RLL 14-JAN-75 15:50 25106

Wrong title for (25071,): Should be NAVSEC contact report.

Journal item (25071,) was mistakenly titled as NAVCOSSACT contact report. It is in fact the NAVSEC report. The NAVCOSSACT item is (25102,). Robert

1

RLL 14-JAN-75 15:50 25106

Wrong title for (25071,): Should be NAVSEC contact report.

(J25106) 14-JAN-75 15:50;;;; Title: Author(s): Robert N. Lieberman/RLL; Distribution: /JCN([INFO-ONLY]) DCE([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: RLL;

JCN 14-JAN-75 15:54 25107

Draft Statement of Workshop Utility Activity for C.A.Anderson's Use

The research and development activities of the Augmentation Research Center (ARC) are aimed at exploring the possibilities for augmenting individuals and groups in the performance of knowledge work with the help of advanced computer aids and newly developing methods for their use. Exploratory development and operation of augmentation systems have been ARC's substantive work for over twelve years at SRI. A new stage of application known as the Workshop Utility service was established in 1974, providing nation-wide ARPA computer-network-accessed computer service and training to over 200 people at subscribing organizations' sites. ARC is involving an expanding group of system users, including some at SRI itself, so that the results of their past work will benefit knowledge workers on an increasingly large scale, and so that future system developers can obtain feedback needed for further evolution of the system. 1

JCN 14-JAN-75 15:54 25107

Draft Statement of Workshop Utility Activity for C.A.Anderson's Use

This is essentially the text of a very short (and quickly written) statement Bart Cox and Steve Miller are preparing for Chas. Anderson's use in his presentation to the SRI Council and for possible inclusion in the SRI Annual report.

JCN 14-JAN-75 15:54 25107

Draft Statement of Workshop Utility Activity for C.A.Anderson's Use

(J25107) 14-JAN-75 15:54;;;; Title: Author(s): James C. Norton/JCN;
Distribution: /DCW([INFO-ONLY]) RWW([INFO-ONLY]) RLL([
INFO-ONLY]) JHB([INFO-ONLY]) RA3Y([INFO-ONLY]) ;
Sub-Collections: SRI-ARC; Clerk: JCN; Origin: < NORTON,
CHARLIE,NLS;1, >, 14-JAN-75 15:39 JCN ;;;;####;

elephant meeting

Contradictions have been
alledged in our
description of the
elephant. 1

The review meeting will be at 3:00 2

A recursive definition plan should emerge. 3

elephant meeting

(J25108) 14-JAN-75 17:10;;;; Title: Author(s): Raymond R. Panko/RA3Y; Distribution: /RA3Y([ACTION]) ; Sub-Collections: SRI-ARC; Clerk: RA3Y; Origin: < PANKO, MEMO.NLS;1, >, 14-JAN-75 16:38 RA3Y ;;;;####;

RLB2 14-JAN-75 17:45 25109

Line processor changes for graphics.

Don, I would appreciate any comment. Some of these changes represent non-trivial changes to the existing code and I would appreciate some consulting service when you are down next time. Bob.

Line processor changes for graphics.

The following is a list of proposed and implemented changes to the line processor code to support graphics. The conditional assembly feature is used with [x] for the tektronix and [p] for the thermal printer 1

CHANGE 1 (done) 2

Copy printer string protocol vector remains unchanged; however, within the lineprocessor no buffer is kept and characters are taken directly from the ep and placed on the cp output port. Of course, the cp baud rate is assumed to be equal or greater than the ep rate. 2a

NO request string is issued. 2b

CHANGE 2 (working) 3

The A/D converter will be extended to 10 bits. The two least significant bit will be brought out through the free Iport #3. 3a

CHANGE 3 4

The cursor tracking for the A/N display will utilize the most significant 7 bits (128) for x and 6 bits (64) for y. This results in a 25% change in the x axis response and a near zero change in the y axis. 4a

CHANGE 4 5

The line processor will issue 10 bit big characters. 5a

CHANGE 5 6

Set up a flag to indicate which display is in use - A/N or Tektronix. 6a

CHANGE 6 7

Change the effect of the open printer protocol to inhibit tektronix cursor tracking and abort any tracking in progress. Occurance of this protocol insures 4 ep character times before ep data will be directed to the cp port. 7a

CHANGE 7 8

Change the effect of the close printer protocol to permit tektronix cursor tracking. 8a

CHANGE 8 9

Line processor changes for graphics.

