DCE 28-DEC-71 7:56 8309

Phone Log: Dr. Thomas Keenan of NSF, searching for researchers whose funds had been cut by other agencies

He was calling to see if our work on "language processing" had by any chance been cut back lately. It seems that Congress has provided some separate funds to NSF for the purpose of rescuing any deserving work that other agencies may have had to cut; and apparently my name had been provided him in some way on a list of people who might have been cut. (After talking, we couldn't understand why I was on that list.) 1

I explained that we were getting another two years' support, at a slightly increased rate. He asked if we'd had to change our course significantly. I'm sure that I wasn't particularly coherent, but I tried to describe briefly how we had oriented the IPT proposal, toward developing and delivering service to people around the Network -- that while this wasn't as researchy an emphasis as we had been following in earlier years, it was consistent with a longer-term strategy of more involvement with other system developers. I didn't use the term "Bootstrap Community," but I did mention that we were gettin ready for an expanded level of activity that we hoped would involve many participants, and that I expected someday to come by and try to enlist them. ("Always ready to listen," he said.) 2

DCE 28-DEC-71 7:56 8309

Phone Log: Dr. Thomas Keenan of NSF, searching for researchers whose funds had been cut by other agencies

(J8309) 28-DEC-71 7:56; Title: Author(s): Douglas C. Engelbart/DCE; Distribution: Douglas C. Engelbart/DCE; Sub-Collections: SRI-ARC; Clerk: DCE;

the proof is in the pudding 1

(J8310) 28-DEC-71 9:43; Title: Author(s): Marilyn F. Auerbach/MFA; Distribution: Joel B. Levin/JBL; Sub-Collections: SRI-ARC; Clerk: MFA;

EMC Meetings Notes, December 22 and 27, 1971

These notes cover the December 22 and 27 meetings. 1

These two meetings were spent on the subject of the "Hardware Emergency". The plan for dealing with this emergency is briefly: 2

Phase I 2a

1. Crash effort to obtain usable documentation in the device interface area. This includes handshaking procedures, cabling documentation, indicator lights, manual operations, error indicators and routines, etc. 2a1

2. Obtaining help from software people in documenting error procedures, and writing diagnostics. 2a2

3. Obtain help from Roger, Lucky and other outside people in documenting and training. 2a3

4. Reduce the load on VanDeRiet so that he can become more deeply involved in training and documentation. 2a4

The following is a list of tasks and the people who will take care of them. 2a5

a. Negotiate Pager Maintenance Proposal with DEC (Watson). 2a5a

b. DiscPak follow up: 2a5b

Cable ordering and checking (Ratliff) 2a5b1

Power requirement checking (Ratliff) 2a5b2

Software requirements determination (Irby) 2a5b3

Display panel documentation (Hardeman) 2a5b4

Error indication and documentation (Hardeman) 2a5b5

c. Follow through on memory experiments. (Kudlick) 2a5c

d. Negotiations with Bryant on future maintenance and performance of the disc (Watson) 2a5d

e. Specify and order motor generator set (Kudlick) 2a5e

f. Manage the shop move (Ratliff & Cone) 2a5f

g. Negotiate January 8 help from Bryant (Watson) 2a5g

h. Hire new man to dump disc when we change the time to 6PM (Norton) 2a5h

i. Call and schedule interviews for hardware applicants (Norton) 2a5i

j. Check the network at 5AM (Watson) 2a5j

k. Evaluate and order magnetic tape demagnetizing and cleaning equipment (Hardeman) 2a5k

l. Negotiate purchase of BBN Network Interface (Melvin) 2a5l

m. Expedite delivery of Pager Maintenance Manual (Melvin) 2a5m

n. Define the overall logging problem and work on the solution (Kudlick) 2a5n

Phase II 2a6

Phase II begins after the Disc Paks are installed. Plans for Phase II will be described later. They deal with future use of the disc, final solution of the documentation problem, and general upgrading of the hardware and diagnostics. 2a6a

EMC Meetings Notes, December 22 and 27, 1971

(J8311) 28-DEC-71 9:46; Title: Author(s): Ed K. Van De Riet/EKV; Distribution: Richard W. Watson, Charles H. Irby, Ed K. Van De Riet, James C. Norton, Douglas C. Engelbart/EMC DCE; Sub-Collections: SRI-ARC EMC; Clerk: BER;
Origin: <VANDERIET>EMC2227DECNOTES.NLS;3, 28-DEC-71 9:42 BER ;

DCE 28-DEC-71 10:04 8312

Phone log: Larry Roberts called, discussed mini-terminal and supplementary NSF funding of ARC research

About the Hand Held Personal Terminal -- he is writing a paper on the idea, and wanted to check some of the inputting possibilities. 1

I told him that George Eilers had set up and was about ready to launch some learning tests, using a Link computer and a visual display. Mentioned aso that George felt that the critical engineering problem was the power drain for sustaining a display on theplasma-panel. 1a

But apparently Larry discounts this problem, feeling that with the phosphor-brightened technique that IPT has been helping to develop, display-maintnance drain would be only about a tenth of watt for a 1" x 2.8" panel having 80 dislay points per inch. (He assumes a space allotment per character of 7x10 display points, embedding a 5x7 character matrix.) 1a1

He says that he has to "argue them (the manufacturer) down" from saying that it would take 10 watts. 1a2

Larry feels that the major power drain would be in the receiver -- but this assumes a constant-standby mode, with the display turned on only during the occassional send/receive periods. 1a3

He feels that the toughest problem of all is likely to be the encryption. Neither of us knew whether or not anyone at SRI would be particularly qualified to work on that one. 1b

I asked him about considering some intermediate-stage applications that wouldn't require full-blown development, e.g. before developing the miniaturized radio-communication hardware, we could build some "long-wire" models that otherwise could have same shape and size, and then find uses for them around here that would give us experience useful for the purpose of analysis and evaluation. Or, find other suitable task environments for the same purpose. He seemed a little reluctant, but I think he acquiesed that this may be a reasonable development strategy. 1c

I mentioned Keenan's call (Journal, 8309,), about the NSF money for otherwise cut-back research. Larry knew about it, saying that he thought that it was about $5M of FY72 money. My name had been put on the list because Larry was figuring that the money ARC is committing to NIC represents resources that were diverted (like a "cut") from the research we would otherwise do. He assumed that we would like the chance to make that up. 2

DCE 28-DEC-71 10:04 8312

Phone log: Larry Roberts called, discussed mini-terminal and supplementary NSF funding of ARC research

We then talked a little about future support for "augmentation." Nothing conclusive came of it: I said that I assumed from what was said at the IPT contractors' meeting that computers for helping people do problem solving had lost its sales appeal in the DOD-Congres marketplace, and that in a sense he was doing us a favor to put us into the "distributed information systems," 6.2 category; and he said some things about our work on office systems, for integratng secretaries etc., was important, but yes it wasn't what DOD considered to be in their research bag. 2a

I felt uneasy about this "secretarial-level, office ..." type of labelling, and tried to see if he understood our aim at considering the "whole intellectual workshop" picture, in which of course the integration of secretarial activities is necessary, and if he realized that there was much else in the tough, intellectual domains that we also consider. And I tried a bit to sound him out on the what he thought the human working environment would be into which the (someday) forthcoming AI developments would be integrated; and also I tried to describe a bit about the possible strategy of AI work wherein partially developed capabilities could be integrated usefully into a mixed environment of human/computer processes to make a useful contribution before larger "stand-alone" artificial-iintelligence capabilities could practially be made available. 2b

(I'm afraid that on all of these topics I drew blsnk response, and assume that I didn't produce a meaningful picture in his mind. Damn, I really need to produce some essays that get some of these ideas communicated, so discussion of their merits isn't always beclouded by strong suspicion that the ideas aren't understood.) 2b1

Left it that I would call Keenan back to at least explain that now I appreciated why my name was on the list. Left it open (between Larry and me) as to whether or not we (ARC) would solicit "makeup" funds from NSF. 2c

DCE 28-DEC-71 10:04 8312

Phone log: Larry Roberts called, discussed mini-terminal and supplementary NSF funding of ARC research

(J8312) 28-DEC-71 10:04; Title: Author(s): Douglas C. Engelbart/DCE; Distribution: George J Eilers, James C. Norton, Richard W. Watson/GJE JCN RWW; Sub-Collections: SRI-ARC; Clerk: DCE;

MFA 28-DEC-71 10:36 8313

test

this is a test to see if online distribution is working 1

MFA 28-DEC-71 10:36 8313

test

(J8313) 28-DEC-71 10:36; Title: Author(s): Marilyn F. Auerbach/MFA; Distribution: Charles H. Irby, Joel B. Levin, John T. Melvin, Marilyn F. Auerbach/CHI JBL JTM MFA; Sub-Collections: SRI-ARC; Clerk: MFA;

EMCAGENDA

(Journal) Journal Documents (most recent first) 1

HGL 27-DEC-71 13:13 8307
NEW NLS
Location: (Journal, 8307, 1:w) 1a

DVN 27-DEC-71 9:25 8299
A catalog Maker's Diary
Location: (Journal, 8299, 1:w) 1b

BLP 21-DEC-71 17:47 8297
Reply to 8179 -- Toward a More Consistent Command Language in NLS
Location: (Journal, 8297, 1:w) 1c

KEV 21-DEC-71 10:32 8293
new jsys - strmt
Location: (Journal, 8293, 1:w) 1d

RLD 16-DEC-71 11:40 8229
an exercize sample.
Message: dear dick,
if things are working, you'll get this letter. 1e

PL 16-DEC-71 11:40 8228
message number 1
Message: the system is encouraging 1f

have you heard the story about one man's personal hell? it involves a
chute through which he falls and ends up in a mundane room with two very
middle class looking people playing terribly mundane songs on a piano in
annoyingly bland voices. such is the state of this concept of hell: one
supposedly "hip" (this brrr 2

(anyway, this brings us to whatever the correct definition of "hip"
really is. . .) guy who cannot stand the idea of spending the rest
of eternity with two middle class and mundane people. . .end. 2a

(this is actually supposed to really be what hell is--in this case
it is this particular room for this particular guy--
it is something like sartre's "no exit" but tends to have a

bit more
humor to it than sartre's. . .)i suddenly felt the need for
further explanation since upon re-reading this message i
wasn't
sure that it was making any sense . . . this then is my
explanation for
this explanation. . .

