initials in the A, and deletes the initials from the message currently being pointed to by the file indicated by the X. It copies the file until the

initials are foound, and then scans past theinitials. If the messagge is addressed to no-one else, then it deletes the message also 3b|8a

The message or initials are deleted bu leving the read scan table pointing to the first character past the deleted part. 3b|8b

copfil 3b|9

This routine copies a random file to a sequential file. 3b|9a

The file number of the sequential file is in the A, and the X contains the program file number of the random file. 3b|9b

It returns normally if ok, otherwise calls filerr. 3b|9c

inchr 3b20

This is a routine which calls readch(0,,inchfn). 3b20a

inchfn is a global variable which may be set to any program random file number desired. 3b20b

It is intemnded to be used as a subroutine file, so returns with a BRS 4| and the character in the A. 3b20c

outchr 3b2|

This is like inchr, wxcept that the file number is in outcfn, and the A contains the cr to be output. 3b2|a

chkfil 3b22

This routine accepts the prog. file no. of a random file in the X, and checks the integrity of hat file, calling filerr if it is bad. 3b22a

send 3b23

This contains the calling sequence for send (see send logic flow) 3b23a

delete 3b24

This contains the calling sequence for delete 3b24a

```
':4808', 08/06/20 2|||:03 WSD ;':MAILSPEC', 08/05/70 |840:46 WSD ;
.HED="4808 WSD 5 AUG 70
PRELIMINARY SEPCIFICATION OF MAIL SYSTEM WITH AUTOMATIC JOURNAL ENTRY";
.SNF=72; .MCH=65; .DSN=|; .PGN=0; .DPR=0;
```

4809 HAL 5 AUG 70
FUNCTIONAL SPECIFICATION FOR PRIMARY TAPE ARCHIVE SYSTEM

Note---16 July 1970. 1

This report discusses features of the proposed Archive system which will serve as the first stage in the implementation of a dialogue support system. We envision a separate Jornal/Catalogue system which will make use of ARCH. Various implementation decisions have yet to be entered. 1a

Link to User implementation file---(archu,:) 1b

Link to File Directory---(fd,:) 1c

Environment 2

The Archive System (ARCH) will consist of two separate programs, a command queueing program (similar to Print) and a command execution program. It will place files in a safe repository (the archive) and will be capable of retrieving them on request. 2a

The Journal/Catalogue System will be a user of ARCH. Users of that system need not be aware of the existence of ARCH; calls on ARCH will be made by the system. 2a1

The queueing and execution programs communicate in much the same manner as the print and printer executer, i.e., through communication files. 2a2

The archive to tape execution program is expected to be run during hours of off-peak system usage. ***Whatever that means...possibly the archive files will be updated only at night (i.e., when an operator is handy) --- maybe when enough backlog is available. 2b

The software for ARCH may permit the implementation of a parallel system to serve as a replacement for KDF and permit direct access to files not in the user's colon space from NLS. 2c

Capabilities: 3

Archiving a File. 3a

This places the file on the storage device, and enters the file and pertinent information in a master archive directory (MAD). 3a1

A user should not be directly involved in the choice of device upon which his file is to be written. Among the information to be entered in the Master Directory will be an estimated activity level. 3a|a

If this level is above a level to be determined (perhaps dynamically) by system capabilities and use, the file will be written on one of the faster devices (e.g.,disc.) 3a|a|

The actual activity level, contained in the directory in the aging word, will be checked periodically by the execution program. If the activity is below the level for the device on which the file is stored, it will be rewritten on a slower device and the space on the faster storage device released. 3a|a2

Retrieving a file from storage device: 3b

This retrieves a file from an archive device, given an archive file name. 3b|

A user should not be concerned with which medium his file is on when requesting the retrieval of an archive file. 3b2

After his command has been parsed by ARCQ, the file directory is searched for its listing. 3b2a

A message is returned informing the user if the file is not in the archive. If the file exists and is on tape, the message informs the user of his position in the queue and an estimated time required for retrieval. If it is on the disc, no retrieval is required; only a location message need be sent to the user who may load the file through the use of its pseudonyms. 3b2b

If the file is on tape, a message is transmitted to the operator to mount the necessary tape. 3b2b|

Directory Print and Display. 3c

***We would have print and display commands for entire directory or for individual user's directory... no cataloguing here... just listing, location, status words, etc. ... display most recent on screen... by pushing any character except rubout continue through entire directory until rubout entered... print capabilities available... also record of last tape manipulations... receipt for

archival? Use of BEFORE and SINCE commands permits selective directory display. 3c|

Information retrieval and comments in J/C. 3c2

Linking. 3d

Linking would be handled in J/C. 3d|

Setting modes for a file. 3e

Accessibility--public, private, password. 3e|

Permanence--deletable, not deletable. 3e2

Deleting a file. 3f

Miscellaneous. 3g

At each run of ARCE, data indicating the status of the files manipilated and the outcome of the run is summarized as necessary in the directory space. 3g|

Implementation Concepts: 4

****This will be updated with a more detailed discussion of the divisions in parts of the system.**** 4a

Operating Environment. 4b

******Does ARCE operate continuously? Is it a separate system or a co-routine or what? When the operator enters does he enter ARCE or ARCQ? 4b|

The ARCQ will operate in essentially the same manner and environment as the current print program. 4b2

The ARCE operates in an environment which is similar to nutility. 4b3

This allows it to use all of the system features available for copying files, verifying files, etc. 4b3a

ARCQ, as presently envisioned, also needs many of these features. 4b3b

The ARCQ is a simple interactive command parsing program. 4c

It parses commands of the user, can return the user to EXEC, searches, displays, modifies, and maintains backups for the Master Archive Directory (MAD) and maintains flags in the directory to tell the Archive Executor (AX) which files are to be archived to tape. 4c|

It sets up and interrogates a communication file-queue and its backups used for passing on commands to the Retrieval Executor (REX) for retrieval of files from tape archive. 4c2

It can display receipts for the archiving procedure in the directory. 4c3

It immediately copies files into a disc archive space. 4c4

This is a set of several user blocks each with permanent groups of small files with names like (ARC|):A|, (ARC2):A2, etc., facillitating a larger amount of disc space for the archive than would otherwise be permitted by the TSS. 4c4a

We thus have the problems of having the user ARCH write into the space of several users and keeping this space read only to other users of the TSS. 4c4a|

If some space is released, the block is rewritten small again. 4c4b

The system must establish and keep track of the relationship between the names of the disc file space and the names used by the users for retrieval purposes. (Pseudonyms.) 4c4c

There will probably be two major sections of ARCE: the Archive Executor (AX) and the Retrieval Executor (REX). ARCE must be able to parse the commands and interactions of the operator. 4d

The Archive Executor (AX) used for placing files onto tapes. 4d|

When the operator wishes to archive files to tape he will enter ARCE with a command informing the system that he wishes to do so. The ARCQ will be closed to users for archiving and retrieval while the process is being carried out. MAD is searched and if a file is to be archived to the tape it will be. If, according to the aging word in the directory entry, a file is to be deleted from disc space because of little use, this will

also be done at this time. 4d|a

The last file copied onto the tape at each running of AX is the most recent MAD. 4d|b

Will these directories be linked? If so, how? 4d|b|

Is it in fact reasonable to copy directories over and over even if they change little? 4d|b2

What of the problem of putting two files with the same name on one tape? Won't we have overwriting unless we include dates in the name or something like that? 4d|b3

We must check the integrity of the files written on the tapes. 4d|b4

AX updates the directory entries with the location of the file on tape and changes the "File to Be Archived" flag. 4d|c

The Retrieval Executor (REX) used for retrieving files from tape. 4d2

ARCQ sets up a queue of requests for retrieval and sends this queue to REX through the communication file. 4d2a

The operator mounts the tapes as desired and interacts with REX to tell when tapes are ready. 4d2b

REX tells which tapes to mount on which device and copies the desired file into one of the archive locations on the disc. MAD is updated with the location on disc (pseudonym definition) and an instruction to dismount the tape is given. 4d2b|

If we handle file management through TSS we will do things this way. If we did not have the particular limitations of the system we could get around the necessity for pseudonyms, etc. 4d2b|a

REX is also used as a medium for reloading the system disc space after a serious crash. 4d2c

The communication file contains information concerning the availability of the operator to mount tapes; if he is unavailable for a particular length of time, this

information may be transmitted to the users of the system. 4d2d

There are two files used by the system; each has two back-up files to guard against system crashes. In addition there are blocks used by the system to store files on the disc. (The method of storage is tied to the requirements of the existing TSS file management system; changes are desirable, but probably not practical for the 940. We should make the system compatable with any future changes.) 4e

There is a communication file which is used by ARCQ for passing commands to ARCE-REX for retrieval of files from tape. 4e|

The format of this file is minimal, and the only problems are those of lock and file index marking. 4e|a

The file is random, with the basic physical block size being 256 (this block is programatically subdivided.) 4e|b

The first block is a header, containing pertinent information. 4e|c

A technique for providing lock is trivial, and consists of simply opening the command queue file for output, since the system allows only one user to have a file open for output at a time. 4e|d

There is a Master Archive Directory. 4e2

This file contains the identification of each archived file, and other pertinent information. 4e2a

It contains special bit patterns to permit checking the integrity of MAD entries. 4e2a|

Most information in MAD is not directly set by the user. 4e2a2

The contents of an MAD entry follow (total size---20 words): 4e2a2a

@@@@@Need to add flags for "File to be Archived", locatin on disc (pseudonyms). 4e2a2a|

&&&&&Must determine naming conventions for file. Linking of directories by having last

two directory entries on tape in current MAD? Delete entry of last eldest in set. 4e2a2a2

%%%%%%what about exact format????? 4e2a2a3

1. Name---10 words. 4e2a2a4

The name would be one by which the entry is listed in a catalogue in J/C. Pseudonyms and multiple name problems would be handled by J/C.&&&&&Really? 4e2a2a4a

We should have some naming convention to include date of entry and the name of the person who entered the file. 4e2a2a4a1

2. Aging (last date used and count record of use.)---2 words. 4e2a2a5

This is not directly set by the user. It would give information concerning the activity level of a file and would perhaps imply copying the file onto another device if the actual activity level is above or below the system limit. 4e2a2a5a

3. Description words---3 words. Probably need more space here... some files on both tape and disc. 4e2a2a6

Device---disc, tape or other. 4e2a2a6a

This would contain the tape number of the permanent archive file and would also contain a flag indicating whether the file is also on the disk. 4e2a2a6a1

If we have several Archive locations on the disc (to get around the size limitation on individual users) we will be required to include here a pointer to the proper disc file. 4e2a2a6a1a

We will want to use a set of files under, perhaps, users ARCH1, ARCH2, etc. with names A1, A2, A3, etc. The files will be small until written in and then made small again when space

is released. 4e2a2a6a|b

This will make possible a relatively safe set of disc files. 4e2a2a6a|b|

Access mode---public or private file. 4e2a2a6b

One could set this flag only for personal archive files. 4e2a2a6b|

Activity level estimate. 4e2a2a6c

This would be set by the user at the time of archival. It would be a number indicating the estimated number of retreival times per week for the file. 4e2a2a6c|

File type---sequential, random, NLS, etc. 4e2a2a6d

4. Size flags---| word. 4e2a2a7

Physical size. 4e2a2a7a

Maybe a checksum or something? The "size flags are to be used to give an estimate of retrieval time. 4e2a2a7a|

Access time. 4e2a2a7b

5. Status. (is the file presently in use in the system, i.e., is it being read out? If so tell the user. It would be unnecessary to write the file out twice.)---| word. 4e2a2a8

File to be archived (on tape) here. 4e2a2a8a

6. Directory work space---3 words. 4e2a2a9

Location of directory--on tapes, in colon space. 4e2b

Guarding against file loss from system crashes. 4f

The MAD and communication file will both have two back-ups to permit fairly secure directory spaces. 4f|

Whenever one of these files is to be modified it will modify the contents of the most recently written back-up (which should be itself) and copy it into the other

back-up. in the event of a crash, if one of the files is bad one of the back-ups is likely to be good. One would lose a minimum of information. In the event of a truly serious crash, the system may be reloaded from tape. (Perhaps we could get away woth only one back-up.) 4f2

Disc files will be written in space permanently assigned to the archive system in small blocks which are writen over when needed and made small again when released. 4f3

Needs of various user commands (from ARCQ). 4g

Finished-- 4g1

Just get back to EXEC. 4g1a

Eliminate name--
Set parameters for file--
Activity
General access
Owner access
General access
Password access
Removable name
Permanent name 4g2

Require directory access, modification. 4g2a

Print directory
Display directory
Location-- 4g3

Require selective (or complete) directory display or print after search. 4g3a

Order-- 4g4

Requires communication file search for location in queue. 4g4a

@@@@Receipt display-- 4g5

Must examine file directory to see location. 4g5a

Archive-- 4g6

Must set up directory entry--modify directory. 4g6a

Must copy into disc space--either permanent or temporary depending on activity level. Must keep track of pseudonyms. 4g6b

Retrieve-- 4g7

Must search MAD for entry; deliver message on location. 4g7a

If on tape and retrieval desired, must set up communication file-- place in queue, modify MAD (retrieval already requested flag.) Must be able to keep track of pseudonyms-- access files in disc space. 4g7b

Needs of various operator commands (from ARCE). 4h

Must check MAD and then copy files to tape, then reset MAD with location in AX. In MAD must get file off tape into disc archive space and reset MAD wit proper location--set up pseudonym. 4h1

Operator sign-in-- 4h2

Must let communication file know retrieval may be carried out. 4h2a

Operator log-out-- 4h3

Let system know when return expected to permit user to receive estimated retrieval time. 4h3a

Crash restart-- 4h4

Must give commands to operator to mount proper tapes to permit reloading of archive system. Reload directory form tape, Initialize archive space and then copy required files into blocks. 4h4a

Ready-- 4h5

Must be aware that command has been completed and then do what's right. 4h5a

Commands to operator-- 4h6

Must tell operator to mount tapes, etc. 4h6a

Interaction with the operator. 5

@@@@@Need discussion of possible human considerations --- just how will requests be transmitted to the operator and how will he respond to them. 5a

Commands and System Responses. 6

User commands. 6a

Entering the Archive System. 6a|

One would enter ARCH from EXEC by typing
@ARCH . 6a|a

####What abbout another name? 6a|b

(The underlined characters are typed by the user.) The system responds with a # in the command feedback line indicating that it is ready for the next user command. This procedure is followed after all user commands. 6a|c

Archiving a file. 6a2

Once in ARCH one could enter a file in the archive with the command
#Archive file--- <filename> (./,) 6a2a

If a period is typed the activity level will be assumed to be 0, the file will have private access, and the durability will be removable. If a comma is typed instead one may set parameters for the file to be entered as if the Set Parameters directive had been typed. Each additional mode may be termi nated with either a period (end of entry for this file) or a comma (more modes to be set). 6a2b

The activity level is used to determine whether or not the file in question will be copied on disc archive as well as on tape. If the estmated number is less than one the number 0 should be entered. An actual activity level will be contained in the aging word; it will be consulted periodically to see if some tape archive files should be copied onto the disk and if some disk archive files should be deleted. 6a2c

Set Parameters. 6a3

One sets parameters either when a file is to be archived by typing a comma rather than a period at the end of the

Archive command (i.e., after the file name) or by typing the command

#Set parameters for file <filename>. 6a3a

As long as a user is in the set parameters mode, two asterisks will be typed in the command feedback line indicating that a parameter may be set. After each parameter selection has been made, if a comma is typed one stays in the set parameters mode, if a period is typed one leaves that mode and a # is typed indicating that ARCH is prepared to accept another command. 6a3a1

If more than one of the same parameter set commands is entered for a file the most recent is the one which is entered into the current Master File Directory. A rubout in a parameter set mode deletes the most recent parameter set in the current mode. 6a3a2

If not explicitly set, the default parameters are Activity level=0, private access, removable name, no password. 6a3a3

Activity level. 6a3a4

One sets the estimated activity level in the set parameters mode by typing

**Activity: <number from 0 to ?> (,/.)

where the number is an estimate of the number of times a week the file is to be retrieved. It will be placed on only tape if the number is below a limit determined by the availability of colon space for the archive system. 6a3a4a

Setting accessibility. 6a3a5

Public or private access may be set with the commands in set parameters mode

**General access (./,)
**Owner access (./,) 6a3a5a

Password access... 6a3a5b

Setting durability. 6a3a6

The durability of an archive file refers to whether or not it can be deleted. A file is deleted from the system by having its name removed

from the archive directory.
**Removable name (./,)
**Permanent name (./,) 6a3a6a

The default is "removable". If a name is deleted from the most recent file directory, it still exists in earlier directories and the file still exists on the tape. Only if the tape is recopied will the file be truly deleted. So why is this useful? 6a3a6b

It provides two things.
(1) keeps directory small.
(2) keeps back-up copy. We may want to make it explicit that when a file is deleted it is merely removed from active directory and backup is available. Delete may want to respond with receipt telling which was the last recover directory. 6a3a6b|

Deleting a file. 6a4

A file can be deleted if it is not permanent by using the command
#Eliminate name--- <filename> . 6a4a

If the file is permanent the system responds with the message
Elimination forbidden. 6a4b

May run into trouble if system crashes and we reload the system from an old directory on tape in which the file has not been deleted. We will have backup flags and files to protect us as much as possible. The file still exists on tape unless we clean up the tapes periodically. 6a4c

Directory print and display. 6a5

The information displayed includes the name of the file, the date of creation, accessibility, deletability, perhaps information about size, use, etc. 6a5a

There are several display possibilities for the directories. 6a5b

Display of complete directory. 6a5b|

The following command will create a display of MFD entries for all users. 6a5b|a

#Display Directory Complete. 6a5b|a|

The most recent 20 directory entries appear on the screen following a header giving the effective date of the directory being displayed. Files in the directory will be arranged in the order of entry. 6a5b|b

If the user wishes to go further back in the directory any character other than a rub-out typed on the keyboard would feed the next set of items. 6a5b|b|

A rub-out would abort the catalogue display. 6a5b|b2

Directory display for another user. 6a5b2

Displays 20 most recent files of named user. Continue and Abort commands same as above. 6a5b2a

#Display directory for user <username> . 6a5b2a|

Directory display for current user. 6a5b3

Same as above but for present user. 6a5b3a

#Display directory . 6a5b3a|

The directory may be printed out with the same options as above using the word "Print" instead of "Display". 6a5c

Some filtering will be possible; if instead of a period an "s" is typed, the word "since" will appear. (The letter "b" indicates BEFORE.) Then if a date in the form YY/MM/DD tt:tt is typed in, the first file entries displayed will be those generated on the date closest to or later than that entered (earlier than in the case of BEFORE). (This is to be consistent with conventions in the content analysis feature.) 6a5d

Retrieving a file. 6a6

To retrieve a file from an archive storage device one types the command

#Retrieve file---<filename> . 6a6a

After searching MAD, the system responds with a line of information dealing with the accessibility of the file to the current user. If the file is not entered in the directory the system responds

File not in directory.

and the system awaits the user's next command. 6a6b

If the file is not available to the present user, the following message is entered:

File accessibility denied. 6a6c

If the file is in the directory and accessibility is permitted to the current user the following message is entered:

File on <device name (i.e.,disk, tape number, etc.>.

Estimated retrieval time <time estimate> .