Replace the existing cp output code with code to output the new cursor position. 9a

CHANGE 9 10

Figure out some way to indicate which window (tek or a/n) is in use. 10a

RLB2 14-JAN-75 17:45 25109

Line processor changes for graphics.

(J25109) 14-JAN-75 17:45;;;; Title: Author(s): Robert Louis Belleville/RLB2; Distribution: /DIA([ACTION]) CHI([INFO-ONLY]) JDH([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: RLB2; Origin: < BELLEVILLE, LP-MODS-GRAPHIC,NLS;1, >, 14-JAN-75 17:38 RLB2 ;;;;####;

RA3Y 14-JAN-75 17:56 25110

Howdy

Hello. I am slowly getting to know NLS. Jim Norton and Dean Meyer told me that the system is easy to learn. Now I don't want to call them any bad names, but it is true that they never lose at Solitaire.

I hope Gwen is coming along alright. She has many good qualities to make up for her obnoxious tendencies. I'm not sure what those qualities are. We found that when Gwen gets too far out of line, it is sufficient to hit her over the nose with a rolled up newspaper and say "SIT!"

I am enjoying the ARC a great deal. It will probably be less fun the second day. If I can be of any assistance, drop me a note. I needn't tell you what my ident is.

1

RA3Y 14-JAN-75 17:56 25110

Howdy

(J25110) 14-JAN-75 17:56;;;; Title: Author(s): Raymond R. Panko/RA3Y; Distribution: /LHD([INFO-ONLY]) MIKE([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: RA3Y; Origin: < PANKO, H1,NLS;1, >, 14-JAN-75 17:45 RA3Y ;;;;####;

JAKE 14-JAN-75 18:07 25111

Reference Service for ARC

In my opinion this message (2:w) forwarded to me by Jeanne Leavitt on Doug's behalf should be directed toward RWW or CHI as it probably has to do with our tree-meta language. If it is not ARC related then I suggest that Fran Greehan have Bill Norris call the NIC directly since the problem has lost so much in translation that I have no concept of what is needed. I will attempt to handle network-related reference questions that are referred directly to me; that is, where I have the opportunity to talk to the person with the problem. I will not take responsibility for second- , third-, and fourth-hand interchanges because I feel this is doing a disservice to the person with the problem. He would be better served if asked to make a direct phone call to the proper person. In addition, I would like to state that the NIC is no longer a reference service for ARC - currently this function is going begging and needs some direction from management. 1

::: 2

14-JAN-75 1701-PST LEAVITT: Phone Log
Distribution: FEINLER
Received at: 14-JAN-75 17:01:17 3

I fielded a call for Doug today from Fran Greehan of SRI-Wash office. He got a call from a Bill Norris of COMPSHARE (Phone (703) 524-1405. The question was, can he have documentation on the TREE or CTREE program which he sez is available on ARPANET. FG would basically like us to field the call for him, because he can't answer it:
Please mention that the call is basically in answer to the conv. he had with FG at SRI-Wash.
He wants us to call the guy and find out what he REALLY wants (its unclear) and then tell him if he can have it or not. If you need any person/time help, let me know. It seems to be a sort of NIC sort of ARC question. 3a

Reference Service for ARC

(J25111) 14-JAN-75 18:07;;;; Title: Author(s): Elizabeth J. (Jake) Feinler/JAKE; Distribution: /DCE([ACTION]) RWW([ACTION]) CHI([ACTION]) JML([ACTION]) JCN([INFO-ONLY]) FEEDBACK([INFO-ONLY]) ACM([INFO-ONLY]) ; Sub-Collections: SRI-ARC FEEDBACK; Clerk: JAKE; Origin: < FEINLER, PHONECALL.NLS;4, >, 14-JAN-75 18:01 JAKE ;;;;####;