2a1

the overworked use of mundane is designed to be expressive of
that
very word. . . 2b

this seems to have finally worked. . . 3

now is the time for all good dogs to bark

4

people to come to the aid 4a

except who want today to come for the rest 4b

unless it's not ready for it 4c

you should attempt new things 5

even if it seems hard 5a

try anything once 5b

then do it again 6

what time is it right now i wonder? 7

now everything is where i want it 8

Here is an on line paper advancer 9

["Lores"/"pottos"]; 10

some junk (nic,locator,2:x) 11

(nic, locator, 1*xm) 12

(nic, locator, 1:xm) 13

EMCAGENDA

(J8314) 28-DEC-71 11:08; Title: Author(s): Ed K. Van De Riet/EKV;
Distribution: Douglas C. Engelbart, Richard W. Watson, Charles H. Irby,
Ed K. Van De Riet, James C. Norton/DCE EMC; Sub-Collections: SRI-ARC
EMC; Clerk: PL;
Origin: <LISTER>PL.NLS;7, 27-DEC-71 13:23 XXX ;

NOTES FROM MEETING ON COMMAND LANGUAGE EVOLUTION 1

Treat NLS uniformly as collection of subsystems. 2

Need way to move between subsystems. 3

As commands increase in number there will be different proficiency profiles across the system for users, i.e., novice in many parts, expert in some, etc. 4

The above implies more attention needed for a spectrum of modes, novice to expert, with better online help. 4a

Need automatic setup of a users parameters when he enters, possibly a need for more extensive facilities, such as macros 5

Some complex commands or subsystems might have abbreviated versions at the top level. 6

General feeling that DNLS, TNLS, and DEX should be as consistent as possible. 7

Charles' proposal generally accepted except that in address expressions some confusion about putting bug mark as part of expressions. 8

Conclusion: Charles to rework his proposal based on input to date and send back to everybody. 9

RWW 28-DEC-71 11:50 8315

Notes from Meeting on Command Language Evolution

(J8315) 28-DEC-71 11:50; Title: Author(s): Richard W. Watson/RWW; Distribution: Charles H. Irby, William S. Duvall, William H. Paxton, Douglas C. Engelbart, James C. Norton, Walter L. Bass, Marilyn F. Auerbach, Dirk H. van Nouhuys, Bruce L. Parsley, Walter L. Bass, Harvey G. Lehtman, Mary S. Church, John T. Melvin, Don C. Wallace/CHI WSD WHP DCE JCN WLB MFA DVN BLP WLB HGL MSC JTM DCW; Sub-Collections: SRI-ARC; Clerk: RWW;
Origin: <WATSON>CLEMEETING.NLS;2, 28-DEC-71 11:48 RWW ;

I am extremely sorry for the long delay in answering your letter of October 4--it is an unpardonable delay, but all of my correspondents have been similarly mistreated during a particularly trying period for me. 1

I am enclosing six items; a list of our publications, and five publications that should provide you with a rather complete picture of our activities. 2

About your interest in how people learn to use our system; I don't think that we have much in the way of formal material to answer such a query. It has long been one of my plans that we evolve a regular activity concerned with testing and training the people working on and with our augmentation systems. My main difficulty in getting such an activity launched has been the persistent dominance among the resource demands within our experimental activity of the "instrumentation" that we needed to develop--there is now an unbelievable amount of architectual and organization detail in our whole hardware-software system. I gain a certain consolation in realizing that this instrumentation is now getting into such shape as to provide a really exceptional laboratory in which we could develop and apply the associated testing and training techniques. 3

We have been giving some two-day courses for people who plan to use our system through the ARPA Network; but these trainees haven't yet made enough use of the system to realize how much of the necessary knowledge and skill that the two days really provided them. Our own people, over the years, have been trained informally. Our observations are that one can achieve a useful proficiency in from five to twenty hours, but will still be improving at six months. 4

Please let me know if we can help you further; I promise to be prompt next time. 5

Sincerely,

Douglas C. Engelbart, Manager
Augmentation Research Center

ber

Stanford Research Institute
Augmentation Research Center
333 Ravenswood Avenue
Menlo Park, California 94025

Dr. Sylvia R. Mayer
Research Psychologist
Technology Applications Division
Electronic Systems Division (AFSC)
Laurence G. Hanscom Field,
Bedford, Massachusetts 01730

Dear Dr. Mayer:

(J8316) 28-DEC-71 12:27; Author(s): Douglas C. Engelbart/DCE;
Sub-Collections: SRI-ARC; Clerk: DCE;
Origin: <ENGELBART>LMAYER.NLS;11, 28-DEC-71 12:25 DCE ; ***

MFA 28-DEC-71 13:59 8317

this is the second time i've tried to send you a message - your IDENTFILE entry had you marked for hardcopy delivery. I changed it to online. Also, there's some problem about BBN-IMP vs. BBN-NET. John hopes to get the ident BBN-NET expunged for all you and yours. 1

(J8317) 28-DEC-71 13:59; Title: Author(s): Marilyn F. Auerbach/MFA; Distribution: Joel B. Levin, Marilyn F. Auerbach, Barbara E. Row/JBL MFA BER; Sub-Collections: SRI-ARC; Clerk: MFA;

An Example

THis is one statement 1

And this is another 2

And this is yet another 3

And this is a lower level statement (whcih you needn't use unless you want to) 3a

An Example

(J8318) 28-DEC-71 14:21; Title: Author(s): William S. Duvall/WSD;
Distribution: Robert D. Bressler/RDB2; Sub-Collections: SRI-ARC; Clerk:
WSD;
Origin: <DUVALL>EXAMPLE.NLS;1, 28-DEC-71 14:13 WSD ;

this is a test message to myself 1

(J8319) 28-DEC-71 14:33; Title: Author(s): Jon B. Postel/JBP; Distribution: Jon B. Postel/JBP; Sub-Collections: NIC; Clerk: JBP;

nwg notes

(J8320) 28-DEC-71 14:47; .HJOURNAL="JBP 28-DEC-71 14:47 8320";
Title: Author(s): Jon B. Postel/JBP; Distribution: Jon B.
Postel, David C. Wood/JBP DCW2; Sub-Collections: NIC; Clerk: JBP;
Origin: <UCLA-7>JBP.NLS;7, 23-NOV-71 17:02 XXX ;

nwg notes

(J8320) 28-DEC-71 14:47; Title: Author(s): Jon B. Postel/JBP;
Distribution: Jon B. Postel, David C. Wood/JBP DCW2; Sub-Collections:
NIC; Clerk: JBP;
Origin: <UCLA-7>JBP.NLS;7, 23-NOV-71 17:02 XXX ;

ALC 28-DEC-71 14:55 8322

test message

this is a comment ?

ALC 28-DEC-71 14:55 8322

test message

this is a test message to jon postel 1

ALC 28-DEC-71 14:55 8322

test message

(J8322) 28-DEC-71 14:55; Title: Author(s): Anita L. Coley/ALC;
Distribution: Jon B. Postel/JBP; Sub-Collections: NIC; Clerk: ALC;

To my intense embarrassment, I have just discovered your 30 August letter -- apparently I set it aside in order to collect for you the extra information you asked for, and somehow it got lost. I am very very sorry. 1

In answer to your specific points: we have no further information available as to the general implementation and architecture of our system. However, we do have some technical descriptions of our system programming language (L10) and of the TREE META system, as they currently are implemented on our PDP-10. My secretary is sending these papers to you in a separate mailing. 2

Sincerely,

Douglas C. Engelbart, Manager
Augmentation Research Center

ber

Stanford Research Institute
Augmentation Research Center
333 Ravenswood Avenue
Menlo Park, California 94025

Mr. N.E. Wiseman
University of Cambridge
Computer Laboratory
Corn Exchange Street
Cambridge CB2 3QG

Dear Mr. Wiseman:

(J8323) 28-DEC-71 14:54; Title: Author(s): Douglas C. Engelbart/DCE;
Sub-Collections: SRI-ARC; Clerk: DCE;
Origin: <ENGELBART>WISELETTER.NLS;2, 28-DEC-71 14:13 DCE ; ***

To my intense embarrassment, I have just discovered your 30 August letter -- apparently I set it aside in order to collect for you the extra information you asked for, and somehow it got lost. I am very very sorry. 1

In answer to your specific points: we have no further information available as to the general implementation and architecture of our system. However, we do have some technical descriptions of our system programming language (L10) and of the TREE META system, as they currently are implemented on our PDP-10. My secretary is sending these papers to you in a separate mailing. 2

Sincerely,

Douglas C. Engelbart, Manager
Augmentation Research Center

ber

Stanford Research Institute
Augmentation Research Center
333 Ravenswood Avenue
Menlo Park, California 94025

Mr. N.E. Wiseman
University of Cambridge
Computer Laboratory
Corn Exchange Street
Cambridge CB2 3QG

Dear Mr. Wiseman:

(J8324) 28-DEC-71 15:01; Title: Author(s): Douglas C. Engelbart/DCE;
Sub-Collections: SRI-ARC; Clerk: DCE;
Origin: <ENGELBART>WISELETTER.NLS;2, 28-DEC-71 14:13 DCE ; ***

A new version of the Folklore file must be distributed in hardcopy ASAP. It's pretty much up to date except for the super new - thank you - stuff added this (12:475) week. Would each of you please document your (significant) changes vis the <nls>status file so I can wrap up Folklore. Thanks... 1

(J8325) 28-DEC-71 15:02; Title: Author(s): Marilyn F. Auerbach/MFA; Distribution: Charles H. Irby, William S. Duvall, Mary S. Church, Harvey G. Lehtman/CHI WSD MSC HGL; Sub-Collections: SRI-ARC; Clerk: MFA;

JBP 28-DEC-71 15:11 8326

Notes from the October NWG Meeting

Report of the Protocol Workshop 1

12 October, 1971 1a

Introduction 2

This is a report on the decisions reached at the protocol workshop held in conjunction with the Network Working Group meeting held in Cambridge from 10 to 14 October, 1971. 2a

The workshop addressed itself to protocols of four types: IMP-Host, Host-Host, Initial Connection, and Process-Process. 2b

IMP-Host Protocol 3

The idea of IMP provided status reports to be exchanged via new IMP-Host protocol messages was discussed and rejected because it was felt that the level of state information which could be reported was not sufficient to be worth the trouble of implementing this mechanism. 3a

Host-Host Protocol 4

The Host-Host Protocol was discussed and several problems were brought to light, among them were the following listed together with the group's recomendations. 4a

The GVB - RET mechanism may prove useful sometime in the future so it will be retained though no one appears to be using it now, however spontaneous RET commands are explicitly prohibited. 4a1

The ECO - ERP commands are useful and should be supported, but spontaneous ERP commmands are explicitly prohibited. A further restriction is that a second ECO will not be sent until the first ECO has been answered. Note that any of the following may be an answer to an ECO: ERP, RST, "Destination dead", or "Incomplete transmission". 4a2

The RST - RRP commands are useful, but the proper use of these commands for determining the status of host software is still open for discussion (please direct comments to Jon Postel), however spontaneous RRP commands are explicitly prohibited. 4a3

The problem of unmatched CLS commands was discussed and four "solutions" were proposed: 4a4

Hold forever 4a4a

Send a RST and clear the entry 4a4b

Clear the entry and possibly mess up a future connection 4a4c

Assign socket numbers in a sequential fashion to reduce the possibility of confussion and clear the entry 4a4d

Note that the first two suggestions follow the protocol while the last two do not. 4a5

The idea of flow control on the control link was suggested. A Request for Comments is to be prepared exploring this idea more fully. 4a6

The usefullness of the ERR command is compromised if the receiver mearly throws it away. Thus ERR's are to be logged, if at all possible, and checked out with the sending site. 4a7

The NCP document should make clear the implicatinns of queueing or not queueing STR & RTS commands. 4a8

Initial Connection Protocol 5

The Initial Connection Protocol (ICP) was discussed and found to be satisfactory however the following points were stressed: 5a

The socket number sent by the logger (S) must be in agreement with the socket numbers used in the STR & RTS sent by the logger. 5a1

The implications of queueing or not queuing of RTS & STR commands should be made clear in the ICP document. This is particularlly important if the user chooses the "listen" option. 5a2

Telnet Protocol 6

The Telnet commmittee has been reactivated to consider the following problems: 6a

Clarification of the terminology half duplex, full duplex, character mode, line mode, ASCII, and echoing. 6a1

Clarification of the end of line convention. Especially to answer the question "Should there be a special end-of-line character?". 6a2

Clarification of the conditions for leaving Hide-your-input mode. 6a3

Clarification of the operation of Break and Synch. 6a4

Specification of a server-to-user Synch. 6a5

Clarification of the definition of the Network Virtual Terminal. 6a6

Preperation of a new document defining the Telnet protocol with the above improvements. 6a7

The protocol workshop did agree that: 6b

It is the servers option for disconnection to imply logout or not. 6b1

It is the servers option for logout to imply disconnection or not. 6b2

Extra characters used locally to fill the time for format effectors to take effect should not be sent over the network. 6b3

Synch means to examine the data stream from the current point to a data mark (x'80'). If any break type characters (e.g. etx, sub, Break) are found they are to have their normal effect. 6b4

Upper and lower case are to be available to all Telnet users. 6b5

Data and File Transfer Protocol 7

The Data and File Transfer Committee will report separately. 7a

JBP 28-DEC-71 15:11 8326

Notes from the October NWG Meeting

(J8326) 28-DEC-71 15:11; Title: Author(s): Jon B. Postel/JBP; Distribution: Jon B. Postel, David C. Wood, Alex A. McKenzie/JBP DCW2 AAM; Keywords: Protocol Telnet Network NCP ICP; Sub-Collections: NIC; Clerk: JBP;
Origin: <UCLA-7>NWG-MEMO.NLS;19, 15-DEC-71 15:16 JBP ;