Retrieval--- 6a6d

At this point the user may decide whether or not he wishes to have the file retrieved by entering a "D" for "desired" or an "N" for "not desired". 6a6e

If the file is to be retrieved, the request will be entered in the queue and queue information will be typed out. The file will be brought into a read only colon space with the name (ARCHIVE):<filename> when the queue position of the request had been reached. The file is actually in one of several blocks assigned to ARCH under the names ARC1, ARC2, ARC3, etc. MAD contains pointers to these blocks. (Perhaps a user could access files through the "pseudonym" (<username>):<filename>.) 6a6f

At logout the file remains in ARCH colon space until activity levels are checked; it may then be deleted from colon space, or may remain there if space permits. 6a6f1

If it is in the disc archive retrieval space already, the file is retrieved immediately. 6a6f2

If it is in the tape archive only, the request is entered into the queue and when the request is reached a message is sent to the operator asking for the proper tape to be mounted. 6a6f3

The user may leave ARCH and do other things while the

file is being retrieved. From ARCH using a command
#Order in queue.
he could obtain information concerning his position in the queue. 6a6g

The command
#Location of file <fileneme>.
would tell whether the file had been written into colon space or not. 6a6h

If the file is in use or it has already been requested and is already or will soon be in colon space under the username ARCHIVE, a message will be typed:
File use requested previously. 6a6i

Returning control to EXEC. 6a7

One may leave ARCH by typing the command
#Finished . 6a7a

Operator commands. 6b

****This section has not been fully considered.**** 6b|

When an operator wishes to enter the system to show his availability to mount tapes, he enters the command
#Operator <initials> . 6b2

Only recognized intials will be accepted. 6b3

When the operator leaves he may inform the system that he wll return at a particular time with the command
#Logout. Will return (<time in minutes>/ no) . 6b4

The operator responds with "no" if he does not anticipate returning in a reasonable length of time. 6b5

The time is used to inform users of the estimated retrieval time. 6b5a

The system will request a tape to be mounted with the command
Mount tape <tape no.> on device <no.> . 6b6

The operator responds to this request by either mounting the desired tape and typing
#Ready.
or by entering the message

#Tape not mounted--(./ <reason>.)
The text of the reason will be made available to the user requesting the tape. 6b7

The system requests a tape to be removed with the command
Dismount tape from <device>. 6b8

The operator responds with the message
#Ready. 6b9

If a system crash requires reloading of ARCH from tape a message will be delivered
System crash--reload disc archive.
Mount most recent tape.
The system would then load the most recent extant directory and proceed through the directory entries loading necessary files (on the basis of their activity levels) onto the disc by requesting that the operator mount the necessary tapes. 6b|0

Archiving files onto tapes. 6b||

Once a day (or whenever necessary) an operator will archive the backlog of files onto tape by entering the command
#Tape archive--
Current tape <tape no.> 6b||a

The system keeps track of the amount of space on the tape and informs the operator when a new tape must be mounted. As files are written onto a tape the directory is updated with information concerning the tape location of each file. The final file to be archived at each tape archival is the most recent, updated Master File directory. (We should recall that the copy routine puts some sort of tape directory at the start of each tape----) 6b||b

Additional ideas not yet incorporated. 7

When retrieving from disc we should be able to check the integrity of a file. If it is bad a message should be sent to the user, the file deleted from disc, and a new copy brought in from tape. 7a

```
:4809, 08/06/70 0913:59 HAL ; :JRNL|, 08/05/70 2340:56 HAL ;  .SINCE
(70/07/29 00:00); .SCR=2; .HED="4809 HAL 5 AUG 70
FUNCTIONAL SPECIFICATION FOR PRIMARY TAPE ARCHIVE SYSTEM"; .SNF=72;
.MCH=65; .DSN=|;  .PGN=0; .DPR=0;
```

1810 MAIL 12AUG70

MAIL FILE

(mj)evcd% ca n%fc0%%%a0% , dummy ; %is0%

48|0 MAIL |2AUG70

MAIL FILE

```
 %et:mjd%                                                                |

   (mjd)j0%|% %"Enter (JJJJ III DDMMMYY CR)%xb0%.HED="48|0 MAIL
   |2AUG70


   %.HED="48|0 MAIL |2AUG70

   %et:mj2%                                                              |a

   (mj2)"Journal number = %of': '%%ef%%db:mj%                            |b

   ARG BER BLP CHI DOC DIA DCE DGC EKV HAL JMY JBN JCN JDH JMH
JMY JTM JRX KEV LSL MGC MEH MEJ MET MSC NDM VRB VDB WHP WKE WLB
WSD $48|0.| WSD 08/|2/70 |605:48 THIS IS COMING TO YOU FROM YOUR
NEW MAIL SYSTEM.  TYPE 'F TO CONTINUE NLS, AND SEE
(JOURNAL,48||,) FOR DETAILS ON HOW TO SEND AND DELETE MESSAGES$       2

    WSD $48|0.2 CHI 08/|2/70 |634:23 OH$                               3

    WSD $48|0.3 WSD 08/|2/70 |636:09 THIS IS A SECOND MESSAGE$         4

    BER $48|0.4 WSD 08/|2/70 |706:|| BARBARA..PLEASE PRINT AND
ARCHIVE JOURNAL FILE NUMBER 48||.  THANKS$                            5

    WSD $48|0.5 JCN 08/|2/70 |744:27 SEE YOU MONDAY$                  6
```

:4810, 08/13/70 1016:34 JCN ; , DUMMY ;

48|0 MAIL |2AUG70

MAIL FILE

(mj)evcd% ca n%fc0%%%a0% , dummy ; %is0%

USER DESCRIPTION OF MAIL SYSTEM WITH AUTOMATIC JOURNAL ENTRY

Overview |

Capabilities |a

The mail subsystem will allow a user to send and delete messages automatically, without using QED. |a|

All messages will be automatically entered into the journal , assigned a journal number, and be available for normal journal reference. |a2

A lock mechanism will prevent the loss of messages due to two persons entering messages at the same time. |a3

The mail system will automatically add a header to each message which will contain: |a4

- Journal number and message number (sufficient for identifying the message in the journal) |a4a
- Initials of sender |a4b
- Date and time message is sent |a4c

When you enter NLS, if there is any mail for you, it is typed and you are placed in the mail subsystem. You may continue NLS by typing 'Finished '.; |a5

The mail system may also be used as a separate subsystem ('MAIL'). |a6

Description |b

Send Function |b|

A message is submitted to the mail system from the teletype or as a QED file. |b|a

Note that the file may be created in NLS or TODAS, and then be converted via Output Device QED. |b|a|

A message number is assigned, which has the format: JJJJ.NNNN. |b|b

JJJJ is the number of a Journal file which will contain the message. |b|b|

NNNN is the statement numbeer of the message in the file. |b|b2

Initially all of one days messages will go into one file, so NNNN will be set to | each day. |b|b3

In referencing NNNN, leading zeros will be deleted. |b|b4

The message is reformatted according to the description in (|a5:wg) above. |b|c

The message is finally written onto a permanent journal collection file, and the current message file. |b|d

Delete function |b2

The user may ask that either all messages to him be deleted, or that a specific message (referenced by number, see--|b|b:wg) be deleted. |b2a

His initials are then removed from the destination field in that message in the message file (not the journal file), and the message is deleted if there are no other addressees. |b2a|

Entry into Journal |b2b

At the end of each day, the journal collection file is copied to a QED file,which may be input to NLS via insert QED. |b2b|

The resulting file is entered into the journal, and a new journal collection file is started, with a new journal number, and NNNN set to |. |b2b|a

NLS Compatibility |b2b2

The Mail subsystem should be viewed as a stepping stone in the direction of a mail system which is fully integrated into NLS. |b2b2a

The following steps might represent a reasonable evolution towards this end: |b2b2b

The separate mail subsystem (as described in this specification) |b2b2b|

The mail system described here made into a processor for NLS in the manner of PASS4 (e.g. Output Device Mail) |b2b2b2

Conversion of the mail files to NLS file format, and the inclusion of the mail system as a super processor in the manner of TODAS or the Collector-sorter |b2b2b3

The establishment of individual mail files in NLS format, and a suitable set of commands to manipulate them. |b2b2b4

This may be done via an extended super processor, in the manner of the calculator or??? |b2b2b4a

User Commands 2

Normal Commands 2a

Delete 2a|

Syntax: Delete MeSSAGE-NUMBER . 2a|a

Semantics: A search is made of the mail file for the indicated message. 2a|b

If it is found with the users initials in the destination field, then the users initials are deleted, and the message is deleted if it is addressed to no-one else. 2a|b|

Note that the journal collection is not altered by this command. 2a|b2

Finished 2a2

Syntax: Finished . 2a2a

Semantics: The mail system is exited and you are returned to NLS or the executive. 2a2b

Mail 2a3

Syntax: Mail . 2a3a

Semantics: The mail file is searched, and any messages

addressed to you are typed out. 2a3b

Send 2a4

Syntax: Send FILNAME . 2a4a

Semantics: The indicated file (which may be the teletype) is read by the mail system, and is checked for syntactic corectness 2a4b

If there is not a terminating '$, then one is assumed at the end of the file 2a4b|

If the message is OK, then it is reformatted (with a header added) and sent to he mail and Journal collection files. 2a4b2

The message number (JJJJ.NNNN) is typed on the controling teletype when the message has been successfully dispatched. 2a4b3

Privilaged Commands (Executivity required, INITIALS = JNL) 2b

Copy to Journal 2b|

Syntax: Copy to FILENAME, new journal no. = JJJJ, jjjj. 2b|a

Semantics: This command is used for entering a journal collection file into the Journal. 2b|b

First, the journal collection file is locked, to prevent any user access. 2b|b|

Then it is copied to a backup file and the backup copy is checked for integrity. 2b|b2

The journal collection file is then copied to the sequential file indicated by FILNAME. 2b|b3

Upon completion of this, the journal collection file is initialised with the new journal number. 2b|b4

Note that the new journal number requires a verifying . in order to reduce typographical or transmission errors. 2b|b5

Recover journal collection file 2b2

Syntax: Recover to FILNAME . 2b2a

Semantics: This command is used to access the backup copy of the journal collection file. It is intended for use in the event that there is a problem with the QED file produced by the Copy to Journal command. 2b2b

It simply copies the backup journal collection file to the indicated sequential file. 2b2c

```
:48||, 08/|2/70 |658:49 WSD ; ':MAILMEMO', 08/|2/70 |629:53 WSD ;
.HED="48|| WSD |2AUG70
USER DESCRIPTION OF MAIL SYSTEM WITH AUTOMATIC JOURNAL ENTRY";  .SNF=72;
.MCH=65; .DSN=|; .DPR=0;
```

48|2 WKE ||AUG70

MEMO ON 940 SCHEDULING

```
 %et:mjd%                                                                |

   (mjd)j0%|% %"Enter (JJJJ III DDMMMYY CR)%xb0%.HED="48|2 WKE
   ||AUG70


   %.HED="48|2 WKE ||AUG70

   %et:mj2%                                                              |a

   (mj2)"Journal number = %of': '%%ef%%db:mj%                            |b

System use schedule -- for explination see (schd:wny).                    2

                                                                          3

Week beginning 8/9                                                        4

   Sunday                                                                 4a

      6:00 AM to |2:00  TSS I - ARG                                       4a|

   Monday                                                                 4b

      |:00 to 4:00 NLS - WHP                                             4b|

      5:30 to 9:30 Hdw II - EKV (printer down)                            4b2

   Tuesday                                                                4c

      |2:00 midnight to 6:00 AM  TSS I - JDH                             4c|

      |2:00 to 4:00 NLS - WHP                                            4c2

   Wednesday                                                              4d

      |2:00 midnight to 2:00 AM  HDW I - XDS                             4d|

      2:00 to 6:00 AM  TSS I - JDH                                        4d2

      6:00 to 8:00 AM  TSS I - FVB                                        4d3

      |2:00 to 4:00 NLS - WHP                                            4d4

   Thursday                                                               4e

      |2:00 midnight to 6:00 AM  TSS I - JDH                             4e|
```

MEMO ON 940 SCHEDULING

*** 9:00 AM to 3:30 Printer will be down - RDB *** 4e2

12:00 to 3:30 NLS - WHP 4e3

3:30 to 6:30 HDW II - RDB printer debug 4e4

Friday 4f

12:00 midnight to 6:00 AM TSS I - JDH 4f1

12:00 to 4:00 NLS - WHP 4f2

Saturday 4g

4h

Week beginning 8/16 5

Sunday 5a

Monday 5b

Tuesday 5c

Wednesday 5d

12:00 midnight to 2:00 AM HDW I - XDS 5d1

Thursday 5e

Friday 5f

Saturday 5g

5h

(schd) This file is indended as a current schedule of usage of the 940 system. 6

It will be maintained by me (Bill English) -- any disputes should be taken up with me or my representative. 6a

This is a trial format -- it will be changed as improvements are discovered and needs change. 6b

I will try to maintain a complete schedule at least three days

in advance. Any anticipated usage that is known earlier will be entered as soon as possible. 6c

Special notes affecting users (such as "printer down") will be included. 6d

Time not scheduled is assumed to be "General". 6e

For explination of categories see (cat:wny). 6f

(cat) The categories of usage that seem to fill the current needs are: 7

Hdw I -- Entire system is down for hardware work. No users. 7a

Hdw II -- System is up but hardware debugging is in progress and has priority. Users should check with the person named in the schedule for availability. 7b

TSS I -- Entire system down for TSS work. No users. 7c

TSS II -- Special programs that may cause crashes are being debugged. System is up but other users beware. Check with the person named in the schedule. 7d

NLS -- NLS programmers have priority. Other users may be asked to get off at times. No other debugging that may cause crashes and no hardware work. 7e

User -- Special user requirements such as reports and visitors. have priority. Other users may be asked to leave. 7f

General -- Avaalable for general use. Dangerous programs may be tried if there is reasonable assurance that they will not cause crashes. If they cause crashes they may be asked to leave and reserve time in the TSS category. Hardware work may be conducted on one hardware system at a time under the same rules as for special programs. 7g

:4812, 08/13/70 1018:18 JCN ; :SCHED, 08/11/70 2022:25 WKE ; TO ARC FROM WKE

4812 WKE ||AUG70

MEMO ON 940 SCHEDULING

(mj)evcd% ca n%fc0%%%a0% , dummy ; %is0%

48|3 MAIL |3AUG70

mail file

```
 %et:mjd%                                                                |

    (mjd)j0%|% %"Enter (JJJ III DDMMMYY CR)%xb0%.HED="48|3 MAIL
    |3AUG70


    %.HED="48|3 MAIL |3AUG70

    %et:mj2%                                                            |a

    (mj2)"Journal number = %of': '%%ef%%db:mj%                          |b

     JCN $48|3.| WSD 08/|3/70 0002:59 JIM..DID YOU SEND ME A
MESSAGE (SEE YOU MONDAY) AND THEN DELETE IT???. IF NOT, THEN WE
HAVE A BUG$                                                             2

     BER $48|3.2 WSD 08/|3/70 0005:32 PLEASE ARCHIVE 48|0 AND
48|2$                                                                   3

     CHI  MSC  WHP $48|3.3 WSD 08/|3/70 00|2:04 INSERT QED DOESN'T
SEEM TO WORK IN THE NEW TODAS$                                          4

     WSD $48|3.4 JCN 08/|3/70 0820:20 I SENT THE MESSAGE WHILE YOU
WERE STILL AT  ARC, AND THEN DELETED IT. AS YOU SEE, ANYONE CAN
DELETE A MESSAGE TO SOMEONE ELSE. A PERSON ISN'T NECESSARILY
NOTIFIED AFTER A MESAAGE IS SENT, EVEN IF HE IS ON THE SYSTEM.
WOULD A PASSWORD FOR DELETIONS BE USEFUL.. OR A BOTHER? ANYWAY,
NO BUG, JUST A BLIP.$                                                   5

     HAL $48|3.5 HAL 08/|3/70 0856:45 THIS IS A TEST MESSAGE...
DOES THIS THING REALLY WORK?$                                           6

     WSD $48|3.6 HAL 08/|3/70 0902:26 CONGRATULATIONS ON THE MAIL
SYSTEM--- IT WORKS NICELY.  I NOTICE THAT WHEN I TYPE A RUB-OUT I
GET OUT  OF THE SYSTEM.  PERHAPS THIS COULD BE MODIFIED.  I READ
THE PROGRAMS YOU GAVE ME YESTERDAY.  WAS IMPRESSED WITH THE WAY
YOU HANDLED ERROR RETURNS IN IF-STATEMENTS AND PLAN TO DO
SOMETHING SIMILAR IN THE ARCHIVE ROUTINE.  I PLAN TO WORK THIS
WEEKEND TO GET AS MUCH OF THE USER PROGRAM AS POSSIBLE CODED.
WILL SEE YOU MONDAY--- HARVEY$                                          7

     WSD $48|3.7 JCN 08/|3/70 |020:44 I FOUND ILLEGAL CHARACTERS
IN JOURNAL FILES 48|0, 48|2, AND MJ  . CHI ADVISES TO CLEANUP TO
COMPLETION, SO I DID. THATS ALL I DID, SO THE "FROZEN" FILES  ARE
STILL UNCHANGED FROM WHEN YOU SET THEM TO RO. OK?$                      8

     JCN $48|3.8 WSD 08/|3/70 |03|:57 OK...THANKS FOR NOTE.  I
```

mail file

THINK THAT FOR THE TIME BEING, WE SHOULD TRY TO LIVE WITHOUT PASSWORDS. I ONLY SAW THE MESSAGE BECAUSE I WAS CHECKING FILE FOR POSSIBLE BUGS$ 9

HAL $48|3.9 WSD 08/|3/70 |033:59 THANKS FOR THE NOTE...SEE YOU MON AND HOPE YOUR COLD IS BETTER$ |0

JCN $48|3.|0 WSD 08/|3/70 |037:|4 FILES 48|0 AND 48|2 SHOULD BE CLAENED UP IN NLS, SINCE A BUG PREVENTS TODAS FILE CLENUP FROM DETECTING ILLEGAL CHARS (WHP IS LOOKING INTO IT). :MJ SHOULD HAVE ILLEGAL CHARS IN IT$ ||

WKE $48|3.|| WSD 08/|3/70 |037:|4 DO WE HAVE ANY SPEC ON OPERATING ENVIRONMENT FOR IMLAC (TEMP, HUMIDITY, ETC.)???$ |2

ARG BER BLP CHI DOC DIA DCE DGC EKV HAL JMY JBN JCN JDH JMH JMY JTM JRX KEV LSL MGC MEH MEJ MET MSC NDM VRB VDB WHP WKE WLB WSD $48|3.|2 WSD 08/|3/70 |055:39 MAIL SYSTEM HAS BEEN FIXED SO A RUBOUT TYPED (WHEN IT IS CALLED FROM NLS/TODAS) WILL TAKE YOU BACK TO NLS/TODAS RETHER THAN THE EXEC$ |3

WSD $48|3.|3 HAL 08/|3/70 |3|6:42 THANKS FOR FIXING THE RUBOUT IN MAIL. ANOTHER SUGGESTION-- WHEN I ENTER NNLS AFTER TYPING MY INITIALS AND USER NAME I SOMETIMES HANG UP THEN GET THE MESSAGE "FILE IN USE ",FILE OPEN FAIL , THEN WHEN THE MAIL SYSTEM STARTS I ENTER THE SYSTEM EVEN IF I DON'T HAVE ANY MESSAGES MESSAGES. I HAVE BEEN LOOKING AT THE CODE FOR NMAIL AND PLAYING AROUND IN DDT. EVERYTHING'S FALLING INTO PLACE. ---HARVEY$ |4

WSD $48|3.|4 BER 08/|3/70 |55|:58 I COPIED FILE 48|| INTO THE JOURNAL TAPE, REEL 35. ALSO, FILES 48|0 AND 48|2 INTO ARCHIVE TAPE 36 AS YOU REQUESTED. DID YOU ALSO WANT THEM ON THE JOURNAL TAPE? NO HARD COPIES YET, PRINTER DOWN, BUT I WILL FIRDAY AM.$ |5

WSD $48|3.|5 WLB 08/|3/70 |558:36 HOW ABOUT FIXING THE DELETE FUNCTION SO THAT IT USES A DEFAULT OPTION FOR FILE NAME -- I.E. SO THAT YOU ONLY HAVE TO TYPE THE MESSAGE NUMBER IN MOST CASES??$ |6

BLP $48|3.|6 WLB 08/|3/70 |559:4| HOPE YOU ARE FEELING BETTER. WE MISS YOU. LOVE. $ |7

BER $48|3.|7 JCN 08/|3/70 |602:|5 HOW IS THE PO FILE COMING? IS IT GETTING TOO LARGE?$ |8

LOST |9

Lost 20

mail file

Lost 2|

WLB $48|3.2| WLB 08/|3/70 |605:|2 $ 22

WSD $48|3.22 JCN 08/|3/70 |606:|3 MIL ASKS: CAN YOU BRING A BANK DEPOSIT SLIP WHEN YOU COME DOWN NEXT? ..MONDAY?$ 23

WSD $48|3.23 WKE 08/|3/70 |659:27 WE DON'T HAVE SPECS ON THE IMLAC YET. SHOULD BE HERE WITH THE MACHINE IN THE NEXT DAY SOR SO. IT WAS SHIPPED MONDAY WKE |3 AUG $ 24

HAL $48|3.24 WSD 08/|3/70 2223:05 WORKING ON FILE IN USE PROBLEM..STANDBY$ 25

BER $48|3.25 WSD 08/|3/70 2224:34 BARBARA..THANKS FOR DOING FILES. I MEANT TO PUT 48|0 AND 48|2 ONTO JOURNAL TAPE WHEN I SAID ARCHIVE..SORYY.. PLEASE PUT THEM ONTO JOURNAL TAPE$ 26

WLB $48|3.26 WSD 08/|3/70 2227:39 THAT IS AN INTERESTING IDEA (48|3.|5), BUT CURRENTLY NOT CONVENIENT TO IMPLEMENT...MAYBE IN A WHILE. I HAVE THOUGHT OF TWO THINGS WHICH I WOULD LIKE AN OPINION ON: (|) DELETE ALL COMMAND (DELETES ALL MESSAGES ADDRESSED TO USER) (2) USING ', RATHER THAN '. AS SEPARATOR BETWEEN JOURNAL AND MESSAGE NUMBERS, SO MESSAGE NUMBER FORMAT WOULD BE COMPATIBLE WITH LINKS$ 27

JCN MIL $48|3.27 WSD 08/|3/70 2229:35 SURE I CAN BRING A DEPOSIT SLIP. AND I HAVE CHANGED MY MIND ABOUT WANTING A POCKET DICTATOR..I THINK THAT IT WOULD BE USEFUL. PARTICULARLY, I WANT TO TRY USING IT FOR SOFTWARE DOCUMENTATION.$ 28

WKE $48|3.28 WSD 08/|3/70 2230:49 OK... I SA THE DISASSEMBLED IMLAC ON WEDS. LOOKS INTERESTING.$ 29

:48|3, 08/|4/70 ||04:3| JCN ; ':MAIL', 08/|3/70 23|9:2| WSD ;

48|3 MAIL |3AUG70

mail file

(mj)evcd% ca n%fc0%%%a0% , dummy ; %is0%

ARG BER BLP CHI DOC DIA DCE DGC EKV HAL JMY JBN JCN JDH JMH JMY JTM JRX KEV LSL MGC MEH MEJ MET MSC NDM VRB VDB WHP WKE WLB WSD $48|4.| WSD 08/|3/70 2340:25 DUE TO A BUG, THE MESAGES NUMBERED 48|3.|8, 48|3.|9, 48|3.20 WERE LOST AND NOT SENT. SORRY$ 1

WSD $48|4.2 WLB 08/|4/70 0855:52 DELETE ALL COMMAND WOULD BE NICE. IT'S IMPOSSIBLE TO DISCRIMINATE BETWEEN COMMA AND PERIOD ON THE DISPLAYS -- SO THE SECOND SUGGESTION IS RATHER CRIPTIC --- I THOUGHT COMMA WAS THE DELIMETER ALL ALONG $ 2

WSD $48|4.3 WLB 08/|4/70 0856:08 SENDING MAIL IS GETTING TO BE DAMN NEAR IMPOSSIBLE. OUTPUT QED DOESNT SEEM TO WORK (AT LEAST NOT IN TIME SPANS ON THE ORDER OF A QUARTER HOUR), AND THE MAIL FILE SEEMS TO BE ALWAYS IN USE SO THAT MESSAGES COMPOSED IN THE MAIL SYSTEM ARE LOST. I HATE TO DEPEND ON QED, BUT IF THAT IS NECESSARY, EVERYONE SHOULD BE WARNED OF THIS NECESSITY AND GIVEN SOME REFERENCE MATERIAL ON QED SO THAT IT CAN BE USED EFF EFFECTIVELY. $ 3

DCE $48|4.4 WLB 08/|4/70 0858:47 THE NASA REPORT HAS BEEN MAILED, AND WE HAVE A FEW EXTRA CPIES (THE REST WILL BE READY SOON). I AM WORKING AT SETTING UP THE NIC P NIC PLANNING FILES SO THAT WE CAN START FILLING IN MORE OF THE SUBSTANTIVE INFORMATION NEXT WEEK. I HOPE THAT YOU ARE RECOVERING FROM THE PLAGUE AND GETTING SOME OF THAT MUCH-NEEDED REST. -- WALT $ 4

WSD $48|4.5 WLB 08/|4/70 0903:35 IT TOOK ME |8 HOURS TO GET THE PREVIOUS MSG TO YOU ODQ DIDN'T WORK, THEN THE MAIL FILE WAS LOCKED UP FOR ALL THE TIME I WAS TRYING TO ACCESS IT YESTERDAY. NOONE WAS USING IT AND I TRIED RESETING DUVALL, DIALOG, JOURNAL, AND SYSTEM WITH NO LUCK. DO YOU KNOW WHAT THE HANGUP WAS? ALSO IT SHOULD BE POSSIBLE TO PUT SEVERAL MESSAGES IN A SINGLE FILE TO SEND THROUGH THE MAIL. AT PRESENT ONLY THE FIRST MESSAGE IN A FILE IS PROCESSED. $ 5

WSD $48|4.6 CHI 08/|4/70 0945:40 RE: 48|3.3--INSERT QED SEEMS TO WORK IN TODAS. I TRIED A TEST QED FILE WHICH WORKED .$ 6

WLB $48|4.7 WSD 08/|4/70 0950:24 WALT: (48|4.2) THANX FO COMMENT (48|4.3) I HAVE LENGTHENED THE TIME WHICH MAIL WILL WAIT FOR THE MAIL FILE TO BE FREE..LETS SEE IF THAT HELPS. I THINK THAT THE SOLUTION IS AN 'OUTPUT DEVICE MAIL' COMMAND, WHICH WAS IN MIND WHEN THE NEW MAIL SYSTEM WAS DEVISED, SO IT IS NOT TOO FAR AWAY IF SOMEONE GETS THE TIME. (I WOULD SAY 2-5 DAYS EFFORT MAYBE). I WILL NOT HAVE THE TIME FOR 4-6 WEEKS I SUSPECT.

(48|4.5) THE SYSTEM WAS SCREWED UP. I THINK THAT IT HAS TO DUE WITH TESTING THE UNIVAC DRUMS. SEE JDH OR KEV WHEN IT HAPPENS.$ 7

WSD $48|4.8 WKE 08/|4/70 0950:50 we found out a little more about the imlac requirements, but don't worry. By the time you get it, the weather will be cooler, and if there is a warm spell, you can still work at night. wke$ 8

WSD $48|4.|| WLB 08/|4/70 |033:35 (48|4,7) it helps sometimes, but is the mail file locked whenever someone is sending ':teletype'? I also keep getting "checksum error" messages when using any of the mail sys commands. -- it is getting increasingly unprofitable to use the mail (as opposed to, say, carrier pidgeons. $ 9

WSD $48|4.|3 BER 08/|4/70 ||29:50 BILL--FILES 48|0, ||, |2, AND |3 ARE ON JOURNAL TAPE 35. THE HARD COPIES SHOULD BE COMING OFF THE PRINTER NOW. SORRY ABOUT THE MIX UP. I TAKE THINGS TOO LITERALLY. BARBARA$ |0

WSD $48|4.|4 WLB 08/|4/70 |302:48 GODDAM THE MAIL SYSTEM ANYWAY. $ ||

WHP CHI $48|4.|6 WLB 08/|4/70 |305:24 THE NAME HANDLING FUNCTIONS OF NLS ARE COMPLETELY FUCKED UP WHEN NON-STANDARD NAME DELIMETERS ARE USED. PLEASE SEE ME FOR DETAILS -- I JUST WROTE YOU A LONG MEMO WHICH THE MAIL SYSTEM MANAGED TO CRAP ON. $ |2

BLP $48|4.|7 NDM 08/|4/70 |3|9:00 BRUCE: HOW ARE YOU FEELING? IS THERE ANYTHING I CAN DO FOR YOU ON THIS END OF THE LINE? DEAN $ |3

DCE $48|4.|8 JCN 08/|4/70 |452:|2 MARVIN DENNICOFF WOULD LIKE TO SEE YOU NEXT WEDNESDAY AT 9:30 .. OK?$ |4

WLB $48|4.|9 JCN 08/|4/70 |640:|3 testing the limits again, i see, and on more than one front.$ |5

dummy |6

```
':48|4', 08/|4/70 |744:48 WSD ; .HED="48|4 MAIL |4AUG70
Mail File";  ':MAIL', 08/|4/70 |727:59 WSD ;
.SNF=72;.MCH=65;.PGN=0;.DSN=|;.DPR=0;
```

48|5 MAIL |7AUG70

MAIL FILE

JBN $48|5.| JCN 08/|4/70 |70|:|2 THIS IS A TEST OF THE SYSTEM$ 1

WLB $48|5.2 WSD 08/|4/70 |704:59 THE FILE IS NOT LICKED WHEN A MESSAGE IS BEING ENTERED.$ 2

WLB $48|5.3 WSD 08/|4/70 |707:00 CHECKSUM ERROR CAUSED BY DRUM ERROR OR ???. IT IS FIXED NOW. PLEASE CALL ME (707) 823 05|O WHEN THINGS LIKE THAT HAPPEN$ 3

WLB $48|5.4 WSD 08/|4/70 |709:33 WALT.. I AM GOING ON THE ASSUMPTION THAT THE MAIL SYSTEM FULLFILLS A SIGNIFICANT FUNCTION. I THEREFORE WOULD RATHER ADOPT A POSITIVE ATTITUDE OF EVOLUTION RATHER THAN A NEGATIVE ONE OF DESTRUCTION. PLEASE BEAR WITH ME AND SUGGEST IMPROVEMENTS, AS YOU HAVE BEEN DOING$ 4

CHI $48|5.5 WSD 08/|4/70 |7|6:43 TRY FILE BADIQD UNDER DUVALL FOR INSERT QED TEST$ 5

CHI $48|5.6 WSD 08/|4/70 |749:|4 PROBLEm WITH IQD IS IN CENTERDOT DEFINITION FOR DIFFERENT DEVICES. HENCE, IT WORKS FROM DISPLAYS AND NOT FROM TERMINETS.$ 6

WSD $48|5.7 WLB 08/|4/70 |749:26 SORRY IF MY FRUSTRATION COMES ON TOO STRONG. THINGS HAVE GOTTEN PRETTY HEAVY FOR ME TODAY. -- WALT $ 7

JCN BER $48|5.8 WSD 08/|4/70 |750:|6 PLEASE 'JOURNALISE' 48|4. ALSO, FILE :MJ IS SUPPOSED TO HAVE ILLEGAL CHARACTERS IN IT. PLEASE LEAVE IT THAT WAY.$ 8

WLB $48|5.9 WSD 08/|4/70 |752:0| RIGHT. I AM GETTING A LOT OF SHIT ABOUT MAIL SYSTEM FROM MANY SOURCES, AND I DON'T WANT TO GET DEFENSIVE ABOUT IT. HENCE THE NOTE... HOPE THINGS GET BETTER.$ 9

WSD $48|5.|O WLB 08/|4/70 |752:49 PS.. I DO LIKE TH IDEA OF THE MAIL SYSTEM AND SEE THE EVOLUTION PROCEDING AT A REMARKABLE PACE. SOMETIMES I GO OFF THE DEEP END IN CRITICISING 'CAUSE I USUALLY WISH TOMORROW HAD BEEN DONE LAST YEAR $ |O

WSD $48|5.|| WSD 08/|4/70 |948:|| HI WSD$ ||

BER $48|5.|2 WSD 08/|4/70 205|:37 PLEASE JOURNALISE 48|6$ |2

MAIL FILE

JCN $48|5.|3 WSD 08/|4/70 2052:25 FILE (NORTON):JRNL| ENTERED INTO JOURNAL AS 48|6$ |3

WHP $48|5.|4 WSD 08/|4/70 2||0:09 I HAVE AN MOL PROGRAM WHICH COMPIELES, BUT WON'T LOAD WITH DDT SPEWING OUT SOME VERY CRYPTIC STUFF...IT IS (DUV):CHECK. WOULD YOU PLEASE VOICE AN OPINION AS TO WHETHER IT IS A PROGRAM OR COMPILER OR T. META BUG. BINARY FILE IS UNDER (DUV):B|, IF YOU WANT TO TRY TO LOAD IT$ |4

CHI WHP $48|5.|5 WLB 08/|7/70 |205:37 I THOUGHT THAT MY TROUBLE WITH STATEMENT NAMES MIGHT BE DUE TO THE USE OF NON-STANDARD NAME DELIMETERS. IT WASN'T.$ |5

CHI WHP $48|5.|6 WLB 08/|7/70 |2|3:53 THEN I THOUGHT IT MIGHT BE DUE TO THE USE OF FUNNY NAMES INVOLVING SPECIAL CHARACTERS. BUT IT WASN'T THAT EITHER.$ |6

ARG BER BLP CHI DOC DIA DGE DGC EKV HAL JMY JBN JCN JDH JMH JMY JTM JRX KEV LSL MGC MEH MEJ MET MSC NDM VRB VDB WHP WKE WLB WSD $48|5.|7 WSD 08/|7/70 |344:46 SOME BUGS HAVE BEEN FIXED IN THE MAIL SYSTEM. MESSAGES WILL BE TYPED MORE QUICKLY, WHEN IT CRASHES DURING SENDING A MESSAGE, YOU MAY BE ASSURED THAT IT HAS SENT YOUR MESSAGE IF IT HAS TYPED OUT THE NUMBER, ANS IT HAS NO IF THE NUMBER HAS NOT BEEN TYPED, AND SOME THINGS HAVE BEEN PUT IN TO SPEED IT UP$ |7

:48|5, 08/|7/70 |652:36 WSD ; ':MAIL', 08/|7/70 |52|:56 WSD ;.HED="48|5
MAIL |7AUG70

MAIL FILE"; .SNF=72;.MCH=65;.PGN=0;.DSN=|;.DPR=0;

PROJECT 8457 (RADC)

From RADC Purchase Request No. B-0-3221 2/13/70 (ESU 69-100)
,

as ammended 4/7/70

Contract No. F30602-70-C-0219

DELIVERABLE ITEMS

Item A001 Engineering Services as per 4.1 of SOW

due 24 months from start (2/9/72)

Item A002 Management Reports as per 5.1 of SOW

due quarterly: 8 cys (3-ARPA, 5-RADC(EMKI)

5/9/70 sent due 15 days after end of quarter?

8/9/70 in preparation 8/13-14

11/9/70

2/9/71 replaced by Annual Technical Report ?

5/9/71

8/9/71

11/9/71

2/9/72 replaced by Final Technical Report ?

Item A003 Technical Report(s) as per 5.2 of SOW

Drafts due 12 and 25 months from start (2/9/71 and 3/9/72)

2/9/71 Draft (interim) 12 cys (6-ARPA, 6-RADC(EMTR))

4/9/71 Reproducible (interim) 1 REPRO + 3 cys RADC(EMTR))

3/9/72 Draft (Final) |2 cys (6-ARPA, 6-RADC(EMTR)) |c3a3

5/9/72 Reproducible (Final) | REPRO + 3 cys RADC(EMTR)) |c3a4

Item A004 Contract Fund Status Report | set as per 5.3 of SOW |c4

due quarterly: | set RADC(EMKI) |c4a

5/9/70 due |5 days after close By Barrick's office |c4a|

8/9/70 |c4a2

11/9/70 |c4a3

2/9/71 |c4a4

5/9/71 |c4a5

8/9/71 |c4a6

11/9/71 |c4a7

2/9/72 |c4a8

CONTRACT STATEMENT OF WORK |d

From RADC Purchase Request No. B-0-322| 2/13/70 |d|

RESEARCH AND WORK TECHNOLOGY WORK STATEMENT |d|a

Objective: The object of this effort is to continue to explore and develop means of effectively using on-line time-shared computer systems to improve individual and team job performance. |d|b

Background: The majority of computer based information systems developed in the past fall into two classes; those designed to present summarized information in a timely fashion to high level commanders and managers and those designed to retrieve specific information from large files for use by lower level individuals. The first class of systems serve a limited number of people. The second class can serve many, but

assists only in a minute portion of an individual's daily activity. Few attempts have been made to completely integrate individuals performing intellectual tasks with a computer. Those instances where this has been accomplished have been exceedingly costly and limited to highly specialized tasks. The research being undertaken at SRI at the Augmented Human Intellect Research Center (AHIRC) has demonstrated the potential of combining the human and computer into a system whose effectiveness exceeds that of either part. This effort will continue development of procedures, equipment, software, and languages to make the system more versatile and extendible to enviroments outside that existing at AHIRC. |d|c

Areas of Consideration: N/A. |d|d

Requirements |d|e

The Contractor shall perform research aimed at the development of computer augmentation techniques using a time-sharing computer and related hardware and software. This shall be accomplished by maintaining and improving the capabilities of a time-sharing computer facility that can be used by researchers in the performance of their everyday jobs with access to on-line cathode ray tube work-stations, thereby offering the user the power of a computer system constantly during his working day. Areas of work shall include the following: |d|e|

Network Information Center. Operational administration of the Network Information Center services will be continued. The following services shall be expanded and improved: |d|e|a

ARPA Network Participation. Participation in the Network experiment will continue, with the following primary goals: |d|e|a|

Development of basic facility hardware and software to support Network Information Center services. |d|e|a|a

Development of techniques to permit the use of the on-line system (NLS) from display terminals in the Network. |d|e|a|b

Typewriter-Oriented Documentation Aid System (TODAS); allowing flexible access to the NIC from typewriter terminals throughout the Network. |d|e|a2

Graphics-Oriented Document Output System, producing hard copy in microform and paper for distribution to NIC users. |d|e|a3

Collection techniques for soliciting and integrating documents into the NIC collection. |d|e|a4

File management tecnniques, including indexing and retrieval, to accommodate the expanding collection.
New services such as messages, news, complaints, etc., wll be added as the needs emerge. |d|e|a5

Team Augmentation Research: In augmentation system development and research the Contractor shall concentrate on those aspects that support design teams. This shall involve the following: |d|e|b

Development of a user- and service-system design discipline to guide the evolution and evaluaton of team augmentation systems. |d|e|b|

Study and development of management techniques necessary to effectively coordinate augmented design teams. |d|e|b2

Development of special user subsystems to support team collaboration. |d|e|b3

Computer Facility. This contract will support the lease, maintenance and operation of the basic computer facility, including such items as the display. |d|e|c

Reports |d|f

Management Report(s) shall be prepared and submitted by the contractor in accordance with the Contract Schedule. Tne primary purpose of these brief reports is to inform the various levels of management and not

for technical uses, they should not contain detailed technical descriptions, formulae, equations, graphs, or other technical documentation. These should be included in technical reports. Three copies of each report will be submitted by the contractor. |d|f|

Technical report(s) shall be provided, as scheduled in the contract, to present a precise and factual description of technical findings and accomplishments. |d|f2

Contract Funds Status Report. (CFSR DD form 1586) |d|f3

|d|f4

REPORTS: |e

Item A002 Management Reports |e|

Form from Contract: |e|a

The heading of each report should contain at least the following information: |e|a|