Thank you for your letter of 22 November asking if I could contribute a short paper for your Newsletter. If it makes you feel less neglected about not getting a paper, I must shamefacedly admit that the last two months got so out of hand that I am only now catching up on my correspondence from October. That kind of performance does not argue well for my becoming committed to any near future publishing. 1

I wish you would keep me in mind for some later time, however, because there are some things that I would like to communicate to such a readership as yours. 2

Sincerely,

Douglas C. Engelbart, Manager
Augmentation Research Center

ber

Stanford Research Institute
Augmentation Research Center
333 Ravenswood Avenue
Menlo Park, California 94025

Professor Bryan R. Noton
Engineering Design Laboratory
Washington University
Campus Box 1185
Saint Louis, Missouri 63130

Dear Professor Noton:

(J8327) 28-DEC-71 15:06; Title: Author(s): Douglas C. Engelbart/DCE;
Sub-Collections: SRI-ARC; Clerk: DCE;
Origin: <ENGELBART>NOTONLETTER.NLS;1, 28-DEC-71 14:17 DCE ; ***

I am sorry about the difficulty in communicating with you. Due to some unfortunate circumstances, my correspondence quite broke down this fall. I have no record of an earlier letter, only your second message of November 15. 1

My research center is very actively involved with the ARPA Computer Network (which is what I assume you are referring to). We have in fact established a service to the participants of this network, that we call the Network Information Center (NIC). I am sending you five reprints of papers describing various aspects of the ARPA Network (NIC 4565, 4567, 4568, 7542, 7750). I am also sending one reprint of a paper describing the general nature of our research center here at SRI (3954), and two of our NIC memos (4792 and 8158) that will give you a flavor of the NIC activities. I am also sending a list of our project publications. 2

Not knowing what your particular interests are, I can only hope that this information will serve your need. If not, please let us know. 3

Sincerely,

Douglas C. Engelbart, Manager
Augmentation Research Center

ber

Stanford Research Institute
Augmentation Research Center
333 Ravenswood Avenue
Menlo Park, California 94025

Dr. F. W. Hogesteeger
P.O. Box 1125
Ryswyk Z.H.
NETHERLANDS

Dear Dr. Hogesteeger:

(J8328) 28-DEC-71 15:07; Title: Author(s): Douglas C. Engelbart/DCE;
Sub-Collections: SRI-ARC; Clerk: DCE;
Origin: <ENGELBART>HOGESTEEGERLETTER.NLS;2, 28-DEC-71 14:42 DCE ;
***

My sincere apology for the tardy answer to your letter of 7 November. The FJCC session on "The User Interface for Interactive Search" did not include any written contributions (it was a panel discussion). I am enclosing an earlier reprint describing the nature of my general activity (3954). I would need to know more about your particular interests in order to provide more explicit service to you; but if you have need, let me know. 1

Sincerely,

Douglas C. Engelbart, Manager
Augmentation Research Center

ber
Encl.

Stanford Research Institute
Augmentation Research Center
333 Ravenswood Avenue
Menlo Park, California 94025

Mr. Alexander Hill
Technion--Israel Institute of Technology
Department of Computer Science
Technion City, Haifa
ISRAEL

Dear Mr. Hill:

(J8329) 28-DEC-71 15:09; Title: Author(s): Douglas C. Engelbart/DCE;
Sub-Collections: SRI-ARC; Clerk: DCE;
Origin: <ENGELBART>HILLETTER.NLS;1, 28-DEC-71 14:22 DCE ; ***

Happy New Year and thank you very much for the thoughtful note of October 25. You needn't feel individually slighted by the tardy delay -- I got into one of my periodic cycles of confusion, and actually am only just today reaching back into October's correspondence (would you believe it?). 1

Yes, our progress since the good old days really has been rather remarkable -- but the truth is that I often have to look at it over that big a span in order to feel enough sense of progress to bolster my sagging psyche during some of the tough days; but it also helps very much to get a nice letter from an old friend. 2

Your last paragraph had an explicit suggestion about classification/sorting schemes of current states in technologies and sciences. As a matter of fact, that is one of the specific and first-order segments of our next stage of operations, wherein we are hoping to turn the corner and really begin reaching out with our tools and techniques to interact with the world. This bigger plan relates to your comment in your first paragraph "...until you can have general and practical exposure, your augmentaion concepts will be as improbable to the public as space travel or human habitation of other planets". Yes, it is quite apparent that we need to communicate. One problem over the years has been that while it was quite easy to get people very turned on to the sorts of things we could show in our laboratory, we really couldn't offer them any guidance as to what they could do about it. For that reason I have been concentrating more on getting into a position where we could tell them what they could do about it rather than using our energy for getting more people turned on. I think that within a year we can begin trying to turn them on, and to this end Nilo's article is a very nice help. 3

Thank you again for your note, Barbara, and best wishes to you. 4

Sincerely,

Douglas C. Engelbart, Manager
Augmentation Research Center

ber

Stanford Research Institute
Augmentation Research Center
333 Ravenswood Avenue
Menlo Park, California 94025

Ms. Barbara E. White, Supervisor
Technical Information Center
Space Division
North American Rockwell
12214 Lakewood Boulevard
Downey, California 90241

Dear Barbara:

(J8330) 28-DEC-71 15:13; Title: Author(s): Douglas C. Engelbart/DCE;
Sub-Collections: SRI-ARC; Clerk: DCE;
Origin: <ENGELBART>BARBLETTER.NLS;1, 28-DEC-71 14:30 DCE ; ***

Thank you for your note of November 5; and my apologies for the tardy response. I am enclosing a reprint (3954) that describes with relative thoroughness the nature of our work here -- at least of the technical developments. What is described therein is pretty much the "instrumentation" for the experiments in organization and working method that provide the real challenge to this business of augmenting people. Unfortunately, our resources over the last decade have been so heavily absorbed in the development of these tools, that there is really now clear development or publication available in the matters of augmentation and method. If you have further, more specific questions, please let me know. 1

Sincerely,

Douglas C. Engelbart, Manager
Augmentation Research Center

ber
Encl.

Stanford Research Institute
Augmentation Research Center
333 Ravenswood Avenue
Menlo Park, California 94025

Denver, Colorado 80206

Dear Mr. Bryden:

(J8331) 28-DEC-71 15:16; Title: Author(s): Douglas C. Engelbart/DCE;
Sub-Collections: SRI-ARC; Clerk: DCE;
Origin: <ENGELBART>BRYDENLETTER.NLS;1, 28-DEC-71 14:36 DCE ; ***

Thank you for your note of November 5; and my apologies for the tardy response. I am enclosing a reprint (3954) that describes with relative thoroughness the nature of our work here -- at least of the technical developments. What is described therein is pretty much the "instrumentation" for the experiments in organization and working method that provide the real challenge to this business of augmenting people. Unfortunately, our resources over the last decade have been so heavily absorbed in the development of these tools, that there is really now clear development or publication available in the matters of augmentation and method. If you have further, more specific questions, please let me know. 1

Sincerely,

Douglas C. Engelbart, Manager
Augmentation Research Center

ber
Encl.

Stanford Research Institute
Augmentation Research Center
333 Ravenswood Avenue
Menlo Park, California 94025

Mr. William Bryden
Elmer Fox & Company
Certified Public Accountants
275 University Boulevard
Denver, Colorado 80206

Dear Mr. Bryden:

(J8332) 28-DEC-71 16:14; Title: Author(s): Douglas C. Engelbart/DCE;
Sub-Collections: SRI-ARC; Clerk: DCE;
Origin: <ENGELBART>BRYDENLETTER.NLS;2, 28-DEC-71 16:10 DCE ; ***

I am extremely sorry to be so late in responding to your letter of September 30. I am pleased by your interest and I hope that what I can communicate will be of some value to you. 1

In answer to the particular questions in your letter: our CRT's are capable of generating vectors as well as alphanumerics (we use the 96-character ASCII set). But as a matter of fact, we as yet have made no significant use of the vector capability. This stems from our "bootstrapping" approach in which the tools we build are those calculated to do us the most good when used wihin our own working environment. With regard to vector drawings, we as yet have no practical means for producing quick hardcopy printouts that have mixed text and graphics on them; and this reduces the value to us of graphic manipulation too low to warrant maintenance as part of our tool kit. I am trying rather desperately to acquire the hardware that will break this bottleneck and let us produce draft-copy printout of whatever mixture of text and graphics we work with on our CRT displays. 2

Your second question asked how we "distinguished between the problems of information or sign transfer, and the problems of knowledge or concept transfer". We have spent by far the larger amount of our resources of the past ten years in the sign-transfer domain. This is not at all to ignore the concept-transfer matter; the instrumentation of our sign-transfer means had to precede experimentation with the new modes of concept transfer that will thus become available to the human. A fair number of the conventions in structure and syntax that we have adopted have as prime purpose the facilitation of the visualization, organization, and transfer of concepts. 3

I am sending you three of our publications (5255, 3906, 3954), as well as our Center's publication bibliography, in a separate mailing. 4

I welcome your further questions and comments. I would be interested in learning of the potential applications toward which you have been writing a proposal "for a project in this area". 5

Sincerely,

Douglas C. Engelbart, Manager
Augmentation Research Center

ber

Stanford Research Institute
Augmentation Research Center
333 Ravenswood Avenue
Menlo Park, California 94025

Mr. A.J.N. Judge
Assistant Secretary General
Union Des Associations Internationales
1, Rue Aux Laines
1000 Bruxelles BELGIQUE

Dear Mr. Judge:

(J8333) 28-DEC-71 16:24; Title: Author(s): Douglas C. Engelbart/DCE;
Sub-Collections: SRI-ARC; Clerk: DCE;
Origin: <ENGELBART>JUDGELETTER.NLS;1, 28-DEC-71 15:07 DCE ; ***

Proposal for Control Language for Primitive Source Level Debugger
(Updates 8162)

Commands 1

'B<reakpoint > 1a

'C <lear> ('A<ll> CA / ((VALUE /) CA <NUMBER , VALUE>) 1a1

This command is used for clearing a breakpoint. 1a1a

If All is specified, all breakpoints are removed. 1a1b

If a VALUE is specified, then the breakpoint to be removed is selected according to the algorithm used in the Replaces Option in setting breakpoints. 1a1c

If this field is left empty, the breakpoint to be removed is assumed to be the last one which was executed. 1a1d

After the breakpoint has been cleared, the breakpoint number and address of the breakpoint are typed. 1a1e

'P <rint> ('A<ll> / VALUE /) CA 1a2

Prints the status of the breakpoint(s) indicated. 1a2a

Breakpoints to be printed are identified in a manner analogous to that used in the Breakpoint Clear command. 1a2b

'S<et> VALUE $(C. ('C<all> PNAME / 'R<eplaces> VALUE /
'T<est> VALUE ['= VALUE])) CA <NUMBER> 1a3

If location indicated by address is a stack manipulation instruction, address is incremented by one (and check is made again). 1a3a

If the Replace option is indicated, the VALUE is checked to see if it is a legitimate Break point number. 1a3b

If it is, that number is assigned to this breakpoint, and any previous breakpoint of that number is cleared. 1a3b1

If the VALUE is not a legitimate breakpoint number, then it is assumed to be an address. 1a3b2

The breakpoint table is searched for a breakpoint at that address (the address is evaluated like a breakpoint address with regard to stack

manipulation instructions), and if found, that breakpoint is replaced by the one currently being specified. 1a3b2a

If a matching breakpoint is not found, a warning message is displayed. 1a3b2b

If the Replace option is not specified, then the first available breakpoint in the table is assigned. 1a3c

If the Call option is specified, then the breakpoint becomes a conditional breakpoint. 1a3d

Whenever the instruction in the breakpoint location is executed, the procedure specified by the Call option is called. 1a3d1