ARPA Order Number and Program Code Number	Principal Investigator Phone Number
Name of Contractor	Contract Expiration date
Date of Contract	Project Scientist or Engineer
Amount of Contract	Name and Phone Number
Contract Number	Short Title of Work

|e|a|a

Each report will be in letter form and generally not exceed three pages in length. It will present a narrative summary of the work performed including specific reference to the topics listed below. The initial report should include an introduction outlining the background, objectives and assignment of responsibility for the project. |e|a2

Any of these topics may be covered by inserting "none", "not applicable", or "no significant change" where appropriate. |e|a3

|e|a3a

RESEARCH PROGRAM AND PLAN |e|a4

|e|a4a

A brief statement of objectives and plan for research will be included in the report. |e|a4b

|e|a4b|

MAJOR ACCOMPLISHMENTS |e|a5

|e|a5a

This should include a brief description, written in lay terms, of any finding or accomplishment considered worthy of being brought to the attention of management. The meeting of routine schedules should not be included, but the accomplishment of major milestones should be reported. |e|a5b

|e|a5b|

PROBLEMS ENOUNTERED |e|a6

|e|a6a

This topic should make reference to difficulties encountered with personnel, facilities, contracts, availability of literature, funds, strikes, disasters,etc., which significantly affect the progress of work involved. Problems of a technical nature should also be included, but in brief, non-technical terms. |e|a6b

|e|a6c

FISCAL STATUS |e|a7

|e|a7a

This should include: |e|a7b

1. Estimated Contractor expenditures and commitments to date. |e|a7c

2. Estimated funds required to complete the work. |e|a7d

3. Estimated date of completion of work (When different from that specified in ARPA Orders of the Contract). |e|a7e

|e|a7f

ACTION REQUIRED BY THE GOVERNMENT |e|a8

|e|a8a

Normally, this will include any assistance from ARPA in resolving "problems enountered". |e|a8b

|e|a8c

FUTURE PLANS |e|a9

|e|a9a

A brief statement of any significant change which is planned in the course of work underway or any new item which is considered to be of interest to management. |e|a9b

|e|a|0

QUARTERLY MANAGEMENT REPORT 1, covering the period 9 February 1970 through 8 May 1970 |e|b

|e|b|

ARPA Order Number: 967, Program: |e|b|a

Title: Network Information Center and Computer Augmented Team Interaction |e|b|b

Contractor: Augmentation Research Center, Stanford Research Institute |e|b|c

Date of Contract: 9 February 1970 |e|b|d

Amount of Contract: $2,410,480 |e|b|e

Contract Number: F30602-70-C-0219 |e|b|f

Principal Investigator: Dr. Douglas C. Engelbart, phone (415) 326-6200, ext. 2220 |e|b|g

Contract Expiration Date: 9 May 1972 |e|b|h

|e|b|i

I RESEARCH PROGRAM AND PLAN |e|b2

As per our proposal and contract, work is progressing in the following areas: |e|b2a

A. Network Participation |e|b2b

Furtner development of the Network Operating System |e|b2b|

Operational administration of the Network Information Center. |e|b2b2

Use by ARC of the Network facilities as they become available and as appropriate |e|b2b3

B. Team Augmentation Research |e|b2c

Development of a user- and service-system

design discipline |e|b2c|

Management techniques to coordinate augmented design teams |e|b2c2

Special user subsystems to support team collaboration |e|b2c3

C. Computer Facility evolution and maintenamce |e|b2d

II MAJOR ACCOMPLISHMENTS |e|b3

No major accomplishments as yet during the term of this new contract. Work is proceeding on the above areas of work. |e|b3a

III PROBLEMS ENCOUNTERED |e|b4

No major problems |e|b4a

IV FISCAL STATUS |e|b5

Estimated expenditures and commitments to date are: $ 450,287. |e|b5a

Estimated funds required to complete the work are: $ 1,960,193. |e|b5b

Estimated date of completion of work: February 9, 1972 . |e|b5c

V ACTION REQUIRED BY THE GOVERNMENT |e|b6

None |e|b6a

VI FUTURE PLANS |e|b7

Concentration of effort in the following areas is planned for the coming quarter. |e|b7a

A. Journal and Dialogue Support System (DSS) |e|b7b

Design and development work on the Journal and DSS will continue. |e|b7b|

B. Further computer facility design and planning |e|b7c

C. Network Participation |e|b7d

Submitted by:

D. C. Engelbart, Principal Investigator |e|b8

Approved:

D. R. Brown, Director Information Science Laboratory |e|b9

QUARTERLY MANAGEMENT REPORT 2, covering the period 9 May |970 through 6 August |970 |e|c

|e|c|

ARPA Order Number: 967, Program: |e|c|a

Title: Network Information Center and Computer Augmented Team Interaction |e|c|b

Contractor: Augmentation Research Center, Stanford Research Institute |e|c|c

Date of Contract: 9 February |970 |e|c|d

Amount of Contract: $2,4|0,480 |e|c|e

Contract Number: F30602-70-C-02|9 |e|c|f

Principal Investigator: Dr. Douglas C. Engelbart, phone (4|5) 326-6200, ext. 2220 |e|c|g

Contract Expiration Date: 9 May |972 |e|c|h

|e|c|i

I RESEARCH PROGRAM AND PLAN |e|c2

In process |e|c2a

II MAJOR ACCOMPLISHMENTS |e|c3

In process |e|c3a

III PROBLEMS ENCOUNTERED |e|c4

In process |e|c4a

IV FISCAL STATUS |e|c5

Estimated expenditures and commitments to date are: $ 520,154, excluding computer lease commitments. |e|c5a

Estimated funds required to complete the work are: $ 1,890,326 |e|c5b

Estimated date of completion of work: February 9, 1972 . |e|c5c

V ACTION REQUIRED BY THE GOVERNMENT |e|c6

In process |e|c6a

VI FUTURE PLANS |e|c7

In process |e|c7a

Submitted by:

D. C. Engelbart, Principal Investigator |e|c8

Approved:

D. R. Brown, Director Information Science Laboratory |e|c9

|e|d

|e|d|

Item A003 Technical Report(s) as per 5.2 of SOW |e2

|e2a

1. Technical reports shall be provided, as scheduled in the contract, to present a concise and factual discussion of technical findings and accomplishments. The report should be of technical publication quality, including appropriate subject matter references. |e2b

|e2b|

2. The report should include a ... fill in later... |e2c

|e2c|

3. The Heading or Cover Page ... |e2d

|e2d|

4. The Title Page ... |e2e

|e2e|

5. The Forward Page ... |e2f

|e2f|

6. Technical Report Summaries ... |e2g

|e2g|

7. The DD Form 1473 ... |e2h

|e2h|

8. Abbreviations, acronyms, and Code names ... |e2i

|e2i|

|e2j

Item A004 Contract Fund Status Report |e3

|e3a

1. The contractor shall prepare the CFSR (DD Form 1586) in accordance with the instructions in paragraphs 2 and 3. A separate DD form 1586 shall be prepared for each contract on a complete eapon/suppot system and/or major major segments as specified by the contracting officer. When specified in the contract, the contractor may submit hard-copy printouts from his punched cards or magnetic tapes in lieu of the DoD-approved DD form 1586, provided that the printouts are identical in content and structure the the DD form 1586. |e3b

2. General Instructions: .... fill in later.... |e3c

a. Reporting on multiple appropriations |e3c1

b. Required levels of detail |e3c2

c. The procuring contacting officer (PCO) may, at his descretion, include the DD form 1586 in contracts whose value is between $100,000 and $500,000. |e3c3

d. Reporting Financial Data |e3c4

e. Definitions |e3c5

f. Security |e3c6

g. Narrative Remarks |e3c7

3. Specific Instructions

|e3d

CONTRACT FUNDS STATUS REPORT |e3d|

|e3d|a

Item 1. Contract Number: |e3d2

Item 2. Contract Type: |e3d3

Item 3. Contract Funding For FY: |e3d4

Item 4. Previous Report Date: |e3d5

Item 5. Current Report Date: |e3d6

Item 6. Contractor: |e3d7

Name. address, zip code |e3d7a

Item 7. Program: |e3d8

Item 8. Appropriation: |e3d9

Item 9. Contract Target: |e3d10

Item 10. Cumulative Expenditures: |e3d11

Item 11. Funding Information: |e3d12

a. Line item: |e3d12a

b. Funding Code: |e3d12b

c. Funding: |e3d12c

d. Contract work authorized - Definitized: |e3d12d

e. Contract work auhorized - Not definitized: |e3d12e

f. Contract work auhorized - Subtotal: |e3d12f

g. Forecast - Defined work: |e3d12g

h. Forecast - All other work: |e3d12h

i. Subtotal - Forecast: |e3d12i

j. Total Requirements: |e3d|2j

k. Funds Carryover: |e3d|2k

l. Net funds required: |e3d|2l

Item 12. Commitments and Cumulative Expenditures: |e3d|3

Remarks: |e3d|4

CQFY : |e3d|4a

CQFY+1: |e3d|4b

CQFY+2: |e3d|4c

CQFY+3: |e3d|4d

CFY+1: |e3d|4e

CFY+2: |e3d|4f

CFY+3: |e3d|4g

CFY+4: |e3d|4h

|e3d|5

Form DD form 1856 page 1 of 1 |e3d|6

4816 JCN 14AUG70

|e3d|6a

4. Narrative Remarks |e3e

PROJECT 8622 (ONR) 2

From ONR Purchase Request No. xxxxx (ESU 69-119), 2a

Contract No. xxx 2b

DELIVERABLE ITEMS 2c

CONTRACT STATEMENT OF WORK 2d

REPORTS: 2e

```
':48|6', 08/|7/70 2349:22 JCN ;  ':JRNL|', 08/|4/70 |200:24 JCN ;
(|:zxbhjnD)
 (management:zxbbbgjD)
  .DPN=|; (technical:zxbbbgjD)
 (fund status:zxbbbgjD) .HED="48|6 JCN |4AUG70

";  .SNF=72;.MCH=65;.PGN=0;.DSN=|;.DPR=0;
```

WSD $48|7.| JNL 08/|7/70 |5|9:0| WE NEED A HARD COPY OPTION FOR MAIL$ 1

MGC $48|7.2 WSD 08/|7/70 |556:55 PLEASE PRINT AND ARCHIVE JOURNAL ENTRIES #48|4, 48|5,48|6$ 2

WSD $48|7.3 WSD 08/|7/70 |628:|O FILE JRNL| ENNTERED INTO JOURNAL AS 48|8$ 3

ARG BER BLP CHI DOC DIA DCE DGC EKV HAL JMY JBN JCN JDH JMH JMY JTM JRX KEV LSL MGC MEH MEJ MET MSC NDM VRB VDB WHP WKE WLB WSD $48|7.4 WSD 08/|7/70 |7|3:0| I PROPOSE MKING TE FOLLOWING CHANGES IN THE CONRTOL CHARACTERS FOR ALTER IN TODAS: CONTROL ← TO BECOME TERMINATE ALTR CONTROL ↑ TO BECOOME COPY TO END OF STATEMENT CONTROL Y TO BECOME DELETE UP TO AND INCLUDING $ 4

ARG BER BLP CHI DOC DIA DCE DGC EKV HAL JMY JBN JCN JDH JMH JMY JTM JRX KEV LSL MGC MEH MEJ MET MSC NDM VRB VDB WHP WKE WLB WSD $48|7.5 WLB 08/|8/70 04|9:33 * * * ROUNDTABLE DISCUSSION TODAY AT NOON * * *

SPECIAL GUEST: ART BUSHKIN -- MOVEMENT FOR A NEW CONGRESS. LETS TRY MAILING SANDWITCH ORDERS TO MEJ AS AN EXPERIMENT.$ 5

WSD $48|7.6 WLB 08/|8/70 0429:09 MAIL SYSTEM N/P'S. PLEASE NOTE THAT THESE AREN'T COMPLAINTS OR REQUESTS FOR IMMEDIATE ACTION, BUT MERELY SUGGESTIONS TO BE INCORPORATED INTO MAIL SYSTEM PLANNING DOCUMENTATION TO BE CONSIDERED ALONG WITH OTHER N/P'S IN SETTING GOALS AND PRIORITIES. (|) COUNTER WHICH OPERATES WHEN MESSAGES ARE BEING TRANSMITTED TO DISPLAYS SO THAT ONLY A SCREEN-LOAD IS TRANSMITTED INITIALLY, WITH SUBSEQUENT MESSAGES BEING SENT ONE-AT-A-TIME IN RESPONSE TO A CONTROL CHARACTER. (2) FACILITIES FOR SPECIFYING A GROUP OF MESSAGES IN COMMANDS LIKE DELETE; E.G. "ALL" "ALL BEFORE <DATE>" "<MSGNUM> THRU <MSGNUM>" ETC. (3) COMMAND FOR PRINTING A MSG OR MSGS (A LA QUICKPRINT). (4) COMMAND FOR APPENDING THE TEXT OF A MSG TO AN NLS FILE (AS A STATEMENT).$ 6

MEJ $48|7.7 WLB 08/|8/70 043|:|5 ROAST BEEF ON WHOLE WHEAT OR WHITE (NOT DARK OR RYE).$ 7

WSD $48|7.8 WLB 08/|8/70 0434:25 MORE MAIL N/P'S.. (5) MECHANISM FOR EDITING A SENT MESSAGE UP UNTIL THE TIME IT HAS BEEN RECEIVED (BY AT LEAST ONE PERSON OTHER THAN THE AUTHOR) -- THIS IMPLIES A MECHANISM FOR "TRANSPARENT" EXAMINATION OF OTHER PEOPLE'S MAIL (MAY- BE ONLY BY SENDER).$ 8

ARG BER BLP CHI DOC DIA DCE DGC EKV HAL JMY JBN JCN JDH JMH JMY JTM JRX KEV LSL MGC MEH MEJ MET MSC NDM VRB VDB WHP WKE WLB WSD $48|7.9 WLB 08/|8/70 0606:20 DOES ANYONE OBJECT TO (EVENTUALLY) CHANGING THE OPERATIONAL DEFINITION OF "INVISIBLE STRING" TO "A STRING OF BLANKS AND TABS BUT NOT INCLUDING CARRIAGE RETURNS? IF SO PLEASE SEND ME A SHORT MSG. THANX.$ 9

CHI $48|7.|0 WLB 08/|8/70 06|2:00 MY NEW FILE 'NIC|P' NOW FUNCTIONS CORRECTLY (NAMES-WISE) WITH ONLY A FEW KLUDGES, BUT I STILL CAN'T FIND A WAY TO MAKE IT WORK COMPLETELY CORRECTLY.$ |0

WSD $48|7.|| CHI 08/|8/70 08||:0| RE: 48|7.4, LETS MAKE ALTER THE SAME AS QED$ ||

MEJ $48|7.|2 CHI 08/|8/70 08|2:03 SANDWICH ORDER: HAM ON DARK, MILK. THANKS$ |2

WLB $48|7.|3 CHI 08/|8/70 08|4:28 RE 48|7.9: I SELDOM USE INVISIBLE AND NEVER USE IT FOR CARRIAGE RETURNS. PLEASE LET ME KNOW THE RESULTS OF THIS POLE$ |3

WSD $48|7.|4 WLB 08/|8/70 08|9:03 I'D LIKE TO SUGGEST THAT WE ALLOW TWO TYPES OF MSGS: (|) NORMAL MSGS WHICH ARE AUTOMATICALLY JOURNALIZED. (2) EPHEMERAL MSGS WHICH ARE NOT IMPORTANT ENOUGH TO JOURNALIZE -- I.E. THEY ARE THROWN AWAY WHEN EVERYONE HAS DELETED THEM. THESE COULD BE SPECIFIED BY A DIFFERENT -SEND- COMMAND OR, MORE CONVENIENTLY (PARTICULARLY WHEN MULTIPLE MESSAGES CAN BE SENT WITH ONE -SEND FILE- COMMAND), BY USING A DIFFERENT MSG DELIMETER FROM '$ |4

WSD $48|7.|5 WLB 08/|8/70 083|:32 (48|7,|4 CONT'D) I ACCIDENTALLY TYPED A -DOLLAR- (WELL NOT EXACTLY ACCIDENTALLY) AND SOMEHOW THE MESSAGE I WAS SENDING GOT TRUNCATED. -- HERE'S THE REST OF IT. CAN BE SENT WITH A SINGLE -SEND- COMMAND), BY USING A MESSAGE DELIMETER OTHER THAN -DOLLAR-. THE PURPOSE OF THIS IS TO PREVENT THE ACCUMULATION OF TOO MANY "BOLOGNA" SANDWITCH MSGS. $ |5

WSD $48|7.|6 WSD 08/|8/70 0838:34 MORE MAIL N/P'S. -ALLOW AN OPTION SIMILAR TO THAT IN KDF FOR ACCESSING, DELETEING, SENDING, PRINTING, ETC., MSGS FOR INITIALS OTHER THAN YOU ARE LOGGED IN UNDER. -CHECK INITIALS FOR VALIDITY -- IF UNKNOWN: --DO NOT SEND TO UNKNOWN INTIALS. --IF SENDER IS UNKNOWN, ASK FOR HIS FULL NAME. $ |6

WSD $48|7.|7 WSD 08/|8/70 0840:29 CHUCK TOLD ME ABOUT THE 2000 CHARACTER LIMIT. $ |7

CHI $48|7.|8 WLB 08/|8/70 0846:59 I SUGGEST ONE OF THE FOLLOWING TO SPEED UP NLS ENTRY TIME: -HAVE A NLS ENTRY COMMAND (OR OPTION) WHICH RESULTS IN ENTRY WITHOUT LOOKING FOR MAIL. -KEEP A BIT TABLE IN THE MAIL SYSTEM WHICH IS ALWAYS UPDATED TO INDICATED WHETHER A USER HAS ANY MAIL (ACTUALLY A COUNTER TABLE WOULD BE NEEDED); THUS, IF THERE IS NO MAIL, NO SEARCHING IS NECESSARY. $ 18

WLB $48|7.|9 WLB 08/|8/70 0847:45 TELEPHONE INSTALLATION WEDNESDAY 8-|0 AM. $ 19

WLB $48|7.20 WLB 08/|8/70 0849:46 THURSDAY AUGUST 20 PHONE CALL ||-2 DR. MCKEE 2:30 DR. CHAPMAN 3:30 $ 20

MEJ $48|7.2| HAL 08/|8/70 0909:08 NO SANDWICH FOR ME TODAY... I BROUGHT MY OWN. THANK YOU, HARVEY$ 2|

WSD $48|7.22 HAL 08/|8/70 09||:26 FILE DIRECTORY INFO HARVEY.$ 22

WLB $48|7.23 HAL 08/|8/70 09|4:23 I SENT MY (LACK OF) SANDWICH ORDER VIA THE MAIL WAS WONDERING, HOWEVER, IF WE REALLY WISH TO LITTER THE JOURNAL WITH OUR SANDWICH WRAPPINGS AND OTHER TRASH. AUGMENTEDLY, HARVEY $ 23

HAL $48|7.24 WLB 08/|8/70 0922:38 RE (48|7,23). I'VE ALREADY COMMENTED ON THIS TO WSD. BUT UNTIL SOMEONE HAS TIME TO CHANGE IT . . . . (LIKE I'VE ALREADY STARTED USING THE MAIL TO SEND MYSELF REMINDERS) $ 24

ARG BER BLP CHI DOC DIA DCE DGC EKV HAL JMY JBN JCN JDH JMH JMY JTM JRX KEV LSL MGC MEH MEJ MET MSC NDM VRB VDB WHP WKE WLB WSD $48|7.25 MEJ 08/|8/70 0926:56 YOU WOULD BE OUT OF LUCK SOME TUESDAY IF I COULDN'T GET ON INE, WOULDN'T YOU?$ 25

WLB $48|7.26 MEJ 08/|8/70 0927:59 DO YOU WANT ME TO GET A SANDWICH FOR THE GUEST? IF SO, WHAT KIND?$ 26

WSD $48|7.27 MEJ 08/|8/70 0944:|5 CAN WE PLEASE PLEAE PLEASE DEVISE SOME WAY OF BY-PASSING THE MAIL MESSAGES AS WE ENTER TODAS AND NS, IF WE CHOOSE TO DO SO? IT TAKES TOO MUCH TIME TO WAIT FOR THE WHOLE LISTT EACH TIME WE GO IN AND OUT OF A SYSTEM. THANK YOU TO THE NTH POWER. SIGNED MIL$ 27

WSD $48|7.28 MEJ 08/|8/70 0946:50 CAN WE ←LEASE PLEASE PLEASE DEVISE SOME WAY OF BEING ABLE TO CHOOSE THAT WE BY-PASS THE MAIL MESSAGES AS WE ENTER TODAS AND NLS? IT TAKES TOO MUCH TIME TO WAIT FOR THE WHOLE LIST OF MESSAGES THAT WE HAVE READ DOZENS OF

TIMES BEFORE, EACH TIME BE ↑↑↑WE GO IN AND OUT OF A SYSTEM. THANKS TO THE NTH POWER.$ 28

WSD $48|7.29 MEJ 08/|8/70 0950:34 CAN WE PLEASE PLEASE DEVISE SOME WAY OF HAVING THE CHOICE OF BY-PASSING THE MAIL MESSAGES AS WE ENTER TODAS OR NS? IT TAKES TOO MUCH TIME TO RE-READ ALL THOSE MESSAGES EACH TIME WE GO IN AND OUT OF A SYSTEM. THANKS TO THE NTH POWER.$ 29

WLB $48|7.30 MGC 08/|8/70 0953:33 RE 48|7.9 WHY? IT FURTHER CONFUSES TERMINOLOGY -- MAKES USE OF "INVISIBLE" ILLOGICAL. WHAT WOULD IT GAIN? $ 30

WLB $48|7.3| MGC 08/|8/70 0955:26 I VOTE FOR NOT LITTERING JOURNAL WITH TRIVIA OF NOT HISTORIC INTERESTS$ 31

WLB $48|7.32 WLB 08/|8/70 0956:40 BRING BOAT IN WEDNESDAY FOR CHARLES LUTZ. $ 32

WLB $48|7.33 WLB 08/|8/70 0957:|3 VOTER REGISTRATION THURSDAY ||-|:30. $ 33

WSD $48|7.34 CHI 08/|8/70 |040:52 PLEASE READ 48|7.|8 FROM WLB CONCERNIG THE MAIL SYSTEM. WHAT DO YOU THINK ABOUT THE BIT TABLE?$ 34

WSD $48|7.35 MGC 08/|8/70 |04|:|2 4807 DOES NOT COVER THE PROBLEM OF FILES ALREADY PROCESSED AND FROZEN BUT NOT PRINTED OR BACKED UP ON TAPE THAT GO BAD IN THE INTERIM.EG. 48|6 $ 35

WSD $48|7.36 CHI 08/|8/70 |043:44 HOW HARD WOULD IT BE TO PUT IN A MAIL COMMAND TO TYPE A GIVEN MESSAGE (WHETHER OR NOT ITS IN THE MAIL FILE) SO PEOPLE CAN FOLLOW REFERENCES TO OTHER MESSAGES?$ 36

CHI $48|7.37 WSD 08/|8/70 ||||:58 CHUCK. I THINK THAT IF YOU LOOK AT THE TODAS CHAACTER SET, PARTICULARLY WITH RELATIONSHIP TO THE VARIOUS TERMINALS, YOU WILL NOT FIND THE SITUATION SO SIMPLE. FOR EXAMPLE, THE BAKCSPACE KEY ON TERMINET, 37 TTY, ETC. SENDS A CONTROL H, WHICH IS USED AS COPY TO END OF LIEN BY QED. I WOULD WANT TO GIVE UPMY BACKSPACE KEY. THERE ARE OTHERS TOO. THE TODAS CHARACTER SET IS SOMEWHAT FUNNY BECAUSE AN ATTEMPT IS MADE TO ACCOMIDATE 6 DIFFERENT DEVICES CONVENIENTLY. WE GET INTO DIFFICULTY BECAUSE (|) PEOPLE USE TODAS FROM WRONG DEVICES(EG TERMINET FROM DISPLAY), AND (2) THE ALTER CHARACTER SET HAS NOT BEEN TERRIBLY WELL THOUGHT OUT. I AM IN FAVOR OF STANDARDISING IT (AND HAVING A CONCENSUS ON IT), BUT I THINK THAT IT WILL NOT BE WORTH IT TO MAKE IT MATCH EXACTLY QED. P.S. MAYBE A UNIVERSAL

CHARACTER SET PLUS TRMINAL VARIATIONS WOULD SOLVE SOME PROBLEMS.$ 37

WSD $48|7.38 WLB 08/|8/70 ||20:|9 AND MORE -TO SPEED UP ENTRY INTO NLS, NEED TO KEEP A COUNTER OF MESSAGES WAITING FOR EACH USER SO THAT IF NO MSGS ARE PRESENT, THERE IS NO NEED TO SCAN THE FILE. --COULD BEEF THIS UP IN CONJUNCTION WITH DEFINING SETS OF SENDERS SO THAT EACH USER -AUTOMATICALLY- GETS MSGS ONLY FROM CERTAIN PEOPLE. THE REST HE CAN GET AT HIS LEISURE AND SPECIFIC REQUEST. $ 38

MGC $48|7.39 WLB 08/|8/70 ||23:26 RE (48|7,3|) I AGREE BUT THINK THAT SOLUTION IS TO PERMIT NON-JOURNALIZED MAIL RATHER THAN TO PROHIBIT CASUAL COMMUNICATION.$ 39

WLB $48|7.40 WSD 08/|8/70 ||24:23 WALT RE SUGGESTIONS. ALL SEEM SOUND (EXCEPT FOR 48|7.|4, WHICH I WILL COMMENT ON), AND MANY ARE POSIBILITIES WHICH HAVE AND ARE BEING CONSIDERED FOR FUTURE IMPROVEMENTS. I APPRECIATE THEM. $ 40

MGC WSD $48|7.4| WLB 08/|8/70 ||26:36 RE NON-JOURNALIZED MAIL WHAT IS THE TRADEOFF BETWEEN KEEPING ALL MAIL IN THE JOURNAL INCLUDING TRANSIENT TRIVIA ON THE ONE HAND, AND THROWING THIS TRASH AWAY THUS PREVENTING FUTURE STUDY OF HOW THE MAIL/JOURNAL SYSTEM WAS ACTUALLY USED? ALSO WHAT IS THE TRADEOFF INVOLVED IN DOING NOTHING BUT SENDING MAIL TO EACH OTHER ALL DAY AND DOING OTHER CONSTRUCTIVE WORK?$ 4|

WSD $48|7.42 WLB 08/|8/70 ||28:52 MAYBE STANDARD HEADER FOR MAIL MSGS SHOULD HAVE LIST OF ALL PEOPLE AND SETS TO WHICH THE MSG WAS ADDRESSED ALONG WITH AN INDICATION OF WHICH OF THESE HAVE ACTUALLY READ THEM. $ 42

WLB $48|7.43 WSD 08/|8/70 ||3|:3| WALT...RE 48|7.|4 THE DISCARDING OF IRRELEVANT INFOR- MATION IS ONE OF THE OUTSTANDING CONFRONTING DIALOGUE SUPPORT SYSTEM. I CURRENTLY DO NT KNOW WHAT IS IRRELEVANT, AND I DON'T KNOW HOW TO DECIDE WHAT IS IRRELEVANT. BALOGNA SANDWICHES MAY SEEM OBVIOUSLY IRRELEVANT, UNLESS YOU CONSIDER THE SCOPE OF DIALOGUE TO INCLUDE PERSONALITIES AND EVENTS AND RELATIONSHIPS, WHCH I DO. I THINK THAT THE PROPER APPROACH FOR AS LONG AS IT IS FEASIBLE IS TO CAPTURE AS MUCH INFORMATION AS WE CAN, AND PROVID TOOLS FOR SIFTING OUT THE UNINTERESTING GRAINS. THE DIALOGUE SYSTEM SEEMS TO ME TO BE A POTENTIALLY MENACING AND FRIGHTENING THING IF THERE IS NO HUMAN AND FREE ELEMENT TO IT, WHICH IS WHY I AM SO CONCERNED ABOUT MAKING IT A 'FRIEND'. P.S. PLEASE BE CAREFUL...THE LAST TWO MESSAGES (48|7,|6, 48|7.|7 WERE SENT TO ME WITH MY INITIALS IN THE HEADER, WHICH MEANS YOU PROBABLY ENTERED UNDER ME TO CHECK PREVIOUS ONES, AND THEN FORGOT TO RE-ENTER UNDER WLB BEFORE

SENDING MORE$ 43

WSD $48|7.44 WLB 08/|8/70 ||33:52 RE (48|7,40) THANKS -- LET ME KNOW IF MY COMMENTS ARE GETTING TRIVIALLY REPETITIVE OF THINGS YOU'VE ALREADY INCORPORATED INTO MAIL SYSTEM PLANS. I'LL ASSUME THAT THE SUGGESTIONS ARE USEFUL UNTIL TOLD OTHERWISE.$ 44

ARG BER BLP CHI DOC DIA DCE DGC EKV HAL JMY JBN JCN JDH JMH JMY JTM JRX KEV LSL MGC MEH MEJ MET MSC NDM VRB VDB WHP WKE WLB WSD $48|7.45 WSD 08/|8/70 ||38:50 YOU MAY AVOID SEEING YOUR MAIL BY TYPING A RUBOUT IMMEDIATELY FOLLOWING YOU USER NAME IN ENTERING NLS/TODAS. THERE IS SOME DANGER TO YOU IN DOING THIS, SO A BETTER WAY IS DELETING IT AFTER YOU HAVE READ IT. I RECOGNISE THE NEED FOR HARD COPY, AND THERE ARE CURRENTLY 2 WAYS OF GETTING IT (|) THE MAIL FILE WILL BE ENTERED INTo THE JOURNAL, AND BE AVAILIBLE THE DAY AFTER A MESSGE IS SENT (THE MESSGE NUMBER IS THE NUMBER OF HE JOURNAL FILE AND THE STATEMENT NUmBER OF HE MESSAGE WITHIN THAT FILE) (2) YOU MAY GO TO A TTY AND GET YOUR MAIL PRINTED THERE.$ 45

CHI $48|7.46 WSD 08/|8/70 ||50:4| WILL READ 48|7.|8 WHEN IT IS IN JOURNAL. IT WOULD BE PRETTY EASY TO PUT IN PRINT MESSAGE COMMAND, AND WAS ON MY LIST OF THINGS TO DO$ 46

WLB $48|7.47 WSD 08/|8/70 ||53:4| YES, YES, I KNOW. I HAD THOUGHT OF COUNTERS ET. AL., WITH HE FEELING THAT FOR HE TIME BEING IT WAS NOT WORHT MY TIME. I HAVE BEEN DOING NOTHING BU ANSWERING MAIL FOR THE LAST HOUR...HELP!$ 47

WLB $48|7.48 WSD 08/|8/70 ||59:|8 AS AN ADD3NDUM TO 48|7.47, I MEAN THAT THOSE THINGS, AND MANY MORE, ARE ALL WORTH WHILE DOING, BUT MY OTHER COMMITMENTS WILL NOT ALLOW ME TO SPEND TIME ON THEM NOW. WE NEED A MAIL PROGRAMMER...WALT?? YOU CAN PROGRAM, CAN'T YOU??$ 48

CHI $48|7.49 WIB 08/|8/70 |420:29 SUGGESTIONS FOR EVENTUAL EXPANSION OF LEVEL CLIPPING AND LINE TRUNCATION CONCEPTS: -SHOULD BE ABLE TO SPECIFY -LEVEL N- THRU -LEVEL M- AS WELL AS -LINE I- THRU -LINE J- WHERE O .LE N .LE M AND O .LE I .LE J. -ALSO SHOULD BE ABLE TO SPECIFY STATEMENT K OF PLEX THRU STATEMENT L OF PLEX WHERE O .LE K .LE L. $ 49

HAL $48|7.50 SST 08/|8/70 |429:|6 RE (48|7,23) -- SEE (48|7,43) $ 50

HAL $48|7.5| WLB 08/|8/70 |43|:52 (48|7,50) IS FROM ME -- I GOOFED IN MAIL SYSTEM ENTRY SEQUENCE.$ 5|

WSD $48|7.52 WLB 08/|8/70 |434:42 RE (48|7,43) -- I SHARE YOUR FEELINGS COMPLETELY. --SORRY ABOUT FORGETTING TO REENTER THE MAIL SYSTEM.$ 52

WSD $48|7.53 WLB 08/|8/70 |442:32 I'M GETTING THE FEELING ALSO THAT TOO MUCH COMMUNICATION IS AS BAD AS TOO LITTLE(?) I'D LOVE TO HELP PROGRAMMING, MY NIC NEEDS ME. AS I SAID BEFORE, THIS IS JUST A CONTRIBUTION TO THE MAIL SYSTEM NEEDS/POSSIBILITIES "STUDY". HERE'S ANOTHER:

-IT WOULD BE NICE TO BE ABLE TO SCHEDULE THE APPEARANCE OF NOTICES IN THE MAIL -- I.E. SPECIFY THE TIME AT WHICH THEY CAN FIRST BE DELIVERED AND A TIME AFTER WHICH THEY SHOULD GO AWAY AUTOMA- TICALLY, EVEN IF NOT SPECIFICALLY DELETED.

I REALLY DON'T EXPECT YOU TO REPLY TO ALL THESE PIPE DREAMS INDIVIDUALLY, UNLESS THERE IS SOMETHING WHICH REALLY NEEDS CLARIFICATION, ETC. ---- THIS REALLY ISN'T A WASTE OF TIME, BECAUSE WE NEED TO LEARN HOW TO USE THIS NEW TOOL SO AS NOT TO BE USED BY IT $ 53

DCE $48|7.54 WLB 08/|8/70 |448:47 CRUDE AS IT IS, THE MAIL SYSTEM IS BEGINNING TO SHAPE UP AS A POTENTIALLY VERY POWERFUL TOOL. IT IS APPROACHING, MAYBE EVEN AT, THE POINT OF BEING COMPETITIVE WITH PENCIL AND PAPER FOR SPEWING FORTH NEEDS/POSSIBILITIES SUGGESTIONS TO VARIOUS PEOPLE. IT WILL BE INTERESTING TO SEE IF IT CAN BE USED AS POWERFULLY ON THE OTHER END. BILL DUVALL HAS DONE A VERY GOOD FIRST PASS JOB IN THIS SHORT TIME.$ 54

WSD $48|7.55 MGC 08/|8/70 |637:43 USE 48|9 FOR NEXT MAIL NUMBER. WE HAVE USED 4820 FOR ANOTHER JOURNAL ENTRY. HEREAFTER THE NEXT NUMBER NOT YET ASSIGNED WILL BE WILL BE KEPT IN FILE (JO):NUMB. $ 55

MSC WHP CHI $48|7.56 WSD 08/|8/70 |729:54 LOAD OF THIS AFTERNOON NOGOOD. I THINK THAT RECINT STILL HAS 7 CHARACTER SYMBOL (TCACMPL) IN IT. CHECK ROUTINE RLSSOM.$ 56

WSD $48|7.57 JCN 08/|8/70 |800:03 Journal file :4820 awaits your review. It is a draft of clerical procedures for Journal entry. both for regular entries and for mail, which you are still handling. Please send comments, if any. We plan to expand the tape duplication and the hardcopy portions. Also. 48|4 through 48|6,48|8 and 4820 are all on Journal tape now$ 57

WHP CHI $48|7.58 WLB 08/|8/70 |802:05 I HAVE A TENTATIVE HYPOTHESIS ON WHAT IT IS THAT FUCKS UP JUMP-TO-LINK IN MY FILE.

EVERYTHING SEEMS TO BE FINE UNTIL A PATTERN IS EXECUTED WHICH MATCHES ONE OF THE NAME DELIMETER CHARACTERS IN THE FILE. THEREAFTER, THERE IS ASTRONG LIKELIHOOD OF THIS PECULIAR AMNESIA TO OCCUR (THE MATCH DOES NOT HAVE TO OCCUR IN THE STATEMENT WHOSE NAME BECOMES FORGOTTEN.$ 58

WSD $48|7.59 WLB 08/|8/70 |82|:|6 IT WOULD BE NICE IF ONE COULD BACKSPACE WHEN TYPING IN THE ADDRESS FIELD OF A MSG. $ 59

CHI WHP $48|7.60 WLB 08/|8/70 |824:|7 I WOULD REALLY APPRECIATE YOUR HELPING WITH ONE (OR PREFERABLY BOTH) OF THE FOLLOWING: -FIND THE BUG WHICH IS CAUSING HAVOC AS BITCHED ABOUT BEFORE. -MAKE IT POSSIBLE TO USE PARENTHESES WITHIN LINKS -AND- MAKE THE C/A-IN-A-LINK BUFFER LARGER. THANKS $ 60

CHI $48|7.6| WLB 08/|8/70 |829:05 I'D LIKE TO SUGGEST THAT THE "TRANSFER TO WORKING COPY" MESSAGE (AND OTHERS LIKE IT) BE POSTED IN THE NAME REGISTE (OR THE LIKE) SO THAT THE SCREEN DOESN'T HAVE TO BE BLANKED OUT FOR SUCH A SHORT MESSAGE.$ 6|

WHP CHI $48|7.62 WLB 08/|8/70 |850:|4 MORE ON THE MYSTERIOUS LINK GAMBIT: --THE FUCKUP GENERALLY SEEMS TO ARISE DURING THE THIRD EXECUTION OF A PATTERN WHICH MATCHES SOME STATEMENT'S NAME DELIMETER. THE PATTERNS NEED NOT BE THE SAME, BUT THE BEHAVIOR IS SLIGHTLY DIFFERENT FOR DIFFERENT COMBINATIONS OF PATTERNS. --A BRILLIANT FLASH HIT ME -- WHY NOT USE STATEMENT NUMBERS RATHER THAN STATEMENT NAMES IN THE LINKS!! WHY NOT INDEED. INSTEAD OF JUST NOT FINDING THE STATEMENT, NLS CRASHED ITSELF -- SOMETIMES WITH AN OOPS AND OTHER TIMES BY FREEZING UP WITH COMMAND FEEDBACK ON THE SCREEN BUT NO TEXT, SUCH THAT I HAD TO ADVISE MYSELF RUBOUTS TO RECOVER. THIS PARTICULAR COMBINATION OF BUGS HAS ME COMPLETELY STYMIED, AND I HAVE LOST SEVERAL VALUABLE DAYS OF WORK TRYING FRUITLESSLY TO GET AROUND THEM. ROTS OF RUCK IN FINDING THEM$ 62

WHP CHI $48|7.63 WLB 08/|8/70 |853:54 PS.. THE FILE USING NSTATEMENT NUMBERS IN UNDER (NL):ANOTHER MESS.$ 63

WLB $48|7.64 WSD 08/|8/70 |945:47 RIGHT..BUT YOU REALLY DON'T HAVE TO, SINCE ANYTHING WHICH IS NOT INITIALS IS DISCARDED (OF COURSE THIS DOES NOT ALLOW YOU TO "DE-ADDRESS" MESSAGES)$ 64