If that procedure returns true, the breakpoint is executed. 1a3d2

Otherwise, the instruction normally occupying the break location is executed, and the breakpoint is ignored. 1a3d3

The Test option specifies that the location specified by the first VALUE is compared to the value of the second VALUE, and the break is executed if they are equal. 1a3e

If the '= VALUE is omitted, the test is made against non-zero. 1a3e1

The breakpoint table is set up when the user executes a 'Go or Proceed command, and restored whenever a breakpoint is executed. 1a3f

The table entry format is as follows: 1a3f1

Word 0: location of breakpoint instruction. 1a3f1a

Word 1: The Instruction replaced by the breakpoint call 1a3f1b

This will be set to -1 if the break is not active. 1a3f1b1

Word 2: Conditional Testing Instruction 1a3f1c

If the CALL option has been specified, this

cell will contain a CALLO p, where p represents the test procedure. 1a3f1c1

IF the test option was specified, this word will contain an instruction which will load the contents of the specified test location. 1a3f1c2

IF this is a normal breakpoint, this word will contain a JRST to the breakpoint execution code. 1a3f1c3

The reason for using an instruction as the contents of this cell rather than a simple flag is that it opens the way towards easy implementation of more elaborate options later on. 1a3f1c3a

Word 3: 1a3f1d

Value for comparison with Test Location. 1a3f1d1

Will be set to 1 if test option has not been specified. 1a3f1d2

'C<ontinue> CA 1b

This causes execution of the program to continue after a breakpoint. 1b1

Breakpoints and registers are set up as in Go. 1b1a

'G<oto> VALUE [C. <Stack Frame = > STACKREF] CA 1c

This causes control to be transferred to location indicated by VALUE. 1c1

Breakpoints are set up, and the registers are set first. 1c1a

IF the stack frame is indicated, the stack is cut back to that level before the control transfer. 1c2

'P<rocedure > 1d

'B<ack up to> PNAME CA 1d1

This causes the undo-ing of a Replace. 1d1a

In otherwords, it restores the original procedure. 1d1b

The PNAME used should be that of the procedure being restored, e.g. if P1 has been replaced by P2, THEN P1 is restored by a Back up to P1 CA. 1d1c

If the indicated procedure has not been replaced, an appropriate message is displayed. 1d1d

'C<all> PNAME ('([VALUE $(', VALUE)] ') / 1d2

STACKREF/ 1d2a

) CA 1d2b

This allows the direct call of a procedure. 1d2c

When the called procedure returns, control is returned to the debugger. 1d2d

Following the PNAME is an optional parameter specification. 1d2e

If the parm spec is of the form of a normal procedure call parameeter list, the parms are stacked as in a normal procedure call, and the call is made. 1d2e1

If, however, a value is used, it is assumed to indicate a stack frame, and the stack frame is used as that of the procedure. 1d2e2

In this case, the procedure is not called normally, but rather is started at the first instruction following the set up of the stack. 1d2e2a

What do we do about strings ??? 1d2e2a1

If no parameters are specified, a CALL0 is executed. 1d2f

'R<eplace > PNAME CA <by> PNAME CA 1d3

This causes the indicated procedure to be replaced by a new one. 1d3a

The implementation of this is similar to breakpoints, in that it is accomplished by replacing the first instruction in the old procedure with a jump to the first instruction of the replacing procedure. 1d3b

A table is kept which contains the address of the replaced procedure, and the instruction replaced by the JRST. 1d3c

'S<how> (F<ield> / S<tring> / L<ocation> /) ADDRESS [C. MODESPEC CA] CA [VALUE CA] 1e

If Location or Empty is specified, the contents of the cell indicated by the address are displayed according to the current mode. 1e1

If the address specification was an advance address (i.e. LF or '↑), the advance mode is used as the default type-out mode. 1e1a

E.g., If on the previous command the user had specified that the cell was a string, and had subsequently typed a LF, the advance mode would have been set to text, and the indicated cell would be displayed as a string. 1e1a1

Otherwise, the advance mode is set to the permanent mode. 1e1b

If Field is specified, the address value is loaded into a register, and an indexed LDB instruction is done using the byte pointer addressed by RP. 1e2

If STRING is specified, The contents of the addressed cell are examined. 1e3

If the format of the addressed cell is compatible with the first word of an A-String, they are printed in the format '↑ 1$D ', 1$D '> (e.g. <100:23>) Where the first number is the maximum length of the string, and the second number is the actual length. 1e3a

The advance mode switch is set to text. 1e3a1

If the cell contents are not compatible with an A-String descriptor, an error is indicated. 1e3b

If a multiple-cell parameter (e.g. P or L) is specified, the contents of each cell (or field) are separated by CR's. 1e4

Mebbee we should try to cram more than one value on a line. 1e4a

```
   'V<alue of > VALUE [C. MODESPEC] CA                                  1f

      Prints the VALUE according to the modespec.                       1f1

      Advance mode is not affected by this command.                     1f2

Meta-Linguistic Variables                                               2

   ADDRESS = VALUE / STACKREF/ RELADR / MULTIADR                        2a

      MULTIADR = 'P/ %Parameters in this frame%                         2a1

         'L/ %Locals in this frame%                                     2a1a

         "STU"/ %Stack Trace Up%                                        2a1b

         "ST"/ "STD"; %Stack Trace Down%                                2a1c

      RELADR = '↑ / LF / TAB                                            2a2

      STACKREF = STACKSYM [ADOP NUMBER]                                 2a3

         STACKSYM = 'F / "FP"/ %Frame Pointer%                          2a3a

            'R / "RET"/ %Return Location for current frame%             2a3a1

             "SIG"/ %Signal Location for this frame%                    2a3a2

            'T / "TOP"/ %Top of Stack%                                  2a3a3

            'B / "BASE"/ %Base of stack%                                2a3a4

            'M / "MARK"; %Mark for this frame%                          2a3a5

      VALUE = PRIMARY [ADOP VALUE]                                      2a4

         ADOP = '+/ SP/ '-                                              2a4a

         PRIMARY = SPECSYM/ %Special Symbol%                            2a4b

            ID %Regular identifier%                                     2a4b1

            '; ID %Same as regylar identifier, exceop except that
            ID may be one of the SPECSYMS%                              2a4b2

            NUMBER/                                                     2a4b3

            '.; %Point.....value is current location%                   2a4b4
```

```
        SPECSYM = "LV"/ %Last Value typed%                              2a4c

            'P 1$D/ %Parameter in current frame, when number is
            parmeter number beginning with 1%                           2a4c1

            'L 1$D/ %Locals...like parameters%                          2a4c2

            "RP"; %Record Pointer%                                      2a4c3

               %Points to field used with field format printouts%       2a4c3a

    PNAME  = [ ';] ID                                                   2b

        PNAME is a Procedure Name                                       2b1

        A Pname differs from a normal ID in a value only
        semantically.                                                   2b2

        When a PNAME is called for in a syntax, the symbol is read,
        and the location indicated by the symbol is checked to make
        sure that it is a procedure as follows:                         2b3

            The instruction addressed by pname should be either a
            stack manipulation instruction, or a JUMPG S,SYSOVR.        2b3a

                If it is a stack manipulation instruction, the next
                instruction should be a JUMPG S,SYSOVR.                 2b3a1

            If it is a JRST, the address is checked against the
            replaced procedure table.                                   2b3b

            Otherwise, the name is rejected, and an error message is
            displayed.                                                  2b3c
```

WSD 28-DEC-71 16:54 8334

Proposal for Control Language for Primitive Source Level Debugger
(Updates 8162)

(J8334) 28-DEC-71 16:54; Title: Author(s): William S. Duvall/WSD;
Distribution: Charles H. Irby/CHI; Sub-Collections: SRI-ARC; Clerk: WSD;

DCW2 29-DEC-71 5:29 8335

to dave wood

dave,
did you get my last message?
ernie 1

DCW2 29-DEC-71 5:29 8335

to dave wood

(J8335) 29-DEC-71 5:29; Title: Author(s): David C. Wood/DCW2; Distribution: David C. Wood, Ernest H Forman/DCW2 EHF; Sub-Collections: NIC; Clerk: DCW2;

EHF 29-DEC-71 5:59 8336

john,

how have you been? for a short time this morning, when i asked to have branch zero printed all i had displayed was statement zero. this is apparently an intermittent problem because it cleared up by itself.

if a file is locked are you still supposed to be able to read it even if under another's id? i thought you were able to but couldn't this morning.

ernie forman 1

(J8336) 29-DEC-71 5:59; Title: Author(s): Ernest H Forman/EHF; Distribution: John T. Melvin, David C. Wood/JTM DCW2; Sub-Collections: NIC; Clerk: EHF;

RWW 29-DEC-71 10:27 8337

Note on Minor Tab Glitch

Mimi, there still seems to be one minor glitch in Tabs. The 0 tab when set as now to 8 is feedback as 9, but is output ok. 1

RWW 29-DEC-71 10:27 8337

Note on Minor Tab Glitch

(J8337) 29-DEC-71 10:27; Title: Author(s): Richard W. Watson/RWW; Distribution: Mary S. Church, Dirk H. van Nouhuys, Marilyn F. Auerbach/MSC DVN MFA; Sub-Collections: SRI-ARC; Clerk: RWW;

A proposal to establish software teams

I (CHI) propose that the NLS software people reorganize their time and commitments so that each major software task is being worked on by a team of two or three people and so that each person is a member of more than one such team. 1

I feel that this will have the following beneficial effects: 2

Each person will be involved in more projects, and consequently will interact with more people and have a better understanding of the progress and vector of the whole group. 2a

Designs will, on the whole, be better because more people will be involved. Designs which are done by one person in isolation tend not to fit in with the rest of the system as well as those done by groups of people who are interacting with the rest of the group. 2b

Implementation will be done by a team, thus allowing several people to take on the burden of maintaining and debugging the implemetation. Also, if one person leaves, others will be left who understand the implementation. 2c

More documentation will find its way to printed form -- thus smoother implementation and more logical bugs determined before implementation is begun. 2d

Joint responsibility for a task will provide good working relationships between co-workes. Co-workers will provide better sounding boards since they will have the same commitment and responsibility. 2e

One team member, the pusher, will have the additional responsiblity of knowing the status of the task and interfacing/negotiating with the buyers of that task. 2e1

Group morale should stay high since people will be involved in more tasks and will be talking to more people about technical matters. 2f

Having different team members for different tasks will help in the proccess of switching from one task to another. 2g

Decision procedures are left unspecified within the teams -- thus allowing natural dynamics to come into play. Basically, decisions will be made by aggreement, with the buyers and cordinators consulted to resolve serious disagreements. 2h

Each team member has a veto, which will cause the buyers and cordinators to be brought into the decision process. 2h1

Also, by limiting the size of each group to two or three people (with other people being consulted during big design sessions), the teams should be small enough to work effectively together. 3

Following is a first pass at setting up teams for working on the tasks currently in progress. Note that the team membership has been set up to minimize confussion during the changeover. If there is widespread acceptance of this notion, I will call a short meeting to discuss implementation details and initial team membership. The first member listed for each task is to be the pusher. 4

Current NLS software tasks 5

CURRENT TASKS	TEAMS, pusher first	
---	---	5b
MPS Development	WHP, HGL (JGM, LPD)	5c
Journal Maintenance	JDH, WSD	5d
Primitive NLS Debugger	WSD, JTM	5e
Identification System Maintenace	MSC, WSD, JDH	5f
NLS Cleanup	CHI, MSC, BLP	5g
LIT Collection by the Monitor	CHI, DIA	5h
Sequential Display Areas	CHI, WSD	5i
Control Environment	CHI, DIA	5j
File System Design	CHI, WLB, JDH	5k
NLS Maintenance	MSC, BLP	5l
Baseline Record System	BLP, WLB, WHP	5m
Catalog System	WLB, WHP, HGL	5n
Basic File System	JDH, WHP	5o
EXEC commands in NLS	JTM, BLP	5p
DEX-II	HGL, CHI, WLB	5q
DEX-I Maintenance	HGL, JTM	5r