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:48|7, 08/|9/70 |044:57 JCN ;  ':MAIL', 08/|8/70 20||:25 WSD ;
.HED="48|7 JCN |9AUG70
Mail File";  .SNF=72;.MCH=65;.PGN=0;.DSN=|;.DPR=0;
```

CONVERSATION between WSD and KEV concerning program for securing File Directories, 5 Aug 1970. |

WSD - "Is there a program I can use, or a way to get easily a printout of everyone's file directory?" |a

KEV - "First of all, identify yourself." |b

WSD - "The Phantom." |c

KEV - "Dear Phantom, no." |d

WSD - (Does that make a difference?) |e

KEV - "No, it does not make a difference. There is still no way." |f

WSD - "Why not?" |g

KEV - "I don't know, but I'll consider writing one. They are loading now and you shouldn't be running, anyway." |h

WSD - "Who is running??? I'm just talking to you...." |i

KEV - "The Phantom is running." |j

WSD - "Yes, yes. (Hee Hee Ehee!) It is very important that we have a way to look at file directories...in fact, you might say urgent..." |k

KEV - "There is a way to get a listing by user of the number of files and the number of blocks used by those files. Is that sufficient?" |l

WSD - "No. Can you write me a nice little program???" |m

KEV - "It will cost you 3 abolone." |n

WSD - "What's an abolone...do you mean abalone???" |o

KEV - "Yes." |p

WSD - "Right on...It's not worth it, but...anything for ARC." |q

KEV - "I'll get to it soon. Why do you need it?" |r

WSD - "Read file (Journal,4805,) and you will see that we need some way to search all file directories for files beginning with ':JRNL'." |s

KEV - "Then all you want is a program that will go thru all directories to find such files. What do you want in the way of output?" |t

WSD - "Usernames are fine...and by the way, the file is 4804, not 4805, in fact. Usernames and file names would be perfect." |u

KEV - "Do you want a listing or a program that can be called dynamically?" |v

WSD - "A program." |w

KEV - "Is the output from this program to be a printout or a file that consists of the needed information?" |x

WSD - "A QED file is fine." |y

KEV - "OK. Will do as soon as possible." |z

```
':48|8', 08/17/70 1625:59 WSD ;  (DUVALL)':FDPROG', 08/11/70 1807:09 WSD
; .HED="48|8 WSD 17AUG70
";  .SNF=72;.MCH=65;.PGN=0;.DSN=|;.DPR=0;
```

JNL $48|9.| JNL 08/|9/70 |009:40 TJIS IS A TEST MESSAGE$ 1

ARG BER BLP CHI DOC DIA DCE DGC EKV HAL JMY JBN JCN JDH JMH JNL JTM JRX KEV LSL MGC MEH MEJ MET MSC NDM VRB VDB WHP WKE WLB WSD $48|9.2 WSD 08/|9/70 |028:39 DO TO THE FILE CRASH, ALL MESSAGES FROM 48|7.46 THROUGH 48|7.64 WERE DELETED FROM THE MAIL FILE. THESE MESSAGES ARE, HOWEVER, AVAILIBLE IN THE JOURNAL FILE (JOURNAL):48|7. THE MESSAGE NUMBERS CORRESPOND TO STATEMENT NUMBERS IN THE FILE. ALSO, YOU MAY GET SOME MESSAGES WHICH YOU HAVE DELETED. SORRY, BUT YOU WILL HAVE TO DELETE THEM AGAIN$ 2

ARG BER BLP CHI DOC DIA DCE DGC EKV HAL JMY JBN JCN JDH JMH JNL JTM JRX KEV LSL MGC MEH MEJ MET MSC NDM VRB VDB WHP WKE WLB WSD $48|9.3 WSD 08/|9/70 |047:42 NEW FEATURES IN MAI: (|) WRITE <MESSAGE NUMBER> <CHARACTE. TO FILE <FILENAME>. WRITES THE INDICATED MESSAGE ONTOTHE INDICATED FILE, WHICH MAY BE THE TELETYPE. THE DESTINATION FIELD IS INCLUDED WITH HE MESSAGE, SO YOU MAY SEE TO WHOM IT IS ADDRESSED. THE MESSAGE IS WRITTENIN A FORMAT WHICH IS SUITABLE FOR INSERT QED, SO YOU MAY INSERT IT INTO A FILE IF YOU WISH. THIS COMMAND ALLOWS YOU ACCESS ONLY TO MESSAGES WHICH HAVE BEEN SENT, BUT NOT ENTERED INTO THE JOURNAL. (2) INITIALS ARE CHECKED FOR VALIDITY. A ? IS TYPED IF ILLEGAL INITIALS ARE ENTERED IN A DESTINATION FIELD, AND THE INITIALS ARE IGNORED. (3) RUBOUT NOW TAKES YOU TOTHE COMMAND ENTRY LEVEL IN MAIL, AND TWO RUBOUTS TAKE YOU BACK TO NLS.TODAS OR EXEC. (4) ILLEGAL NLS CHARCTERS ARE NOT ALLOWED IN MESSAGES.. THEY ARE DELETED. (5) THE BACKSPACE KEY MAY BE USED DURING ENTRY ON ALL DEVICES. PREVIOUSLY IT WAS USABLE ONLY FROM DISPLAYS.$ 3

WSD $48|9.4 MGC 08/|9/70 ||0|:40 48|7 ON TAPE, IN HARD COPY$ 4

WSD $48|9.5 HAL 08/|9/70 ||08:37 CAN'T SEE BEGINNING OF THE LONG MESSAGE YOU SENT PERHAPS A NEEDED FEATURE WOULD BE TO DISPLAY ONLY |0 LINES AT A TIME WITH A CONTINUE CONTROL. HARVEY$ 5

WSD $48|9.6 MGC 08/|9/70 ||||:49 DID YOU HAVE :GETTER BACKED UP ANYWHERE?$ 6

$48|9.7 WLB 08/|9/70 ||54:2| MARY, PLEASE GO THROUGH KDF FOR BASS, MSR, AND LAMPSON AND ARCHIVE ALL FILES WITH NAMES BEGINNING WITH 'NF'. AS SOON AS YOU ARE SURE THAT THEY ARE ADEQUATELY BACKED UP ON TAPE, DELETE THE KDF COPIES -- THIS WILL FREE UP A LOT OF STORAGE SPACE. THANX.$ 7

WSD $48|9.8 MGC 08/|9/70 |204:43 HAL SAYS A BRANCH IN 4809 AS IT APPEARS IN HARD COPYIS MESSED UP (MATERIAL DELETED IN FILE

CLEANUP REPLACED BY ASTERISKS) AND THAT THERE IS A GOOD COPY IN HIS KDF CALLED ARCHI. HE WOULD LIKE US TO REPLACE 4809 WITH A GOOD COPY -- DO YOU WANT ME TO DO THAT OR ENTER A NEW COPY AS 4821?$ 8

CHI WHP $4819.9 WLB 08/19/70 1306:21 REVISED HYPOTHESIS. I FINALLY FIGURED OUT A WAY TO DO WHAT I WANT TO DO WITH NAMES THAT DIDN'T INVOLVE MATCHING THE NAME DELIMETERS WITH ANY PATTERN, BUT THAT DID STILL INVOLVE MATCHING THE TEXT OF THE NAME FIELD ITSELF. THIS BOMBS OUT IN THE SAME WAY AS BEFORE, SO THE PROBLEM MAY ARISE FROM MATCHING THE NAME RATHER THAN THE NAME DELIMETERS. --- ARE FUNNY THINGS LEFT IN THE SDB AFTER CONTENT ANALYSIS WHICH COULD BE GIVING THE NAME LOCATING ROUTINE TROUBLE?$ 9

WHP CHI $4819.10 WLB 08/19/70 1319:06 I TRIED THE NEXT OBVIOUS EXPERIMENT: -I TOOK THE C/A PATTERNS OUT OF MY LINKS AND THEN 'MANUALLY' COMPILED THE PATTERNS BEFORE DOING THE JUMP TO LINK. -MUCH TO MY SURPRISE, EVERYTHING WORKED FINE.$ 10

CHI WHP $4819.11 WLB 08/19/70 1331:16 I FINALLY FOUND A WAY OF LIVING WITHIN THE SYSTEM: --I JUST STOPPED USING STATEMENT IDENTIFIERS IN LINKS. OF COURSE TIME MAY SHOW THAT AS A RESULT WHEN I OPERATE ON FILES, THEY THEY MAY BE CRAPPED UP.$ 11

WKE $4819.12 WLB 08/19/70 1551:30 VISITOR MONDAY AT 2PM. WILL NEED ACCESS TO SYSTEM FOR A WHILE BETWEEN 2-3 FOR A DEMO. DON'T NEED EXCLUSIVE USE OF SYSTEM, JUST ACCESS.$ 12

WKE DCE WSD $4819.13 WLB 08/19/70 1554:28 I WOULD LIKE TO SUGGEST THAT WE SET UP A TYPEWRITER TERMINAL SOMEWHERE IN THE COMMONS AREA EXCLUSIVELY FOR USE IN SHORT ACTIVITIES. I HAVE IN MIND PARTICULARLY USE FOR SENDING AND RECEIVING MAIL MESSAGES.$ 13

WSD DIA $4819.14 WKE 08/19/70 1822:08 SYSTEM WILL BE DOWN FROM 10:00 PM TONIGHT UNTIL ABOUT 3:00 AM TOMORROW MORNING FOR DRUM SYSTEM WORK$ 14

WSD $4819.15 MGC 08/19/70 1828:39 SINCE WE CAN SEE MAIL BY GOING INTO SUBSYSTEM, IT SEEMS A WASTE OF SYSTEM OF SYSTEM TIME TO WAIT WHILE MAIL IS SEARCHED FOR EACH TIME WE GO INTO N NLS OR TODAS -- DON'T SEE ANY VALUE IN SHOWING IT THERE -- IT DOESN'T FORC FORCE USE OF MAIL SINCE ONE CAN CONSISTENTLY USE RUBOUT: JUST MAKES AN ALREADY HIGH FRUSTRATION (AT SYSTEM SLOWNESS) LEVEL HIGHER. $ 15

WSD $4819.16 MGC 08/19/70 1830:38 DID YOU GET MY PREVIOUS MESSAGE RE :GETTER?$ 16

WLB $48|9.|7 BLP 08/|9/70 |842:52 YES I HAVE A SLIGHT BJECTION.$ |7

MGC $48|9.|8 WSD 08/|9/70 |842:56 I'LL GET GETTER TONIGHT..BY 2|00 OR SO..I HAVENT TIME TO DO IT NW..SORRY$ |8

WSD $48|9.|9 MEJ 08/|9/70 |900:30 cannot catch bank change for friday aug 2| check. Check will be sent here with other chcks for you to pick up. if this not OK, let me know what you want done. -- Mil.$ |9

WLB $48|9.20 DCE 08/|9/70 |946:29 Referring to your message 48|7.9 -- Yes, I object to changing "invisible string" so that it excludes carriage returns. I would agree to adding a new entity, however; I have made much use in the past of "GAP" as the equivalent of our current Invisible String, but I also specified a second entity called "HGAP" (horizontal gap), composed of any number of spaces or tabs (to accomodate the same need which you evidently feel).

Incidentally, I found use for four other GAP-type entities: "LGAP" (line gap), which is a GAP containing at least two carriage returns; "VGAP" (vertical gap), which is that part of a GAP beginning with the first carriage return and ending with the last carriage return; "NVGAP" (normalized vertical gap), which is a vertical gap with all of th tabs and spaces lying between the delimiting carriage returns deleted; and "NGAP" (see the following) -- Any gap may be broken down into three components: GAP| = HGAP| VGAP HGAP2. The is use for "NGAP" (normalized gap), which for this general gap listed above would consist of NGAP| = NVGAP HGAP2.

I feel that within our system all gaps should automatically be normalized (particularly in TODAS, where this is the only reasonable assumption a user canmake).

In summary, my direct response to your message is that if it is useful, we should add an HGAP entity (given whatever entity name seems reasonable), and keep the current GAP as is. (The rest of the above discussion is to put these other gap considerations on the record.)$ 20

MGC $48|9.2| WSD 08/|9/70 2|00:50 GETTER IS BACK$ 2|

MEJ $48|9.22 WSD 08/|9/70 2|02:00 CHECK SENT THERE WILL BE FINE...THANX$

22

```
':48|9', 08/20/70 |345:44 MGC ;   ':MAIL', 08/|9/70 2|||:56 WSD
;.HED="48|9 MGC 20/A/U/G70
Mail File";  .SNF=72;.MCH=65;.PGN=0;.DSN=|;.DPR=0;
```

4820 MGC |8AUG70
Notes from WSD/JCN meeting 8/|7/70 re: Journal Entry procedures

(jnlentry) Steps for clerical entry into the Journal: |

Enter System as Journal (password is ARC), setting Executivity to -| and change drum assignment to 600. |a

Run file :GETTER, This will find names of user's files awaiting Journal entry. |b

:GETTER asks for the name of a temporary file in which to put the file names it finds. |b|

After running :GETTER, go into QED and read from the temporary file, then examine by typing "|,$/". |b2

The following is representative of what you will get back: |b3

(norton):jrn1| |b3a

(duvall):jrn12 |b3b

(caldwell):jrn1p48|8 |b3c

This last example is mail still being processed for Journal, but with the Journal number already assigned. For a while, WSD will keep this part of the procedure (mailentry) active himself. |b3c|

Each file found is now entered into the Journal with the following procedures: |c

Enter TODAS, using your own initials, unless entering mail-type Journal entries. In that case, initials are: "JNL". For rest of that sequence, see (mailentry) below. |c|

Load the first file awaiting entry, print statement 0, looking for existence of .hed="xxxxx"; and other important data, such as distribution instructions |c2

If .hed="xxxxx"; is found, proceed to next step, |c2a

If not, enter .hed=""; no text is necessary in header for this purpose, just the directive |c2b

Execute viewchange Shift Case Off CA CA |c3

Execute merge after statement 0, merging from Journal :MJ,

branch :mj, with viewspecs set at w (all/all) |c4

Execute text :mj |c5

This will ask for JJJJ iiii DDMMMYY |c5a

You give next Journal number (by refering to master list of numbers assigned so far),
Your initials and date such as: |7AUG70 then a ca |c5a|

If TODAS types a 2, it has not found your .hed=""; or you forgot that step, if so, start over by reloading the file to be Journalized and merging, etc. |c5b

Next TODAS asks for the Journal Number again, which you offer. it echoes the number back after your CA. Another CA verifies it is ok. Any other character sends it back for another try at getting the number from you. |c5c

Note that the :MAIL characters that TODAS types to you are not really part of its message to you..(it is trying to output to :MAIL..when you give it the new Journal number, it takes that to be the file name, instead of :MAIL.. it types the : just before the new Journal file number. All it wants from you is the number itself. |c5c|

Then TODAS does a file cleanup and deletes the merged branch (:mj) after leaving itself with the normal character set redefined. |c5c2

At this point, go to the Executive level and set the new Journal file to permanent. private access Read Only. |c5d

It is good practice to make a KDF copy under Journal now, bumping the oldest Journal file there if necessary..it is backed up in the Journal tape already, anyway. |c5e

Note that distribution of hard copies, copying to magnetic tape, deletion of the :JRNL| type file, and notification of entry to the owner are yet to be accomplished. |c5e|

At this point, however, we do have a new Journal file with the proper directives for hardcopy printout and archiving on the Journal tape. |c5e2

Next you may process another Journal entry to the same stage, and others until the batch is done. Then, the hardcopies are made, to be sure we get the file out of the system before copying to tape. |c5f

The tape copy may now made for each file just processed, ending with dismount and remount tape to save directories?? |c5g

Note: The tape copy is the one "secure" copy of this new file. This step is critical and multiple copy backup is necessary at various stages until it is done. |c5g|

Now do a :RUNSTASH |c5h

This is done by advising an unused teletype, entering as HOPPER, setting Executivity to -|, and typing :RUNSTASH. It will save the current user directory. |c5h|

Next enter as each user affected and delete his old :JRNL files you just worked on, being careful not to delete any he might have added since you started. |c5h2

Next, send each sender a message, using the mail system, telling him that you have entered file :JRNL? in to the journal as: 48|?, etc. |c5h3

|c5h4

(mailentry) Special procedures: Mail entry into the Journal (WSD currently doing this part daily) |d

Enter as Journal, setting Executivity to -|. |d|

Copy Journal sequential file :JCF to another file temporarily for backup. |d2

Enter MAIL subsystem, using initials "JNL". |d3

These initials give you access to special Journal processing commands in the MAIL subsystem. |d3a

MAIL asks: Copy to= , you add another temporary filename (eg. ':JUNK') and when asked, add a new Journal file number for subsequent messages, after referring to the log of numbers. |d4

MAIL feeds back the number for a check, so type a period, if correct. If not, try again. |d5

Next go into TODAS, calling yourself a display .. regardless of the device you are using .., then execute viewchange to turn shiftcase off ... if you really are at a display ? (e v s f CA CA CA) ...? |d6

Insert QED branch after 0. Convert Case No Text from file :JUNK |d7

Then you will get output file :MAIL ..? |d8

Then you proceed to merge file :MJ branch :mj and follow the above procedures (jnlentry) |d9

(hcopy) Hard copy distribution 2

Control Master 2a

Access Copy 2b

Catalogue copy 2c

WSD copy 2d

Other distribution 2e

:4820, 08/18/70 |72|:42 MGC ; (NOR):JRNL|, 08/18/70 |6|9:18 MGC ;
.MCH=65; .SNF=72; .HED="4820 MGC |8AUG70
Notes from WSD/JCN meeting 8/17/70 re: Journal Entry
procedures"; .SNF=72;.MCH=65;.PGN=0;.DSN=1;.DPR=0;

WSD $482|.| WKE 08/|9/70 224|:49 HAVE YOU CONSIDERED ACCOMODATING THE EXECUPORTS NEEDS FOR EXTRA CARRAGE RETURN TIME WHEN TYPING MAIL?$ 1

WSD $482|.2 WKE 08/|9/70 2243:|9 WHY DID I JUST GET A 482|.| NUMBER ON THAT LAST MSG. IT SHOULD BE ABOUT 48|9.|5.?? $ 2

WSD $482|.3 BLP 08/20/70 005|:34 HOW DO YOU FEEL ABOUT MAKING THE DEFAULT SETTINGS FOR THE DIRECTIVES SNF (STATEMENT NUMBER FORMAT) = 7| (MY TERMINET PRINTS COLUMN 72 OFF THE END OF THE PAPER) AND MCH (NUMBER OF COLUMNS FOR THE TEXT OF STATEMENTS) = SAY 64 $ 3

DCE $482|.4 MGC 08/20/70 094|:24 FILES TD AHIRC SUBSC APR|N SRIFF SRITO CNFPR AND HMSRI HAVE BEEN ARCHIVED ON REEL 33 AND ENTERED IN FILE (ENG)ARKIV$ 4

WSD $482|.5 DGC 08/20/70 ||02:04 HOWDY THIS ISMY FIRST USE OF MAIL -- ITS AN EXCITING GADGET.YOUR (48|9.3) IS INSCRUTABLE. ALSO HOWCOME MESSAGES GET TRUNCATED?$ 5

WSD $482|.6 DGC 08/20/70 ||05:23 OKAY, I JUST FIGURED OUT HOW THE WRITE MESSAGE THINGY WORKS. YOURMESSAGE WAS INSCRUTABLE BECAUSE IT WAS TRNCATED. HOWS SONOMA?$ 6

WLB $482|.7 DGC 08/20/70 ||||:42 PROPOSED CHANGE IN DEFINITION OF "INVISIBLE" WOULD BE BADFOR TEXT-EDITING AND INTUITIVELY UGLY -- I VOTE AGAINST.$ 7

ARG BER BLP CHI DOC DIA DCE DGC EKV HAL JMY JBN JCN JDH JMH JNL JTM JRX KEV LSL MGC MEH MEJ MET MSC NDM VRB VDB WHP WKE WLB
WSD $482|.8 DGC 08/20/70 |||7:40 RE THE GREAT BOLONEY-SANDWICH CONTROVERSY, I SAY LEAVE THE "TRASH"IN FOR HISTORICAL REASONS. READING THROUGH THE MAIL FILES IN THEJOURNAL IS ONE OF THE MOST INTERESTING & INFORMATIVE THINGS I'VEDONE AROUND HERE FOR A WHILE.$ 8

WSD DCE $482|.9 WLB 08/20/70 ||22:57 DOUG SENT ME A VERY LONG MESSAGE IN THE MAIL (ABOUT HALF A PAGE OF TEXT). SOMETIMES WHEN I PRINT IT IT BOMBS THE MTTY SIMULATION BUFFER COMPLETELY (I JUST NOW DISCOVERED THAT BACK- SPACING OVER A RETURN WHILE SENDINA M TTY MSG DOESN'T HELP THINGS). BILL, I NOW FIND THAT I CANT DELETE THIS MSG 48|9.20; PLEASE SEE IF YOU CAN FIND WHAT'S WRONG. DOUG, UNTIL THINGS HAVE BEEN CHANGED, WE'D BETTER AVOID SENDING SUCH LON LONG MESSAGES THROUGH THE MAL.$ 9

ARG BER BLP CHI DOC DIA DCE DGC EKV HAL JMY JBN JCN JDH JMH JNL JTM JRX KEV LSL MGC MEH MEJ MET MSC NDM VRB VDB WHP WKE WLB WSD $4821.10 DGC 08/20/70 1135:10 I HAVE JUST DISCOVEED THAT YOU MUST USE CR'S, NOT LF'S, IN TYPING MESSAGES FROM A TERMINAL. THERE ARE NOW SEVERAL SCRAMBLED MESSAGES FROM ME IN THE MAIL -- YOU CAN READ THEM AT A DISPLAY BUT NOT FROM A TTY.$ 10

WSD $4821.11 MGC 08/20/70 1142:50 PLEASE SEND LIST OF CONTROL CHARACTERS FOR TODAS$ 11

WSD $4821.12 MGC 08/20/70 1147:55 WHY DO I GET I>>50000476 CONSISTENTLY WHEN TRY TO RUN :GETTER?$ 12

DGC JCN $4821.13 DGC 08/20/70 1245:45 TEST MESSAGE ONLY$ 13

WSD $4821.14 HAL 08/20/70 1309:32 ARRRGGGGHHH! FILE DIRECTORY HANDLING-- SEARCHING, MANIPULATION, GARBAGE COLLECTION, ETC.-- HARVEY$ 14

WSD WLB CHI $4821.15 DGC 08/20/70 1347:34 FILE (CASSERES):MUG IS A FIRST-DRAFT USERGUIDE FOR THE MAIL SUBSYSTEM. COMMENTS PLEASE ASAP, ALSO TELL ME WHO ELSE SHOULD SEE THIS BEFORE IT IS RELEASED. THANX DGC.$ 15

WSD $4821.16 MGC 08/20/70 1357:52 4819 JOURNALISED. :GETTER OK.$ 16

JCN $4821.17 MGC 08/20/70 1444:11 (ENGE)JRNL1 AND JRNL2 NOW 4822 AND 4823$ 17

WKE $4821.18 WSD 08/20/70 1530:10 I'M THINKIN ABOUT EXECUPORT. JOURNAL NUMBER WILL CHANGE FROM DAY TO DAY$ 18

BLP $4821.19 WSD 08/20/70 1532:05 YES..AND I HAVE ANOTHER THOUGHT ABOUT IT...I THINK THAT THE TERMINET HAS AN HONEST TO GOD TAB ON IT. COULD WE USE THAT FOR SPACING TO NUMBER COLUMN??$ 19

HAL $4821.20 WSD 08/20/70 1538:43 MONDAY..I FOUND A HARD COPY VERSION OF THE FILE HAVE HOPE OR...LASCIATI OGNI SPERANZA, CHI CHE VOI QUI ENTRATA!$ 20

MGC $4821.21 WSD 08/20/70 1539:27 GETTER NEED EXECUTIVITY$ 21

MGC $4821.22 WSD 08/20/70 1542:15 CONTROL CHARACTERS COMING$ 22

ARG BER BLP CHI DOC DIA DCE DGC EKV HAL JMY JBN JCN JDH JMH JNL JTM JRX KEV LSL MGC MEH MEJ MET MSC NDM VRB VDB WHP WKE WLB WSD $4821.23 WSD 08/20/70 1543:46 NEW MAIL FEATURES...LIST ONLY TYPES

HEADERS OF MESSAGES, AND IT IS CALLED WHEN NLS IS ENTERED. THERE IS A COUNTER FOR EACH USER, TELLING HOW MANY MESSAGES FOR HIM. THIS SPEEDS UP MAIL SEARCH WHEN NO MESSAGES ARE PRESENT$ 23

WSD $482|.24 MGC 08/20/70 |556:05 COUNTER IS GREAT IMPROVEMENT$ 24

WLB $482|.25 MGC 08/20/70 |648:43 (BASS) NFPRE NFLIS NFABS NFBIB AND (MSR) NF3NI NFNIC NFAPA NFTA ARCHIVED ON REEL 33$ 25

WSD $482|.26 WLB 08/20/70 |654:50 3 GUYS FROM SDC (ARIE SHOSHANA, BOB LONG, AND ABE LANDSBERG) WISH TO VISIT US FRIDAY 28 AUGUST TO DISCUSS THE NETWORK, DISTRIBUTED DATA BASES, AND DATA BASE MAN. SYSTEMS. DOUG THINKS THAT YOU SHOULD BE HERE TO JOIN IN THE TALKS. CAN YOU PLAN TO COME ON THAT DAY?$ 26

WSD $482|.27 BLP 08/20/70 |705:|8 BUT PASS4 DOESN'T KNOW WHAT DEVICE IT'S SENDING TO AND THE TELETYPE AND DISPLAY DON'T HAVE TABS $ 27

WSD $482|.28 WLB 08/20/70 |743:|3 MY MAIL IS SO THROUGHLY FUCKED UP THAT I CANT WORK WITH IT. IF I TRY, IT WIPES OUT THE TTY SIMULATION BUFFER, LEAVING ME WITH |O MINUTES OF WORK TO JUST GET LOGGED OUT. COULD YOU PLEASE USE BRUTE FORCE TO GET RIDE OF 48|9,20 (I THINK; IT'S THE ONE FROM DCE) WHICH IS CAUSING MOST OF THE TROUBLE, AND I CAN'T DELETE IT. ALSO, WHEN I TRIED WRITING YOUR MSG OUT IT CAUSED AN I-TRAP (I'LL CHECK TO SEE IF YOU HAVE TO USE A NEW FILE NAME FILE NAME. ALSO, PENDING MORE SUBSTANTIAL CHANGES, I THINK IT WOULD BE DESIRABLE TO ELIMINATE TH 2000 CHARACTER LIMIT ON PRINTOUT FROM THE MAIL AND, INSTEAD, MAKE RUBOUT WORK CORRECTLY DURING PRINTING. THANKS. WALT.$ 28

WSD $482|.29 WLB 08/20/70 |75|:48 THE I-TRAP WASN'T FROM USING AN OLD FILE, AND IT HAPPENED WITH BOTH OF THE MSGS I TRIED TO WRITE (NOT INCLUDING 48|9,20. RE THE NEW NLS ENTRY SEQUENCE: -IN NLS ALL WAIT TIME IS FROM FILE I/O, NOT TYPING, SO JUST LISTING MESSAGES ACTUALLY COSTS TIME RATHER THAN SAVING IT. I WOULD SUGGEST THAT YOU JUST PRINT THE NUMBER OF MSGS WAITING (SINC THIS CAN BE DONE WITH NO DELAY) AND LET THE USER DECIDE WHETHER HE THEN WANTS A LIST, THE MAIL, OR JUST TO GET INTO NLS.$ 29

WSD $482|.30 WLB 08/20/70 |759:24 THE I-TRAP WASN'T FROM USING AN OLD FILE, AND IT HAPPENED WITH BOTH OF THE MSGS I TRIED TO WRITE (NEITHER O THESE WAS 48|9,20). 30

DGC $482|.3| MGC 08/2|/70 ||27:27 WHEN I TURN SHIFT CASE OFF IN TODAS, I CAN'T GET VIEWSPECS TO WORK IN THE PRINT STATEMENT COMMAND -- WHAT AM I DOING WRONG?$ 3|

MGC $482|.32 DGC 08/2|/70 ||48:37 REGARDING (482|.3|) YOUR ARE PRESUMABLY STUCK IN UPPER CASE -- SO YOUR VIEWSPECS ARE UPPER CASE AND DONT MEAN WHAT YOU WANT THEM TO. TURNING SHIFT CASE ON AND OFF IN TODAS IS ONE OF THE MANY TODAS FEATURES THAT HAS COMPLEX SIDE EFFECTS.$ 32

WHP CHI WLB MSC $482|.33 DGC 08/2|/70 ||59:28 HOW ABOUT CHANGING NAMES OF NLS COMMANDS SO THAT WE HAVE EXECUTE ANLYZER COMPILER (EA) TO DO AN OORDINARY PATTERN COMPILATION, AND EXECUTE CONSTRUCTION COMPILER (EC) FOR CONSTRUCTION-LANGUAGE PROGRAM COMPILATION?$ 33

CHI $482|.34 DGC 08/2|/70 |20|:48 IS THERE ANYTHING COMPREHENSIVE WRITTEN UP ON HOW TO USE STRING-CONSTRUCTION LANGUAGE?$ 34

ARG BER BLP CHI DOC DIA DCE DGC EKV HAL JMY JBN JCN JDH JMH JNL JTM JRX KEV LSL MGC MEH MEJ MET MSC NDM VRB VDB WHP WKE WLB WSD -(DGC JCN $482|.35 DGC 08/2|/70 |546:02 TEST MESSAGE DISREGARD$ 35

WSD $482|.36 DGC 08/2|/70 |550:43 DOES MAIL ALLOW YOU TO PUT AN EXCLUSION LIST AFTER "ALL" IN THE DESTINATION FIELD? IF SO, WHAT IS EXACT PROPER FORMAT? I TRIED THE FORMAT "ALL -(DGC JCN)" BUT MESSAGE WAS SENT TO ME AND JCN.&$ 36

JDH $482|.37 MGC 08/2|/70 |6|0:46 WHEN I TRY TO MOUNT REEL 33 I GET "CAN'T GET F.D."$ 37

DGC JCN $482|.38 WSD 08/2|/70 |744:08 NO, EXCLUSION LIST COESN'T WORK$ 38

MSC WSD BLP $482|.39 CHI 08/2|/70 |8|6:35 KDF FILES REORGANIZED. HASH FILES UNDER MOL
HASH|O FOR PDP|O FLES $
39

WSD $482|.40 JCN 08/22/70 |723:57 WHEN ARE YOU GOING TO SET OUT THE NEXT MAIL FILE FOR THE JOURNAL....BEFORE YOU COME DOWN MONDAY??$

40