CHI 29-DEC-71 18:34 8339

A proposal to establish software teams

(J8339) 29-DEC-71 18:34; Title: Author(s): Charles H. Irby/CHI; Distribution: Don Limuti, William R Ferguson, Priscilla Lister, Robert L. Dendy, Linda L. Lane, Marilyn F. Auerbach, Walter L. Bass, Mary S. Church, William S. Duvall, Douglas C. Engelbart, Beauregard A. Hardeman, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Mil Jernigan, Harvey G. Lehtman, John T. Melvin, Jeanne B. North, James C. Norton, Cindy Page, Bruce L. Parsley, William H. Paxton, Jeffrey C. Peters, Jake Ratliff, Barbara E. Row, Ed K. Van De Riet, Dirk H. van Nouhuys, Kenneth E. Victor, Don C. Wallace, Richard W. Watson, Don I. Andrews, L. Peter Deutsch, James G. Mitchell/SRI-ARC LPD JGM; Sub-Collections: SRI-ARC; Clerk: CHI;
Origin: <IRBY>SOFTTEAMS.NLS;11, 29-DEC-71 15:27 CHI ;

DCE 29-DEC-71 19:00 8340

Visit log: J.C.R. Licklider of MIT and Jeff Barnett of SDC, re. augmentation support for the Speech Understanding Project

J.C.R. Licklider is head of the Dynamic Modelling Group in Project Mac at MIT, and also serves for IPT as the Project Coordinator for their multi-contractor Speech Understanding Project. Jeff Barnett is with SDC's part of the Speech Understanding Project. They were here at SRI for a meeting on the Project, with Don Walker's group. 1

Lick wanted to talk seriously to me about the possibility of the Speech Understanding Project making use of DSS (and other of our tools) for their collaborative project work. 2

He understands that there are many problems to overcome, even in translating our known techniques into their working domain, but he also appreciates that the double value (Speech-Project facilitation, and collaborative-dialogue experimentation) needs to be pursued in a planned, proposed and adequately supported manner. Therefore, he would like for us and them to develop a joint plan, and then to be writing Larry a proposal, like in the next two months, so as to be under way in 18 months or so. 2a

We gave some thought to a reasonably elegant target system/activity. Some usage scenarios: 2b

Supplementing their monthly meetings, have firm data recorded. Telephone hookup for conference speaking. Parallel to the telephone conversation, an on-line display for each, with various ways for controlling the views seen;by each, to supplement discussion. "Passing the chalk around" -- i.e. letting them take turns controlling the common display portrayals. 2b1

And, suppose each contractor could keep a Baseline Record that he updated weekly -- containing e.g. long-term goals and limited objectives, and for each of these a task breakdown, the obstacles currently threatening these, what alternatives and options are open, ramifications upon other people's plans and activities, etc. 2b2

E.g., Jeff Barnett would like to depend upon another site's front-end sub-system -- Forgie's, or SRI's; but Forgie would probably want to keep an eye on SRI's (or BBN's or SDC's) semantic-technique progress to support his work. 2b2a

Pressures that exist on each guy toward such cooperation are a mixture of: funding squeeze, e.g. "will I be able over the next few years to get enough

funds to make a whole independent system all by myself;" and competitive performance -- like I should be sure that I get the best Part X to my system or the performance of the system part I really am inteested in and good at won't show up well. 2b2b

Seems that our Baseline Record System (and parts of the Baseline Mangement System) would be aimed at supporting just this sort of facility activity. (Lick sayss he'd like diagramatic representations, etc., but this would also be common to the other applications of BRS.) 2b3

Would expect them to provide the pushing, management, convention setting, etc., within their group, to make things work -- we would provide guidance, manuals, training of their system manager(s) and perhaps PSO types, and maintain and upgrade the NLS service (preferably on a TENEX that is someone elses responsibility to maintain and operate. 2c

How much would it cost for us to support such an activity? I guessed that $15K/mo. would cover computer facility, manpower, from our end safely enough. (Although maybe their loading would be much lighter than this.) 2d

This is based on their having several consoles' worth of service capacity devoted to their use -- which Lick feels is much more capacity than they would need (at least for quite a while). 2d1

Note about expense justification: A summer study group is being planned for summer after next; Lick guessed $50K total cost to support that study, and Larry gasped a bit at that. Lick therefore assumes that $15K/mo would seem too steep just to support the dialogue of the Speech Understanding group. 2d2

He asks me how much lead time to put in a bid for supporting that activity? Damn, I don't have an answer. 2e

We talk about a "Network NLS-service resource service" being established, like in RAND's TENEX. I mention RAND's problems in apparently not beng set up topovide facility-operator service, which would seem to limit severely what coul be counted on there -- but generally this srt of thing, with another outfit maintaining and operating the basic TENEX support system, and ARC maintaining NLS within that, would very much help us be able to meet such service requrements as we are talking about. 2f

Visit log: J.C.R. Licklider of MIT and Jeff Barnett of SDC, re. augmentation support for the Speech Understanding Project

Lick would like for each site to go to the trouble of getting hardware, special software, etc., to do this dialoging. Jeff, at SDC, has a Tektronix (storage-tube display), which would require us to develop the special interactive conventions. 2g

Lick feels that it could be reasonable to go ahead with such a "relatively elegant" proposal, but pitch it as a combination of explicit collaboration support together with exploratory development of the techniques. He would be willing to help develop and promote such a proposal. 2h

Miscellaneous: 3

About a collaborative system that Nat Rochester told Lick about: 3a

Nat is at IBM's Cambridge Cente (second floor of 545 Technology Square, same floor as Lick's Dynamic Modelling Group). A group there is collaborating on a common task with a grou at Poughkeepsie, and they are using terminals and a common computer to facilitate this. Four people at one site, and six at another. They hav individual files, and apparently some common, project files. Lots of interplay in their file communication, including some recorded dialogue apparently. Says they find their inter-group travel to be about half of what it would otherwise be. 3a1

Lick suggests that it might be sensible for IPT to establish a prevailing principle to the effect that evey IPT working committee ought to have a NIC man on board for the express purpose of matching impedances to the type of support that NIC could provide to the committee. 3b

Wrapup: 4

I think that we should be able to develop a proposal for stages of support, of the sort he is aiming for, that would be both useful and of value in guiding mutual evolution (their collaborative methodology and appreciation/need for such service, and for us the stimulation, feedback, BC-like clientele. 4a

He'd like to vist us for a day or so, for tutorial soakup of NLS etc. Tentatively on Feb 1 and/or 2, since he will be in Los Angeles on 3 Feb. 4b

We should count on working at a joint proposal when he is

here. (And ARC certainly has to get going on a plan for marketing our services -- lead time, cost, service partitioning or guarantee, etc.) 4c

DCE 29-DEC-71 19:00 8340

Visit log: J.C.R. Licklider of MIT and Jeff Barnett of SDC, re. augmentation support for the Speech Understanding Project

(J8340) 29-DEC-71 19:00; Title: Author(s): Douglas C. Engelbart/DCE; Distribution: William S. Duvall, Richard W. Watson, James C. Norton, Charles H. Irby/WSD RWW JCN CHI; Sub-Collections: SRI-ARC; Clerk: DCE;

DCE 29-DEC-71 19:39 8341

Phone log: Call to Tom Keenan, NSF, regarding possible ARC proposal for some of their 'dropout' funding

I called him (0850, on 29 Dec) as a followup on the earlier conversations: with him (28 Dec -- 8309,) and with Larry Roberts (later the same day -- 8312,). I told him of Larry's explanation for my being on his "dropout list" (as he called it), and said that if ARC was thus indeed eligible I would be interested in possibly accellerating a proposal to him. I pointed out that I had hoped anyway to be coming around to them sometime during the coming year, to discuss both a general (perhaps trial) picture of the Bootstrap Community plans, and some specific activities therein that they might be interested in supporting; to accelerate it a bit, within a framework that served anyway a mutually useful purpose (helping them invest this "dropout" money), would also serve well to get us acquainted. He agreed, so it is left that I will soon notify him of our intentions with regard to getting them a fast proposal. 1

It is understood that ARC's need for help from these "dropout funds" is not nearly as acute as is the need by other groups that have been partially or totally cut back in their over-all funding level. If we proceed here, it will e with the mutual understanding while we probably are eligible, we would have a relatively low priority. 1a

On timing: He would need a ready-to-go proposal by mid January at least -- they need to obligate all of these funds by March 1. This is by the current decree, from which they might possibly get a reprieve, but which they now have to assume is a fixed date. Their usual procedure of sending proposals out to qualified, external reviewers will likely be short circuited for this batch of proposals. 2

Timing, as far as the timing and rate of expenditure, once it is contracted out, is quite flexible. So if this panned out for us, we wouldn't have to hit it abruptly. He said that, in fact, the activity could wait to start until sometime within FY 73. Under their present schedule, if they meet an internal March 1 deadline, "notice" would be given the contractor on April 1 (whatever that means, with respect to earliest startup time). 2a

They are directed to allocate this money for one-year grants only -- which he mentioned is contrary to what has become their preferred practice of several-year grant periods. 2b

We had perhaps ten minutes dialogue on the nature of the Bootstrap Community, and on a candidate activity that I could picture our proposing. 3

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This money is earmarked for shoring up "fundamental, basic investigations," aand couldn't appropriately be used for service or heavy implementation. Tom pointed this out after I had outlined the collaborative, networking aspects of the Bootstrap Community, where it would seem to NSF's interest to get some of their university, computer-science groups into closer collaboration. (I think that this BC development would be valid enough "basic experimentation" in a domain such as "scientific methodology," but not in the domain of computer science. 3a

In my recent months' thinking about our future plans, there has been one particular possibility that has grown ever more promising as its various aspects have evolved in my head, so I gave it a brief mention to him: it would involve a specific, concentrated effort on programming methodology, aimed toward the general SEAS (Software Engineering Augmentation System) that has already been set forth in our rough plans -- see our next-period IPT proposal (7404,), and its SEAS appendix (7409,). 3b

He felt that this could be quite acceptable as a topic (depending, of course, upon the particular goals and approach proposed). 3b1

He told me that they (NSF, Computer Science) are very much interested in fostering the growth of principles, methods, etc. in the software area; for instance, they are supporting development of special language development for writing operating systems. He hopes they will be able to get people to publish abstractions of principles, so that a meaningful professional dialogue can help in evolving the discipline. He suspects that the very rapid development of "computer science" in the last fifteen years has caused this discipline to suffer unduly from the time lag in what appears to him to be the only effective way that research ideas get out into practice -- i.e. by graduate students going out and becoming part of the practicing community. He feels that this is at least partly responsible for the 5- to 8-year lag between practices in the field and in the research universities. 3c

All of this is very stimulating to hear, from its high relevancy to the BC goals and plans. 3c1

Regarding financial quirks in NSF contracting practices. 4

NSF specializes in university research grsnts, from which stems a set of policies that to SRI are both peculiar and

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awkward. They call it "cost sharing" (with the contractor), and it amounts to their not paying all of what it costs SRI to do the contracted work within a (Government-regulated) accounting framework that barely allows SRI anyway to survive. This factor will affect our end decision as to whether or not to submit a proposal. 4a

It used to be that there was a way in which resources from a non-government sponsor could be coordinated with NSF's grant so that in fact they were sort of "co-sponsors", and SRI could come out even. In light of the plans and prospects which we anyway have in our BC thinking, for developing participation by non-government groups, this "co-sponsorship possibility" is an important one to explore. Keenan didn't know if this was still possible. 4b

DCE 29-DEC-71 19:39 8341

Phone log: Call to Tom Keenan, NSF, regarding possible ARC proposal for some of their 'dropout' funding

(J8341) 29-DEC-71 19:39; Title: Author(s): Douglas C. Engelbart/DCE; Distribution: James C. Norton, Richard W. Watson, Ed K. Van De Riet, Charles H. Irby, Walter L. Bass, William S. Duvall, Bruce L. Parsley, William H. Paxton/JCN RWW EKV CHI WLB WSD BLP WHP; Sub-Collections: SRI-ARC; Clerk: DCE;