```
':482|', 08/23/70 2330:41 JCN ;  ':MAIL', 08/23/70 1546:17 WSD ;
.HED="482| wsd 23aug70
Mail File";  .SNF=72;.MCH=65;.PGN=0;.DSN=|;.DPR=0;
```

SUMMARY

This is essentially a proposal for making slight (I hope) alterations to IMP software, and no (I hope) alterations to its hardware, to provide for each host site having one special typewriter station devoted to Network-people communications -- a host-supplied typewriter that is tied directly to the loal IMP, and that is up and useable for communicating with other sites no matter what the state of all of the Network's host facilities. I recommend putting this typewriter at a location where it can be under the custodianship of a "site agent" -- a reliable secretary or the like, to maximize the service given that station to incoming queries or messages. This sub-NETWORK-system I call NETWX, and would be run entirely within the IMP system, but it would serve a very useful purose in any message-management system run by one or more hosts. It would be a huge boon to NIC operation.

Specific features to be programmed into the IMPs (for one special typewriter station per site):

An operator command for "Connect me to Station X," and the protocol for then linking to Station X.

Protocol for (when X is unavailable) giving suitable "busy" message to the calling operator.

Protocol and Commands for letting the calling operator specify an "interrupt request" for the called station.

Protocol and signalling means to then signal the called operator that a caller wishes to interrupt.

Protocol and command so that called operator can do a Hold-Disconnect from current circuit.

Protocol, operator feedback, and operator commands to facilitate sequence of Connect and Disconnect operations to manage a number of waiting and held parties while intiating new calls or serving an established call.

Protocol for permanently disconnecting (Break Disconnect) a circuit.

THE NETWX SYSTEM (A Proposal) 2

FOR EACH HOST SITE, ARPA/BBN PROVIDES A SPECIAL PORT ON THE LOCAL IMP TO WHICH THE HOST GROUP MAY ATTACH A TYPEWRITER FOR THEIR UNLIMITED NETWORK-COMMUNICATION USE: 2a

It would be reasonable to require this typewriter to be Teletype compatible -- e.g., I picture a TTY37 as being quite suitable. 2a1

Call this the Communication Typewriter (CTY) for that Network site -- which is different from the System Typewriter (STY) that ARPA/BBN may choose to keep attached to the IMP for debugging, etc. (and whose access and use would rightfully be limited). 2a2

A special sub-system is embedded in the IMP programs to service these CTYs. (Becaue of similarities to the TWX system, I'm using the name "NETWX" for this subsystem.) In making this proposal, I am assuming that the NETWX sytem would require no alteration in IMP hardware, and relatively little in the software. 2a3

IMPs provide the CTYs with a basic communiction-coupling service directy analagous to that which a telephone switching system provides its subscriber telephone sets: At a caller's request, establish a circuit between this set and a specified target instrument so that two-way communication can be carried on, etc. 2a4

This service is controlled by means of a simple and limited command reportoire composed of "escape codes" that are intercepted by the IMP and not treated as message components to whomever the CTY is otherwise connected. "Dialing" is done by typing appropriate character codes -- e.g., abbreviated numeric codes looked up in an "NETWXbook," or if a bit more elegant, mnemonic-name codes. 2a4a

What is visualized is a terminal/person station always available at each site whose prinicipal function is to serve personal communications in the Network; it can be "raised" from any operative terminal in the network; its current business can always be interrupted by a local need for basic communications; and it provides that for each site, no matter how bad off the current local-host hardware, software, or user-load situation might be, that group isn't out of communication with the rest of the

network. 2a5

This personal-communication capability should be the last to be lost in a degenerative-Network malady, and the first to be restored thereafter. When any two IMPs and a workable phone channel between them are up (minimum Network function), the Communication Typewriter is "up" for first-level, basic use. When almost nobody is raisable, assumedly BBN (or whoever is maintaining and operating the IMP/Phone-Channel Network) can be raised to learn what's wrong with other CTY stations -- if not, then revert to telephoning. 2a5a

A MOST-BASIC SYSTEM COULD WORK AS FOLLOWS: 2b

1. A CTY operator could request connection to the CTY at another specified host site, or to the monitor of a specified host computer. 2b1

2. A "busy" response would be provided if the called CTY were currently linked to either a host or another CTY. 2b2

3. "Not-up" or "no-room" responses would be provided if the connection couldn't be made to the requested host computer. 2b3

4. After finishing his communication over this circuit, the calling operator keys in a "break-link" escape code, following which his CTY can immediately be used to initiate or receive another call. Following such a Break-Link opertion, his IMP would tell the remote IMP that the linkage is all over. If the connection had been with another CTY, then that too become free to receive or initiate calls. If to a host, the monitor is told that this CTY is logging off, (or something suitable). 2b4

NOTE: Enabling a CTY to communicate with host computers (when they are up) has value for such as communicating with people at terminals other than a CTY, depositing or accessing messages in a message-queing system; And of particular interest to me is the CTY use for depositing, accessing or updating bulletins, current-reference material, queries, suggestions, etc. in the NIC system. 2b5

TO PROVIDE A CONSIDERABLE ADDED VALUE, I PROPOSE THAT BEYOND THE BASIC NETWX FEATURES LISTED ABOVE, THE FOLLOWING SUGGESTIONS ARE SERIOUSLY CONSIDERED: 2c

Note that one highly important feature of the NETWX system would be its ability to meet the needs for quick queries or message, where guaranteed throughput and other-end attention are very important. 2c|

For instance, "Tell Pete that SNERX is now up, but don't try GROKING until he hears further from me," or "Tell George not to log out until I patch FIZZLE or he'll lose his file," or "Are you going to bring SUPERFRIGHT up today or should I quit waiting?" or"Did you change the FLOP feature in PARSGARB or does it have a new bug -- I can't seem to do a FLIP?". 2c|a

In the first place, the location and custodianship of the CTY would be important. 2c2

I'd strongly propose that it be located next to Betty, the secretary (or girl Friday, or computer operator, or...) that one finds in every lab and whom all the guys tend to look up to as such as, "Where's Pete today," "Did anyone mention taking down the system today," "Has BBN contacted us about checking the IMP?" and etc. 2c2a

Betty should be given plentiful encouragement and help toward learning how to use the NETWX system, and to consider herself responsible as the local Network Communication Agent. 2c2b

It would also be expected that Betty would help other people learn to use NETWX, to keep organized the hard-copy reference items provided (like by NIC) to help people use the system. (And if Betty could serve as the local NIC agent, my hopes would soar.) 2c2c

Then NETWX needs to provide means for interrupting one communication process by another. The following seems adequately straightforward and effective: 2c3

Operator protocol features need provide for such as busy signals, disconnects from current call but hold, connect to new call, be aware of who may be waiting, etc. Along with a given protocol, it is helpful for the operator to have an image of what is transpiring that helps remember procedures and states. 2c3a

Let the operator have the image of having 9 local, incoming lines (Lines | through 9), and that her (his) IMP will always use the lowest-numbered free

line to establish a circuit (a connection with another party) for a new out-going or in-coming call. 2c3a|

When a caller receives a "Busy" signal for the called CTY, she (he) has the option of requesting an interrupt so that she can negotiate the conflict in NETWX usage with the called operator. 2c3b

The IMP at the interrupt-called site has a way of signalling to its CTY operator -- for instance with the BELL on a Teletype --so that without interfering with the communications over her current circuit it can inform her that another caller is asking for a chance to break in. 2c3c

The interrupt-called operator can choose to ignore this interrupt-request signal. 2c3c|

To serve an interrupt request, the interrupt-called operator follows this procedure: 2c3d

Readies the current other-end party for her leaving the line -- arranging to hold things as they were until she returns. 2c3d|

It should be a system rule that the CTY is never used in a way that prevents such a Pause-Disconnect. For instance, it shouldn't be used to run a compile-debug operation which will have to be redone if disconnected from, unless one is freely willing to abandon it in this manner if he receives a caller-interrupt request. 2c3d|a

Note: all NIC subsystems would be adapted to this interruption procedure -- including the typing out of long documents. We'd let an operator break off at any point, and upon Continueing would re-paginate and begin over on the interrupted page; also we'd provide an operator option of requesting a Pause at the next pagination break if she felt she had the time and wanted to avoid the retyping time. 2c3d|b

Gives the Hold-Disconnect escape command (Break but hold the circuit), whereupon the IMPs refuse incoming transmissions on the Held Circuit until the operator subsequently re-connects to it. 2c3d2

(Various conventions can be considered for dealing with disconnection as differentiating between the calling and the called parties. One possibility is that either party can execute a Break-Disconnect, while another is that only the calling party can -- i.e. for a called party, the Break-Disconect command does the same thing as the Hold-Disconnect does.) 2c3d2a

After a Disconnect from one circuit to take care of one or more interrupt calls, all the waiting lines have the same status -- they are like being Held reaqy for connection, whether from previous Held Disconnects or from new Interrupt calls. The IMP-CTY are now in direct-talk mode, no invisible escape-code command conventions are needed. 2c3d3

The first thing the IMP does is to type out the numbers corressponding to the lines that are waiting (If we want more elegance, give some associated identification of the caller -- like UCLA CTY, or NIC BULLETIN, or etc.). 2c3d3a

It is assumed that the operator will want to connect to one of these waiting lines, but if she wishes she can select a free line and make a new call. 2c3d3a|

Connection selection is done with a command symbol and the appropriate line-designation digit. Subesequenty, the operator can disconnect from that party by either the Hold or Break Disconnect operation -- i.e. she can have a number of Held Circuits at any given time. 2c3d3b

Realize that the new-connect line may be a circuit with either a (new or old) caller party or an old called party. 2c3d3b|

ADDED NOTES 3

IMPLEMENTATION POSSIBILITIES: 3a

1. Distributed-IMP system 3a|

This seems the most natural way to "want to" try implementing the system. 3a|a

Each IMP has the same programming as every other IMP. This would be the most reliable system, but also would require most of what is probably a scarce resource -- IMP core capacity. 3a|b

2. IMP-Supported Central Switching-Control System 3a2

Give one "central" IMP enough extra memory, and program in it a special package to attend to the CTY services as follows: 3a2a

For each CTY, its IMP would reserve enough core space to handle two (small) control-data arrays and a small program (the latter could be common to the several CTY's in case thi IMP serves more than one host site). 3a2b

A communication-control array would control the current CTY circuit connection, specifying such as the IMP links involved, etc. 3a2b|

A state-transition table would contain a list of the control characters to watch for from the local CTY that, in the current state, are valid for operator specificaton of a state change. 3a2b2

A program to do character echoing, transmission throughput, state-transition-character checking, and calling on Central if a transition character is found, 3a2b3

The Central program would keep track of the state of each CTY. When notified of a particular state-transition character transmitted by a given CTY, it determines the resulting new state, and sends off the following sequence to the IMP(s) involved: 3a2c

A change of communication pathways as appropriate, to be stuffed into the communication-control array(s). 3a2c|

A change in the transition-character table(s) 3a2c2

Feedback characters to the operator(s) involved, as appropriate for the particular state change (and perhaps the history and current communication context). 3a2c3

3. IMP-Supported Central Switching System 3a3

Again, one IMP is supplied with extra core and a special program. 3a3a

But here, all of the IMPs handle their CTYs in one fixed and simple fashion: They serve merely to relay all characters back and forth between the CTY and NETWX Central. 3a3b

And Central takes care of all the details of transmission, control interpretation, state changing, and operator feedback. 3a3c

This requires a minimum core space in all of the "outlying" IMPs for providing the NETWX service. And the extra loading on Network transmission that this Central Switching incurs wouldn't strike one as serious, since all NETWX traffic (currently) is to be at typewriter rates, 3a3d

4. Host-Supported Central System 3a4

Any host computer could service either of the above types of NETWX-Central schemes. 3a4a

Assumedly this wouldn't be as reliable, but it only requires the one host to be functioning (hardware interface, software interface, time-sharing monitor, and NETWX package in its monitor) in order to sustain the NETWX system for all sites. 3a4b

It is conceivable that a NETWX-Central package could be developed for each of several host computers. Suppose that their monitors periodicaly checked on each other's "up" state, and had among them a consistent algorithm for deciding which one would take over under what "up" state. A host monitor that decides it should take over as NETWX Central need merely transmit to all the IMPs the necessary word packets that switch their CTY circuits to it. 3a4b1

CHARACTER ECHOING 3b

Much seems to have been said about the value of poviding a typewriter with full-duplex transmission to the target sub-system. For NETWX puporses, I wouldn't attach all that much value to this feature, assuming that the typewriter connection is full duplex to the local IMP. If it otherwise seemed to expensive, I think that having immediate echoing from the local IMP would be quite workble -- this allows that IMP to interject signalling and feedback characters into the message stream if necessary. 3b|

I wouldn't expect this transmission mode to diminish particlarly the service we could give to CTY stations from our NIC subsystems. 3b2

GENERAL MESSAGE MANAGEMENT 3c

The NETWX system could form the base of a more general message-managemnt system operating within one or more host computers. NETWX would serve here as the message-delivery sub-system, while still being available for direct personal, point-to-point communicaton use. 3c|

At a first level of service, a message-management system would provide for queing messages so that the receiving station wouldn't have to be free for reception when the sender was. 3c|a

Also, provision for "broadcasting" a message to a specified group of recipients would be useful. 3c|b

Further, the availability of some sort of verification feedback would be reassuring to the sender. 3c|c

Beyond this could be such as a facility for sending "registered" messages: each such messages is stored, and is retrivable by its registry number; indexing and search provisions are available for finding past messages according to sender, target, date, topic, etc.. 3c|d

Nic would like to participate actively in the developmet of such a system. We are developing such a system within our own Center, as part of what we call our Dialoge Support System, and I assume that our developing dialogue-support techniques would enable NIC to make a very useful contribution when they are integrated into a Network-wide

message-management system. 3c2

GENERAL COMMENTS 4

The strong appeal I find in this NETWX-system possibility stems from the following considerations: 4a

Until most of the hosts are up most of the time, with capacity to log-in an adequate number of remote users through the NET, there will be basic difficulty in doing the kind of intercommunicating around the Network that facilitates the molding of the participants into a community. This in turn inhibits development of the very techniques that will augment community dialogue. 4b

In particular, I have been peculiarly inhibited in opening the doors on NIC service by the bind that: 4c

We have designed a NIC service for an on-line community -- but it isn't on line yet, and it barely is a community. 4c|

I know that a good NIC service, by the basic process of facilitating communiation, could help considerably in forming up the community and getting it on line. 4c2

NIC really needs a strong, dependable communication link TO THE PEOPLE at the host sites. A great deal in this direction can be achieved by what seems like a very modest communication system (i.e. NETWX). 4c3

In the current Network design, communication from a participant at point A to one at point B depends upon proper functioning of each element in a rather long chain -- logically falling into three main "links": 4d

Host-A Facility 4d|

Time-sharing-system up and working well 4d|a

Time-sharing-system has room for the A to log in 4d|b

Network-package in the Monitor working right 4d|c

Host-Imp hardware interface working right 4d|d

Network 4d2

IMPs, Phone Channels, etc. 4d2a

Host-B Facility 4d3

Host-Imp hardware interface working right 4d3a

Network-package in the Monitor working right 4d3b

Time-sharing-system up and working well 4d3c

Time-sharing-system has room for A to log in 4d3d

Then one of these conditions must exist: Participant B is logged in and active, so A can link to him; someone else who is logged in can be linked to for asking that word be relayed to B; there is an on-duty operator for doing this; or there is a message-delivery system programmed into Host B. 4d3e

Over this chain of elements, consider factors such as how solid and conservative are the designs, and what is the orientation toward and the attention given to maintenance, reliability and servicability, 4e

Then review these factors with respect to what appears through the Network hosts in the way of a mix of home-made vs. bought, experimental vs. production, hay-wired vs. careful design, bug infested vs. intensive and constant bug hunting, etc. 4e1

In reviewing these factors for a given site, give special cnsideration to the following: the IMP-interface hardware and software; the time-sharing monitors; the availbility and usage practices of the different terminals; facility operating practices, such as when is what operating system up and who knows about it, and when is an operator or knowledgeable anybody alert to remote-user difficulties; and what generally are the local attitudes and resource allocations toward the mere matter of providing for the communication of information to people (which would generally compete for development and operational resouces with the substantive host-site research activities). 4e2

The two host facilities are now, and will be for some time, much the weakest links in this A-to-B communication chain. 4f

Which leads me to conclude that the simple business of communication between people around the Network is going to be much more frustrated than facilitated -- for what I would guess to be six to eight more months. And after that, even if attitudes and resource allocations toward

communication facilities improve, the low-bandwidth I-need-it-now communication will be blocked fairly frequently by saturation of the log-on limits of one of the hosts due to increasing occurrence of longer-period activity by the programming and subsystem users. 4f|

It seems quite reasonable to me to make special provisions, at least during this next year, for a simple typewriter communication network that is embedded as a rudimentary sub-net within the Network, and whose operational reliability was very solid, 4g

With regard to the NIC, if the Network technology could provide a reliable and constant communication linkage to such as an on-duty "agent" (e.g. a centrally located secretary) at each site, the whole aspect of getting NIC to be real to people, and providing them with service as the Network goes through its transitional stages, would change like magic. 4h

I urge serious consideration for early implementation of such as the NETWX system which I propose above. 4i

:4822, 08/20/70 |522:38 MGC ; ':JRNL|', 08/20/70 |228:55 JCN ;
.DPR=|; .HED="4822 MGC 20AUG70
NETWX THINKPIECE, D.C. Engelbart 3 Aug 70 NIC
4790";(transmitted by DCE to B.Wessler, ARPA, Wash D.C. via TTY 8/3/70)
text in parenthesis deleted from HED ["CEN=|"]; .SNF=72; .MCH=65;
.DSN=|; .DLS=|; .PLO=|; .RTJ=0; .PGN=0; .DPR=0; ["555"];

and (479|,), Memo to Princ-Inv's re. Host-NIC Interface
Arrangements
see (4792,), NIC Newsletter

4823 MGC 20AUG70
Rough Cost Prediction Transmitted by DCE to ARPA 7/29/70

Rough cost predictions for project 8457 |
Personnel cost is based on past levels |a
Material estimates are shown as subs under each month |b
All figures include 4.5% fee |c
2
["Cybernex"]OR["DEC"]OR["BB&N"]OR["PDP-10"]; |8|,500 3
["940"]; |23,200 4
Total funded to date $645,000 5
Total expended through 7/18/70 450,000 6
Cost sheets show $426,368 -- extra allowed for unpaid invoices 6a
7
Predictions by months: 8
9

	Personnel		Other	Total	Balance	
July	28,000		39,400	67,400	|27,600	10
	940	|7,600				11
	Drums	6,000					11a
	Disc	5,300					11b
	Cybernex	|,600				11c
	Bay	2,200					11d
	Other	6,700					11e
	Terminals		|,345			11f
	Printer		|,055			11f1
	Disc maint		800				11f2
	Consultants		2,000				11f3
	Maint and ops		|,500			11f4
Aug	56,000		43,000	99,000	28,600		11f5
	940	|7,600				12
	Drums	6,000					12a
	Disc	|0,500				12b
	Bay	2,200					12c
	Other	6,700					12d
Sep	56,000		45,300	|01,300	-72,700	12e
	940	|7,600				13
	Drums	6,000					13a
	Cybernex	|5,000				13b
	Other	6,700					13c
Oct	56,000		57,300	|13,300	-186,000	13d
	940	|7,600				14
	Drums	6,000					14a
	Cybernex	25,000					14b
	TV cameras	2,000					14c
	Other	6,700					14d
Nov	56,000		|24,600	|80,600	-366,600	14e
	940	|7,600				15
	Drums	6,000					15a
	Cybernex	20,000					15b
							15c

4823 MGC 20AUG70
Rough Cost Prediction Transmitted by DCE to ARPA 7/29/70

BB&N	52,000				15d
Paging box		52,000			15d1
DEC	17,300				15e
Lease		13,450			15e1
Maintenance		1,850			15e2
Shipping		2,000			15e3
Miscl PDP-10	5,000				15f
Other	6,700				15g
Dec 56,000		60,600	116,600	-483,200	16
940	17,600				16a
Drums	6,000				16b
Cybernex	10,000				16c
BB&N	5,000				16d
Consulting		5,000			16d1
DEC	15,300				16e
Lease		13,450			16e1
Maintenance		1,850			16e2
Other	6,700				16f
Jan 56,000		70,600	126,600	-609,800	17
940	17,600				17a
Drums	6,000				17b
DEC	15,300				17c
HC output	25,000				17d
Other	6,700				17e
Feb 56,000		28,000	84,000	-693,800	18
Drums	6,000				18a
DEC	15,300				18b
Other	6,700				18c
March 56,000		28,000	84,000	-777,800	19
Drums	6,000				19a
DEC	15,300				19b
Other	6,700				19c
April 56,000		28,000	84,000	-861,800	20
May 56,000		28,000	84,000	-945,800	21
June 56,000		28,000	84,000	-1,029,800	22
July 56,000		28,000	84,000	-1,113,800	23
Aug 56,000		28,000	84,000	-1,197,800	24
Sep 56,000		28,000	84,000	-1,281,800	25
Oct 56,000		28,000	84,000	-1,365,800	26
Nov 56,000		28,000	84,000	-1,449,800	27
Dec 56,000		28,000	84,000	-1,533,800	28
Jan 56,000		28,000	84,000	-1,617,800	29

':4823', 08/20/70 1434:09 MGC ; ':JRNL2', 08/20/70 1245:15 JCN ;
.NSW=0; .SCR=1;.HED="4823 MGC 20AUG70
Rough Cost Prediction Transmitted by DCE to ARPA 7/29/70"; (copy of
Engelbart file :COST) .SNF=72;.MCH=65;.PGN=0;.DSN=1;.DPR=0;

WSD $4824.1 WSD 08/23/70 1643:14 THIS IS A TEST$ 1

JCN $4824.2 WSD 08/23/70 1645:26 JIM..I WAS HAVING TROUBLE FINDING A TIME WHEN THE SYSTEM WAS UP TO ENTER MAIL INTO JOURNAL. IT WAS DOWN FRI EVE, SAAT A.M., AND SUN A.M. WHEN I TRIED$ 2

ARG BER BLP CHI DOC DIA DCE DGC EKV HAL JMY JBN JCN JDH JMH JNL JTM JRX KEV LSL MGC MEH MEJ MET MSC NDM VRB VDB WHP WKE WLB WSD $4824.3 WSD 08/23/70 1646:57 THERE WAS A BUG IN MAIL WHICH MADE IT HARD TO DELETE A MESSAGE WHEN THERE WAS A CRASH DURING THE SENDING OF THAT MESSAGE. THIS HAS BEEN FIXED. TO DELETE SUCH MESSAGES, CONTACT ME$ 3

MGC $4824.4 JCN 08/23/70 2341:57 (JOURNAL):4821 IS READY FOR COPYING TO TAPE, AND NOTIFYING WSD OF COMPLETION OF THE ENTRY CYCLE. I BROUGHT IT TO ITS PRESENT STATE FOR PRACTICE$ 4

DGC $4824.5 WLB 08/24/70 0909:33 RE (4821,33) -- OK WITH ME.$ 5

WSD $4824.6 WLB 08/24/70 0910:39 RE(4824,3) -- THANKS, BILL. MAIL IS WORKING NOW.$ 6

WLB $4824.7 WLB 08/24/70 0912:00 MONDAY 24 AUG 1400 -- DAVID COLE VISITING.$ 7

WLB WSD BLP JTM DCE $4824.8 WLB 08/24/70 0918:09 FRIDAY 28 AUG 1970 VISIT BY ARIE SHOSHANI, BOB LONG, AND ABE LANDSBERG OF SDC. TENTATIVE SCHEDULE: 1100 ARRIVAL, SYSTEM DEMO (DGC OR JCN?) 1200 LUNCH (RSVP IF YOU ARE INTERESTED) 1330 MEETING WITH WLB, WSD, JTM, BLP (OPEN ENDED)$ 8

DGC $4824.9 CHI 08/24/70 1035:40 RE4821.34, SEE ROME REPORT--IT'S THE BEST WE HAVE$ 9

DGC $4824.10 CHI 08/24/70 1051:02 MIAL USER'S GUIDE LOOKS FINE. THANKS.$ 10

WSD $4824.11 MGC 08/24/70 1104:06 JRNLP4821 NOW 4821$ 11

WSD $4824.12 DGC 08/24/70 1104:40 HAVE YOU LOOKED AT MAIL USERGUIDE YET? DRAFTV IS (CASSERES) :MUG. WOULD LIKE YOUR OK BEFORE RELEASING, WOULD LIKE TO RELEASE AS SOON AS POSSIBLE. TNX DAVE.$ 12

JCN $4824.13 MGC 08/24/70 1124:06 DID YOU FIGURE OUT HOW TO GET OUT OF :MJ?$ 13

MGC $4824.14 JCN 08/24/70 1206:59 NO$ 14

WHP CHI $4824.15 WLB 08/24/70 1241:24 when you do a jl which fails because the statement name is not found,very unpleasant things happen, particularly if the link is to another file: you end up in the linked-to file, with the display showing the original file, and with the return stack not set (so you can't get back into the original file without reloading it.$ 15

WLB $4824.16 WLB 08/24/70 1421:45 THIS IS A TEST MESSAGE FOR DAVID COLE.$ 16

JCN $4824.17 MGC 08/24/70 1439:06 (NORTON):JRNL| NOW J4826$ 17

HAL $4824.18 MGC 08/24/70 1439:53 (LEHTMAN):JRNL| NOW (JOURNAL):4826 $ 18

ARG BER BLP CHI DOC DIA DCE DGC EKV HAL JMY JBN JCN JDH JMH JNL JTM JRX KEV LSL MGC MEH MEJ MET MSC NDM VRB VDB WHP WKE WLB WSD $4824.19 WSD 08/24/70 1725:55 NEW MAIL FEATURE: NUMBER OF MSGS:. NOW TYPES NUMBE OF MESSAGES WHICH YOU HAVE WAITING. THIS IS CALLED WHEN YOU ENTER NLS/TODAS INSTEAD OF LIST$ 19

WLB $4824.20 WSD 08/24/70 1729:36 I TINK I MUST RESPECTFULLY DECLINE LUNCH, IN THAT I SHOULD SPEND TIME DOWN HERE MEETING WITH S MANY PEOPLE AS POSSIBLE...THANX ANYWAY, AND I'LL MAKE MEETING AT 1330$ 20

DGC $4824.21 WSD 08/24/70 1730:01 NOTE NEW MAIL SYSTEM FEATURE.$ 21

WLB $4824.22 JCN 08/24/70 1832:12 HOW ABOUT A MEETING WITH ME AS EARLY TUESDAY AM AS YOU FIND CONVENIENT .. TO DISCUSS MY CONVERSATION NIC LETTER (S) AND DCE IDEAS?$ 22

ARG BER BLP CHI DOC DIA DCE DGC EKV HAL JMY JBN JCN JDH JMH JNL JTM JRX KEV LSL MGC MEH MEJ MET MSC NDM VRB VDB WHP WKE WLB WSD $4824.23 WKE 08/24/70 1910:36 PLEASE NOTE NEW NLS SCHEDULED TIME STARTING WEDNESDAY $ 23

WKE $4824.24 WKE 08/24/70 2241:05 LOOK FOR A PHONE CALL FROM ST.PAUL, UNIVAC. REFER IT TO DAVE HOPPER AT HOME$ 24

WSD $4824.25 CHI 08/25/70 0836:09 BILL, PLEASE DELETE THE FOLLOWING INITIALS FROM THE 'ALL' LIST (THEY NEVER HAVE A CHANCE TO RECIEVE OR DELETE THEIR MAIL) DOC, ARG, JMY, LSL, VRB, MET, MEH, EKV, AND JAKE (IF HE IS IN THE LIST). MUCHAS GRACIAS.$ 25

WLB $4824.26 CHI 08/25/70 0841:33 RE: 4824.15, THANKS FOR THE NOTE ON JUMP TO LINK. I ALREADY KNEW ABOUT THAT PROBLEM AND THE ONLY STRAIGHT- FORWARD WAY TO FIX IT WOULD BE TO HAVE THAT ABORT MESSAGE (OR ALL ABORTS) TO RECREATE THE DISPLAY--AN INCONVENIENCE THAT PEOPLE WOULD PROBABLY COMPLAIN ABOUT. ANY SUGGESTIONS?$ 26

WSD $4824.27 CHI 08/25/70 0851:45 BILL, SINCE THE COUNTER YOU KEEP (IN THE MAIL SYSTEM) IS FOR THE CURRENT (UNJOURNALIZED) MAIL, ONE GETS THE NO-MAIL MESSAGE WHEN HE MAY ACTUALLY HAVE MAIL AND POSSIBLY AN INCORRECT COUNT FOR NUMBER OF MESSAGES. I AM NOT SUGGESTING THAT YOU CHANGE THE COUNT ONLY THAT THE MESSAGES BE CHANGED TO INDICATE THAT THERE WIS NO CURRENT MAIL, AND THAT ONE HAS NNN CURRENT MESSAGES. CLEAR AS MUD, HUG? THANKS.$ 27

$4824.28 CHI 08/25/70 0925:47 CHI $ 28

CHI $4824.29 CHI 08/25/70 0927:34 DUMMY MESSAGE$

29

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