RWW 29-DEC-71 20:38 8342

conversation with steve crocker 28 dec 71

i had a conversation with steve crocker and the following topics were discussed 1

steve said he was getting to like nls more and more as he learned how to use it. 1a

he thought our uptime was really poor. 1b

butler lampson of xerox was in talking about their proposal and the topic of graphics in nls came up. arpa seems to want it badly but butler said it won't happen in their system unless it came from us. 1c

i mentioned our desire to put in graphics and the foundation work going on now to implement a new nls basic file system and our feeling that we needed a good hardcopy capability preferrably such as an fr-80. steve said he was not convinced such high quality was needed and that a gould would do, but that they were open to further discussions on funding for some kind of device for graphics. 1c1

we talked a little bit about the future of nic and he said that as they move along toward setting up the network operating company they would keep in close touch with us. i mentioned some of the possibilities for nic
transfer to the noc
working with noc within sri
an indedendent entity within sri
an independent entity outside of sri 1d

his initial reaction for what ever its worth was more favorable toward the independent entity outside of sri 1e

he felt there were a related set of issues arpa needed to come to grips with
establishing a utility
future hardware developments
future protocol and other software developments
nwg function and form
directory and brokering services 1f

he also wanted to know how we felt about nic service to people on the net who were not developing computer science things such as social scientists etc. i told him we were developing a plan for nic's future now which would one way or another come to grips with such issues and we would talk to arpa when it firmed up to see how that might fit into their plans etc. 1g

RWW 29-DEC-71 20:38 8342

conversation with steve crocker 28 dec 71

(J8342) 29-DEC-71 20:38; Title: Author(s): Richard W. Watson/RWW; Distribution: Douglas C. Engelbart, James C. Norton, Charles H. Irby, Ed K. Van De Riet/DCE JCN CHI EKV; Sub-Collections: SRI-ARC; Clerk: RWW;

JBL 30-DEC-71 9:07 8343

Requesting repeat from RWW

Dick: I got yesterday a message that's probably been floating around in the system for a while--I was having trouble with on-line delivery. Here is what I got. 1

RWW 21-DEC-71 9:36 8292
Correction to Note to JBL
Message: Joel, I miss typed one of the numbers yesterdaaay.
The numbers should haave been (6912,) and (6978,) and (7215,). 1a

Could you please repeat the message referred to?
Thanx-----Joel 2

JBL 30-DEC-71 9:07 8343

Requesting repeat from RWW

(J8343) 30-DEC-71 9:07; Title: Author(s): Joel B. Levin/JBL;
Distribution: Richard W. Watson/RWW; Sub-Collections: NIC; Clerk: JBL;

RST 30-DEC-71 10:02 8344

nls gripes and bugs

John:
Thought I would try out this random Journal system. Perhaps you're not the right person to field NLS bugs etc. but you can pass these on and let me know who the right person is. 1

Negative left margins don't seem to work. The output processor goes into a loop typing semi-infinite spaces which cannot be interrupted by rubout. 1a

I'm getting somewhat desperate for a reasonable way to transfer a pretty sequential version of an NLS file over the network. I've tried diverting my terminal output to a file, but padding and lack of proper length pages requires too much post processing before I can list it here. 1b

The restrictions your system make on network users seems a little over-paranoid. I would certainly like to do a QFD and a COPY to TTY: without having to enable all the time. 1c

RST 30-DEC-71 10:02 8344

nls gripes and bugs

(J8344) 30-DEC-71 10:02; Title: Author(s): Ray S. Tomlinson/RST;
Distribution: Ray S. Tomlinson/RST; Sub-Collections: NIC; Clerk: RST;

RST 30-DEC-71 10:08 8345

nls gripes and bugs

John:
Thought I would try out this random Journal system. Perhaps you're not the right person to field NLS bugs etc. but you can pass these on and let me know who the right person is. 1

Negative left margins don't seem to work. The output processor goes into a loop typing semi-infinite spaces which cannot be interrupted by rubout. 1a

I'm getting somewhat desperate for a reasonable way to transfer a pretty sequential version of an NLS file over the network. I've tried diverting my terminal output to a file, but padding and lack of proper length pages requires too much post processing before I can list it here. 1b

The restrictions your system make on network users seems a little over-paranoid. I would certainly like to do a QFD and a COPY to TTY: without having to enable all the time. 1c

RST 30-DEC-71 10:08 8345

nls gripes and bugs

(J8345) 30-DEC-71 10:08; Title: Author(s): Ray S. Tomlinson/RST; Distribution: John T. Melvin, Ray S. Tomlinson/JTM RST; Sub-Collections: NIC; Clerk: RST;

TECHNICAL SUPPORT FOR RADC USE OF AUGMENTATION TECHNOLOGY
Part One--Technical Proposal 1

I INTRODUCTION 2

A. General 2a

This proposal is in response to Rome Air Development Center Request for Proposal No. jjkjkjkjkiu 2a1

A brief description of the Center and its developments is presented below. 2a1a

B. The Augmentation Research Center 2b

The ARC is a community of researchers, supported by several different contracts, in which the research activity is aimed at exploring the possibilities for augmenting individuals and groups in the performance of intellectual work with the help of real-time computer aids and the actual experimental development of computer aids and augmentation systems. 2b1

The researchers within ARC do as much of their work as possible at display consoles (depending on console availability and whether a specific task can appropriately be done at a console). Thus they serve not only as researchers but as the subjects for the analysis and evaluation of the augmentation systems that they are developing. 2b2

Consequently, an important aspect of the augmentation work done within the ARC is that the techniques being explored are implemented, studied, and evaluated with the advantage of intensive everyday usage within a coordinated working environment that is compatible with the particular techniques being studied. 2b3

C. Organization of this Proposal 2c

This proposal is divided into two parts, each of which is broken down into several sections. 2c1

Part One is the Technical Proposal, covering the proposed work and its background and context. 2c1a

Section I is the introduction. 2c1a1

Section II is a discussion of proposed project activity. 2c1a2

Section III is a summary outline of proposed project activity. 2c1a3

Part Two is the Business Proposal, concerned with proposed contractual provisions, with sections covering such topics as estimated time and charges, reports, contract form, acceptance period, and a cost estimate with supporting schedules. 2c1b

II DISCUSSION OF PROPOSED PROJECT ACTIVITY

3

A. Objective

3a

The objective of this effort is to work with RADC technical and other personnel in the mutual development of procedures, methodology, software packages, and other computer tools, and in the training of RADC people that will allow their exploratory use of Augmentation technology within RADC.

3a1

B. Background

3b

The Augmentation Research Center has developed, over a period of years under Government sponsorship, a general-purpose interactive augmentation system. The goal of this work has been to develop a prototype system that will aid in significantly improving the performance of individuals and teams engaged in intellectual activities through daily use of the tools, procedures, methodologies, and languages.

3b1

The technology has a potential of improving job performance in other working environments. As integration of augmentation techniques into such other environments is being considered, questions need to be be investigated regarding specific design features, the extent of anticipated improvement in users' effectiveness, and cost.

3b2

To investigate these questions, it appears useful for the technology, as currently developed, to be used by a limited but significant number of RADC people, performing necessary and varied tasks, over an extended period of time.

3b2a

These people must be trained to different levels of competence in the use of the system, depending upon the nature of their jobs and the tasks they perform. In addition, new procedures and methods must be developed to allow effective use of the system in the RADC working environment.

3b2b

To this end, ARC will do the following:

3b3

Assist RADC in training RADC users to make special

utilization of the system for features that are peculiar to the RADC environment. 3b3a

Assist RADC in developing baseline management procedures, records, and methods. 3b3b

Provide the necessary computer time, file privacy, and access to system software packages. 3b3c

Assist RADC in preparing for a controlled evaluation effort planned by RADC during the next fiscal year. 3b3d

III SUMMARY OF PROPOSED PROJECT ACTIVITY 4

The proposed project work will include: 4a

Providing engineering assistance to permit RADC access to the full capability of ARC's on-line system (NLS) and its related user programming features (as appropriate) via the ARPA Computer Network from 0800 to 1700 Eastern Standard Time Monday through Friday. 4a1

The availability of the ARC system for RADC use during these hours will conform to the regular schedule of service maintained by ARC for Network users in general. For instance, the system is not currently available for Network use during the 0300 to 0400 EST period due to ARC use for system work such as compiling and loading of new system programs. 4a1a

We plan to provide sufficient file space, identification passwords, and other system resources to accommodate up to 12 RADC users. 4a1b

We expect that no more than 4 RADC users will simultaneously use the ARC NLS system during the proposed contract period. RADC users will be expected to work within the same operational and load balancing constraints as other Network users of the system. 4a1b1

We will provide the necessary software and/or procedures to ensure some privacy of file access. It should be noted on the other hand, that the visibility and availability of planning information

and other recorded dialog in the ARC Journal system provides some of the most significant effectiveness-augmenting potential of our augmentation system. 4a1b2

We understand that ARC personnel may enter and read RADC files; however, other individuals accessing ARC service via the ARPA Network will be denied read and write access to RADC files, unless RADC personnel specifically release files for general Network use. 4a1b3

Providing training as appropriate in the use of DNLS, TNLS, Deferred Execution, Analyzer-Formatter, Collector-Sorter, Calculation, and Graphics software packages. 4a2

Providing engineering assistance to RADC personnel in the formulation, development, and implementation of a project baseline management system within the Information Processing Branch at RADC. 4a3

This will include assistance in the development of: management strategies suitable to the RADC environment, procedures within the RADC organization and NLS for implementing these strategies, programs to handle the mechanics of RADC baseline management system, and evaluation methodologies. 4a3a

We also anticipate providing some assistance to RADC in studying other Air Force application needs and possibilities and in formulating a general approach to Air Force assessment and possible evolutionary incorporation of augmentation techniques. 4a4

As stated in the Proposal Request, we anticipate that approximately 20% of the effort may be conducted at RADC. The actual proportion of such work will be determined by RADC and ARC technical personnel during the course of the work. 4a5

IV SELECTED PUBLICATIONS

5

1. ARC 3906, D. C. Engelbart, "Augmenting Human Intellect: A Conceptual Framework," Summary Report, Contract AF

49(638)-1024, SRI Project 3578, Stanford Research Institute, Menlo Park, California, AD 289 565, October 1962. 5a

2. ARC 5139, D. C. Engelbart and Staff of Augmentation Research Center, "Computer-Augmented Management-System Research and Development of Augmentation Facility," RADC-TR-82, Final Report of Contract F30602-68-C-0286, SRI Project 7101, Stanford Research Institute, Menlo Park, California, April 1970. 5b

3. ARC 5140, D. C. Engelbart and Staff of Augmentation Research Center, "Advanced Intellect-Augmentation Techniques," Final Report NASA Contract NAS1-7897, SRI Project 7079, Stanford Research Institute, Menlo Park, California, July 1970. 5c

4. ARC 5255, D. C. Engelbart, "Intellectual Implications of Multi-Access Computer Networks," paper presented at the Interdisciplinary Conference on Multiple-Access Computer Networks, Austin, Texas, April 20-22, 1970. 5d

5. ARC 8276, D. C. Engelbart, "Experimental Development of a Small Computer-Augmented Information System," Annual Report, Office of Naval Research (ONR) Contract N00014-70-C-0302, SRI Project 8622, Stanford Research Institute, Menlo Park, California, April 1971. 5e

6. ARC 8277, D. C. Engelbart and Staff of Augmentation Research Center, "Network Information Center and Computer-Augmented Team Interaction," Interim Report, Air Force (RADC) Contract F30602-70-C-0219, SRI Project 8457, Stanford Research Institute, Menlo Park, California, July 1971. 5f

TECHNICAL SUPPORT FOR RADC USE OF AUGMENTATION TECHNOLOGY
Part Two--Business Proposal 6

I ESTIMATED TIME AND CHARGES 7

It is proposed that the work outlined herein be performed during a period of 8 months. 7a

The level of effort is proposed at 3,262 hours over the 8 month period. This level appears more appropriate for the effort over the period proposed than the 4000 hour level outlined in the Proposal Request. 7a1

Documentation will be provided in accordance with the schedule shown in Section III, Reports, below. 7b

Pursuant to the provisions of ASPR 16-206.2, attached is a cost estimate and support schedule in lieu of the DD Form 633-4. Also enclosed is a signed form complete except as to the "Detail Description of Cost Elements." 7c

II GOVERNMENT-FURNISHED EQUIPMENT 8

The performance of the proposed work will involve the use of government-furnished equipment covered by Air Force (RADC) Contract No. F30602-70-C-0219. 8a

III REPORTS 9

Because of the support nature of the efforts proposed herein, there will be no technical reports produced under this contract. Rather, documentation will be provided along the lines outlined in the Proposal Request Statement of Work in Paragraph 5.0 entitled "Data." 9a

The technical documentation will include: 9a1

Item	Delivery	Title	
			9a1a
(A003)	30 Days AC:	TNLS and Deferred Execution Users Guides	9a1b
(A004)	30 Days AC:	L-10 Programming Guide	9a1c
(A005)	4 Mo. AC:	Analyzer-Formatter, Collector	

Sorter, and Calculator User Guides 9a1d

(A006) 4 Mo. AC: DNLS-IMLAC User Guide 9a1e

IV CONTRACT FORM 10

Due to the nature of the work proposed, it is requested that any contract resulting from this proposal be awarded on a cost-plus-fixed-fee basis rather than on the firm-fixed-price (term) basis requested in the Proposal Request. 10a

V ACCEPTANCE PERIOD 11

This proposal will remain in effect until 1 March 1972. If consideration of the proposal requires a longer period, the Institute will be glad to consider a request for an extension of time. 11a

Cost Estimate:

COST ESTIMATE

Personnel Costs			
Proj Supv	50 hrs.		
Senior Prof	100 hrs.		
Prof	2,500 hrs.		
Clerical	612 hrs.		
Total Direct Labor			$ 23,174
Payroll Burden @ 28% *			6,489
Total Labor and Burden			29,663
Overhead @ 105% *			31,146
Total Personnel Costs			60,809
Direct Costs			
Travel			7,725
15 trips East @ $310 =		$ 4,650	
75 Days Subsistence @ $31 =		2,325	
Auto Rental 50 days @ $15 =		750	
Communications			500
Documentation Costs			419
Total Direct Costs			8,644
Total Estimated Cost			69,453
Fixed Fee			5,557
Total Estimated Cost Plus Fixed Fee			$ 75,010

* See following schedules

Cost Schedules:

SCHEDULE A

DIRECT LABOR

Direct labor charges are based on the actual salaries for the staff members contemplated for the project work plus a judgmental factor applied to base salary for merit increases during the contract period of performance. Frequency of salary reviews and level of merit increases are in accordance with the Institute's Salary and Wage Payment Policy as published in Topic No. 505 of the SRI Administration Manual and as approved by the Defense Contract Administration Services Region.

SCHEDULE B

OVERHEAD AND PAYROLL BURDEN

By letter agreement of 21 May 1971 with the Tri-Service Overhead Negotiations Committee, the Institute negotiated the following rates as acceptable for current bidding and billing purposes:

	1972 Billing/Bidding Rates
On-Site Overhead	105%
Off-Site Overhead	75%

The Payroll Burden rate of 28% is based on the Institute's best estimate of 1972 costs.

Rather than setting forth these specific rates, it is requested that contracts provide for reimbursement at billing rates acceptable to the Contracting Officer, subject to retroactive adjustment to fixed rates negotiated on the basis of historical cost data. Included in payroll burden are such costs as vacation, holiday, and sick leave pay, social security taxes, and contributions to employee benefit plans.

SCHEDULE C

TRAVEL COSTS

Air fare is based on prices for travel to Rome, New York, at $310 round-trip tourist established in the Official Airline Guide dated December 1, 1971.

Domestic subsistence rates and travel by private automobile are established standards based on cost data submitted to and approved by DCAA.

SCHEDULE D

DOCUMENTATION COSTS

Documentation costs are estimated on the basis of the number of pages of text and illustrations and the number of copies to be produced:

The following is a breakdown of the estimated cost of reproduction:

TNLS Guide @ 120 pages, 12 copies @ .05/page=	$ 72
DEX Guide @ 100 pages, 12 copies @ .05/page=	$ 60
L-10 Guide @ 100 pages, 5 copies @ .05/page=	$ 25
AF,CS,Calc Guides @ 50 pages, 5 copies @ .05/page=	$ 12
DNLS Guide @ 200 pages, 5 copies @ .05/page=	$ 50
Mailing costs:	$ 200
Total:	$ 419

&SRI-ARC JCN 14-JAN-72 14:14 8347
Technical Support for RADC Use of Augmentation Technology, SRI
Proposal ISU 72-7
Proposal for Research No. ISU-72-7

(J8347) 14-JAN-72 14:14; Title: Author(s): S.R.I. - Augmentation Research Center, James C. Norton/&SRI-ARC JCN; Distribution: Duane L. Stone/DLS; Sub-Collections: SRI-ARC; Clerk: JCN;
Origin: <NORTON>J8347.NLS;6, 12-JAN-72 11:57 JCN ;
.RTJ=0; =" P=2; SRI-ARC 3 FEB 72 8347";

DCE 30-DEC-71 18:21 8349

To WSD about Journal System NP

Bill: As I begin to settle into my new mode of work, I've turned again to using the Journal. I have some specific questions and suggestions to communicate to you about its current operations, plus notifying you of a "letter form" that Bo and Walt and I worked out (see -- nnnn,). 1

COMMENT-PRINTOUT ARRANGEMENT 2

Page numbering seems to be amiss, and the culprit seems to be the "PGN=-1;" directive installed in the source statement, assuming (I guess) that an extra comment page will be printed following a page for source-statement only, and preceding the first page of text. I assume that, for such a way of dealing with comment printout, you would need to find a way to conditionally set this directive's value to be 0 when there is no comment and -1 when there is one. 2a

But, we ran into trouble with the problem of this separate comment page, where we wanted a header arrangement for the first text page different from that of the succeeding pages. We solved our problem with the temporary expediency of a convention that there would be no comments associated with letters that we entered into the Journal; we assume then that the first page following the source-statement printout (the one where first a header would appear) is the first text page of the letter, and so that any first-page-only header printed there can switch itself off and switch on any following-page headers. We also put into that once-only header a "PGN=1;" to get our page numbering right. 2b

If you fixed up the page numbering so that the first text page was uniformily numbered "1", then we could put header-switch directives in the headers themselves that were page-number conditional and would change the header-print configuration on the first page of the letter, whether or not this is the first text page of the printout. 2b1

Perhaps my assumption is wrong about how comments are printed out (i.e. that you have them coming out on Page 0, following the source-statement page and preceding the first page of file-text printout), but I would like to see what you think of printing them instead on the same page as the file source statement. A "GCR=10;" directive, for instance, could position the comment passage down the page for good visual separation from the rest of the source statement; and I wouldn't think that anybody would object to having his comments delivered that way. I would prefer it myself, to keep from having two file-relevant-data printout pages. 2c

RIGHT MARGIN SETTING FOR JHEADER 3

I propose that this be set to the same value as is the SNF directive, so that these two numbers (Journal number and statement-location number) which are part of the same referencing scheme will be printed in the same columnar alignement. I think that it improves the page-layout appearane, too. 3a

RIGHT-JUSTIFIED PAGE NUMBERING 4

It isn't important yet, from the way we depend upon page numbers, to give much concern to where they are positioned. But whenever one us looking for a page number, when scanning through a bound report or a looseleaf notebook, it seems obvious to me that they would serve better if printed over at the right margin. 4a

Journal-number, page-number referencing being an alternate to Jounal-number, location-number referencing, the page numbers have a similar right and need to be columnwise associated with the Journal number, too. But, we must avoid possible confusion in a reader's quick-look interpretation of an integer appearing at the right margin -- assuming that such could be either a Journal number, a location number, or a page number. 4a1

The Journal Number being safely above three digits now gives it uniqueness in tha feature alone, which is further bolstered by the date and author-initials being printed with it in a close string, and by conventionally being at the very top of the page. 4a2

The page number would also be uniquely positionad at the bottom of the right-margin column, but it wouldn't have the same number-size uniqeness to guard anyway against being mistaken for a location number. Printing something like "Page 2" instead of just the page number "2" would seem called for, and would neatly and completely remove any quick-glance ambiguity. 4a3

I would like for us to consider changing page numbers now to a right-margin, "Page n" form, in our standard Journal-printout format. Even though the payoff (plus or minus) seems trivial in our current environment, I think that it is sensible practice for the "inevitable other aspects" of page-layout evolution over the months ahead to be done with page numbers being printed where and how we best-guess they ultimately should be. 4b

HARD-COPY JOURNAL-REFERENCE PRINTOUTS 5

I find a real need to have a reliable access to random Journal items. I understand that there has been a long sequence of problems in keeping up on the operational aspects of the Journal system, and I assume that now there is a rather overwhelming backlog of printout work. 5a

I realize that, at any point in our DSS/Journal development, we must deal with complicated tradeoffs among such factors as: 5b

How many "permanent, reference" copies of Journal printouts to keep; 5b1

Where to keep them; 5b2

How to organize each such collection (e.g. by number, by author, by subject and relevance (Handbook, Baseline Record), etc., including retired-obsolete items; 5b3

How to index these different collections; 5b4

How to provide target sendees with hard copy (automatic, only if sendor specifically specifies, only if sendee requests, ...); 5b5

How to provide for subsequent "reprint" requests (from ARC, NIC, or others). 5b6

How to balance between responsiveness, cost, computer-resource loading, PSO complication, etc., as between such possibilites as: 5b7

Print all on the (a) printer, 5b7a

Keep the print files so that random-item printout doesn't require a separate pass of the Output Processor. 5b7b

Print one master copy for Xeroxing, and one for say lithographic reproduction, and make all other printouts from these with the appropriate reproduction method. 5b7c

Bulk reproduce in batches to maintain an inventory from which first-print and subsequent random-request needs are filled (with attendant new problems, such as dollars being tied up in inventory, wastage when overestimate demand, inventory control, etc.). 5b7d

I understand that quite soon we will be getting our own

copying machine, so that we can depend upon that for a next stage of hard-copy production. 5c

As an interim measure toward filling the basic need for hard-copy referencing, before we find a nice solution to the above facets, and before we get rolling with reliable systems and adequate PSO capacity, I would like to have you consider pushing for the near-future updating of at least the two reference collections I know of (mine, and the red commons-room notebooks). 5d

It wouldn't seem too bad to stop delivering hard copy to sendees until we get more support capacity -- only do as automatic the updating of specified reference collections. 5d1

A LETTER-FORM CONVENTION 6

Bo and Walter and I have evolved a special layout of headers and directives such that we can prepare our outgoing corresspondence into the Journal, and their printout from the Journal form produces a nicely laid out letter format. 6a

Senders address, recipient's address, and the salutation parts are all included as headers that are printed only on the first page;, and the final sign-off section is a single statement containing an SNF=0 directive to turn off printout of its location number. Thus, only the text part of the letter has left-margin referencing location numbers, and these begin with 1 for the first paragraph of the letter's text -- which I feel seems desireable. 6b

For some examples of letters so formatted, see (8316,) (8326,) (8327,) (8328,) (8329,) (8330,) (8332,) (8333,) I have made a form for this (see -- Engelbart, letterform,) which we can make available to our secretaries for preparing our letters. I'd like for you to give a bit of study to these examples and the form that created; then would you please offer any comments to Walter (technical) or me (principle) that you might have about better ways for integrating our outgoing corresspondence into the Journal system. 6c

ANOTHER OPTION FOR MODE OF JOURNAL ENTRY 7

I find that it often takes me an annoyingly long time to execute journal entries. Mistakes, etc. Also, if I get something prepared, but can't enter it at the time because I don't have time, or the Journal system isn't behaving well, then I have to rethink questions of title, distribution, etc. for entering it later. 7a

I'd like to see us provide at least the following sort of trial alternative. 7b

Allow a Journal-entry mode whereby the user specifies a branch in a file and the rest is automatic. The sub plex contain the material that he wants to enter, and the source statement is specially formatted to provide the entry data, such as title and distribution ident(s). Let the user get a "status" report that would include syntax errors. If he wants to correct something or change his mind, he reverts to NLS text editing of that source statement, rather than retyping. A person would probably keep himself furnished with some standard entry-statement forms. 7c

DCE 30-DEC-71 18:21 8349

To WSD about Journal System NP

(J8349) 30-DEC-71 18:21; Title: Author(s): Douglas C. Engelbart/DCE;
Distribution: William S. Duvall, Walter L. Bass, James C. Norton,
Charles H. Irby, Beauregard A. Hardeman/WSD WLB JCN CHI BAH;
Sub-Collections: SRI-ARC; Clerk: DCE;

TNP 30-DEC-71 19:40 8350

REPLY TO YOUR MAILED NOTE DATED 28 DEC 71

NBS EMERGENCY CONTACT SHOULD BE MR. DON E. RIPPY,
(301) 921-2601)
NBS MODEMS ARE NOW 9 -- 103A'S...WAITING FORE THE REMAINING
CARD MODEMS.
EVERYTHING ELSE OK IN YOUR NOTE OF CIRCUITS FILE DATED 28 DEC.
SORRY I HAVNT REPLIED TO YOUR CORRECTION REQUEST FOR PREVIOUS
VERSION OF CIRCUITS FILE LISTING, BUT HAVE BEEN WAITING TO
USE THE NIC.

1

TNP 30-DEC-71 19:40 8350

REPLY TO YOUR MAILED NOTE DATED 28 DEC 71

(J8350) 30-DEC-71 19:40; Title: Author(s): Thomas N. Pyke/TNP; Distribution: Bruce A. Dolan/BAD; Sub-Collections: NIC; Clerk: TNP;

TNP 30-DEC-71 19:46 8351

FIRST MESSAGE TO SIG

NIC MODIFIED THIS AM (12/31) TO ACCEPT USERS THROUGH NBS TIP.
PLEASE ACKNOLEDGE BY RETURN MSG THRU JOURNAL THAT YOU HAVE
NIC ACCESS ON REGULAR BASIS. WHEN I NOTE A RETURN MESSAGE,
WE CAN BEGIN OUR COOPERATIVE EXPERIMENT....THIS IS A FINE
WAY TO BEGIN THE NEW YEAR. 1

TNP 30-DEC-71 19:46 8351

FIRST MESSAGE TO SIG

(J8351) 30-DEC-71 19:46; Title: Author(s): Thomas N. Pyke/TNP;
Distribution: Siegfried Treu/ST; Sub-Collections: NIC; Clerk: TNP;

TNP 30-DEC-71 19:50 8352

THANK YOU

THANK YOU FOR YOUR HELP. NIC NOW ACCESSIBLE THROUGH
BOTH NBS TIP AND OUR PDP-11. WE ARE LOOKING FORWARD
TO VERY PRODUCTIVE AND REWARDING USE OF YOUR SYSTEM

1

TNP 30-DEC-71 19:50 8352

THANK YOU

(J8352) 30-DEC-71 19:50; Title: Author(s): Thomas N. Pyke/TNP;
Distribution: John T. Melvin, Richard W. Watson/JTM(THANKS) RWW(THANKS);
Sub-Collections: NIC; Clerk: TNP;

JBP 2-JAN-72 14:10 8353

RJS Comments

Alex:

I received your draft of the RJS Protocol on tthhee 30th on first reading it looks ok. I wwillll sseenndd mmoorreee ddeeeffiiinnnaattee cccoommmmeennnttsssss oonnnnnn mmoonnnnddaaaayyyyy . I would like to send a copy to Ken Bowles at UCSD if its ok with you. UCSD is primarialy trying to get RJE type business for their b6700. i will probably be visiting them in the next two weeks. -- jon 1

JBP 2-JAN-72 14:10 8353

RJS Comments

(J8353) 2-JAN-72 14:10; Title: Author(s): Jon B. Postel/JBP;
Distribution: Alex A. McKenzie/AAM; Sub-Collections: NIC; Clerk: JBP;

NWG/RFC# 295 JBP 2-JAN-72 15:35 8355
Protocol Workshop Report

This is a much belated report on the protocol workshop held in conjunction with the NWG meeting in Boston last October.

Report of the Protocol Workshop 1

12 October, 1971 1a

By Jon Postel. 1b

Introduction 2

This is a report on the decisions reached at the protocol workshop held in conjunction with the Network Working Group meeting held in Cambridge from 10 to 14 October, 1971. 2a

The workshop addressed itself to protocols of four types: IMP-Host, Host-Host, Initial Connection, and Process-Process. 2b

IMP-Host Protocol 3

The idea of IMP provided status reports to be exchanged via new IMP-Host protocol messages was discussed and rejected because it was felt that the level of state information which could be reported was not sufficient to be worth the trouble of implementing this mechanism. 3a

Host-Host Protocol 4

The Host-Host Protocol was discussed and several problems were brought to light, among them were the following listed together with the group's recomendations. 4a

The GVB - RET mechanism may prove useful sometime in the future so it will be retained though no one appears to be using it now, however spontaneous RET commands are explicitly prohibited. 4a1

The ECO - ERP commands are useful and should be supported, but spontaneous ERP commmands are explicitly prohibited. A further restriction is that a second ECO will not be sent until the first ECO has been answered. Note that any of the following may be an answer to an ECO: ERP, RST, "Destination dead", or "Incomplete transmission". 4a2

The RST - RRP commands are useful, but the proper use of these commands for determining the status of host software is still open for discussion (please direct comments to Jon Postel), however spontaneous RRP commands are explicitly prohibited. 4a3

The problem of unmatched CLS commands was discussed and four "solutions" were proposed: 4a4

Hold forever 4a4a

Send a RST and clear the entry 4a4b

Clear the entry and possibly mess up a future connection 4a4c

Assign socket numbers in a sequential fashion to reduce the possibility of confussion and clear the entry 4a4d

Note that the first two suggestions follow the protocol while the last two do not. 4a5

The idea of flow control on the control link was suggested. A Request for Comments is to be prepared exploring this idea more fully. 4a6

The usefullness of the ERR command is compromised if the receiver mearly throws it away. Thus ERR's are to be logged, if at all possible, and checked out with the sending site. 4a7

The NCP document should make clear the implicatinns of queueing or not queueing STR & RTS commands. 4a8

Initial Connection Protocol 5

The Initial Connection Protocol (ICP) was discussed and found to be satisfactory however the following points were stressed: 5a

The socket number sent by the logger (S) must be in agreement with the socket numbers used in the STR & RTS sent by the logger. 5a1

The implications of queueing or not queuing of RTS & STR commands should be made clear in the ICP document. This is particularlly important if the user chooses the "listen" option. 5a2

Telnet Protocol 6

The Telnet commmittee has been reactivated to consider the following problems: 6a

Clarification of the terminology half duplex, full duplex, character mode, line mode, ASCII, and echoing. 6a1

Clarification of the end of line convention. Especially to answer the question "Should there be a special end-of-line character?". 6a2

Clarification of the conditions for leaving Hide-your-input mode. 6a3

Clarification of the operation of Break and Synch. 6a4

Specification of a server-to-user Synch. 6a5

Clarification of the definition of the Network Virtual Terminal. 6a6

Preperation of a new document defining the Telnet protocol with the above improvements. 6a7

The protocol workshop did agree that: 6b

It is the servers option for disconnection to imply logout or not. 6b1

It is the servers option for logout to imply disconnection or not. 6b2

Extra characters used locally to fill the time for format effectors to take effect should not be sent over the network. 6b3

Synch means to examine the data stream from the current point to a data mark (x'80'). If any break type characters (e.g. etx, sub, Break) are found they are to have their normal effect. 6b4

Upper and lower case are to be available to all Telnet users. 6b5

Data and File Transfer Protocol 7

The Data and File Transfer Committee will report separately. 7a

NWG/RFC# 295 JBP 2-JAN-72 15:35 8355
Protocol Workshop Report

(J8355) 2-JAN-72 15:35; Title: Author(s): Jon B. Postel/JBP;
Distribution: Steve D. Crocker, Thomas F. Lawrence, John W. McConnell,
John F. Heafner, Robert E. Long, Ari O. J. Ollikainen, James E. White,
A. Wayne Hathaway, Dan L. Murphy, Patrick W. Foulk, Richard A. Winter,
Harold R. Van Zoeren, Alex A. McKenzie, Robert L. Sundberg, James M.
Madden, Joel M. Winett, Abhay K. Bhushan, Peggy M. Karp, Thomas N. Pyke,
Abe S. Landsberg, B. Michael Wilber, James A. Moorer, Edward A.
Feigenbaum, Robert T. Braden, James M. Pepin, Barry D. Wessler, John T.
Melvin, John C. LeGates, Art J. Bernstein, C. D. Shepard, Robert F.
Hargraves/NWG; Keywords: NWG Protocol NCP Telnet ARPANET Network;
Sub-Collections: NWG NIC; RFC# 295; Clerk: JBP;
Origin: <UCLA-7>NWG-MEMO.NLS;20, 2-JAN-72 15:20 JBP ;

RST 3-JAN-72 7:20 8356

Journal Questions

John:
Does on-line journal distribution require special information in someplace like the identfile or can I not send things to myself. 1

I sent my last message to both you and myself and see that you received it, but I didn't. This may also explain why I have received no reply. 2

RST 3-JAN-72 7:20 8356

Journal Questions

(J8356) 3-JAN-72 7:20; Title: Author(s): Ray S. Tomlinson/RST;
Distribution: John T. Melvin/JTM; Sub-Collections: NIC; Clerk: RST;

RWW 3-JAN-72 8:28 8357

Clarification for JBL

Joel, that message 8292 referred too was a reply to a request of yours for information on the output processor. Those numbers were journal items giving descriptions of the many many op commands. You can, or should, be able to read them online. 1

RWW 3-JAN-72 8:28 8357

Clarification for JBL

(J8357) 3-JAN-72 8:28; Title: Author(s): Richard W. Watson/RWW;
Distribution: Joel B. Levin/JBL; Sub-Collections: SRI-ARC; Clerk: RWW;

HGL 3-JAN-72 10:05 8358

MY STATUS IS APPARENT TO ALL

I have put as many of the changes in which I have participated recently in the file (nls,status,). I have also suggested that this be a normal practice for all bug fixing and major design changes. 1

HGL 3-JAN-72 10:05 8358

MY STATUS IS APPARENT TO ALL

(J8358) 3-JAN-72 10:05; Title: Author(s): Harvey G. Lehtman/HGL; Distribution: Marilyn F. Auerbach/MFA; Sub-Collections: SRI-ARC; Clerk: HGL;

LIGHTS AT THE ENDS OF TUNNELS -- MAKING OUR STATUS CRYSTAL CLEAR

We should all put a note in the file (nls,status,) whenever we make changes in the system or fix any bugs. Even I have started to do this 1

HGL 3-JAN-72 10:21 8359

LIGHTS AT THE ENDS OF TUNNELS -- MAKING OUR STATUS CRYSTAL CLEAR

(J8359) 3-JAN-72 10:21; Title: Author(s): Harvey G. Lehtman/HGL; Distribution: Walter L. Bass, William S. Duvall, Mary S. Church, J. D. Hopper, Charles H. Irby, Harvey G. Lehtman, John T. Melvin, Bruce L. Parsley, William H. Paxton/NPG; Sub-Collections: SRI-ARC NPG; Clerk: HGL;