HELP 14-JAN-75 19:27 25112

Development-Applications interface at the Help-Feedback level

In response to FEED's 31636

HELP 14-JAN-75 19:27 25112

Development-Applications interface at the Help-Feedback level

Dear FEED 1

Thank you very much for your message concerning RLL's 25060. We have already started incorporating his suggestion. Although we are starved for office-1 feedback concerning Help, we have already received RLL's 25060. It's too bad we can't easily check the distribution list to see if someone has already received it ... well, maybe some day.... A discussion of procedures seems appropriate anyway. 2

Please use the Forward command in the Sendmail subsystem to forward any items concerning Help to the ident HELP if you are not sure whether the proper person(s) dealing with Help have already received the item. The HELP group ident contains the proper person(s) to respond to feedback about Help. This should be less effort for you than creating and sending a seperate message about the item. You can, of course, add a parenthetical note to the ident HELP when you forward it, if necessary. 3

All major changes made to Help as well as those changes made in response to feedback from users are kept in <documentation, manual, done> which is published periodically. FEED is on that publication list so you should get the information you need to keep the feedback file up-to-date. Help items being completed are in, <documentation, manual, do>. 4

Since we don't yet have the proper mechanism, you can't replace your <feedback, feed, db> branch with a link to <ARC, documentation, manual, do> and add to Feed a link to <ARC, documentation, manual, done> so until then it looks like you will have some extra work keeping feed up-to-date with respect to help unless you want to periodically copy <ARC, documentation, manual,> to <OFFICE-1, documentation, manual,>. Then you could link to it. 5

Whatever works. 6

HELP 14-JAN-75 19:27 25112

Development-Applications interface at the Help-Feedback level

(J25112) 14-JAN-75 19:27;;;; Title: Author(s): Kirk E. Kelley/HELP;
Distribution: /FEED([INFO-ONLY]) RWW([INFO-ONLY]) JCN([
INFO-ONLY]) RLL([INFO-ONLY]) DVN([INFO-ONLY]) POOH([
INFO-ONLY]) KIRK([INFO-ONLY]) SRL([INFO-ONLY]) JHB([
INFO-ONLY]) ; Sub-Collections: HELP; Clerk: KIRK;

KIRK 15-JAN-75 00:15 25113

How about the OFFICE-1 operator?

If for various reasons (mostly having to do with the hassle that's currently necessary) no one in applications or development wishes to be responsible for moving userguide and documentation files to office-1, and since our own operators will be moving on to other things at the end of February, perhaps the appropriate person for "retrieving" files for OFFICE-1 from SRI-ARC is the same person responsible for "retrieving" files for OFFICE-1 from the archive: the OFFICE-1 operator. Anyone should be capable of requesting a file to be at OFFICE-1 by sending a message to the operator there. The tymshare operators certainly should know how to tranfer files. 1

KIRK 15-JAN-75 00:15 25113

How about the OFFICE-1 operator?

(J25113) 15-JAN-75 00:15;;;; Title: Author(s): Kirk E. Kelley/KIRK; Distribution: /JHB([ACTION]) JCP([INFO-ONLY]) RLL([INFO-ONLY]) RWW([INFO-ONLY]) JHB([INFO-ONLY]) JMB([INFO-ONLY]) POOH([INFO-ONLY]) DVN([INFO-ONLY]) JCN([INFO-ONLY]) JDH([INFO-ONLY]) ; Sub-Collections: SRI-ARC; dvn jcn rll jmb pooh; Clerk: KIRK;

KIRK 15-JAN-75 00:21 25114

The sendmail distribute command throws away idents with no warning

Any idents after a lastname search (preceded by a period, terminated by a semi-colon) are discarded. Nasty. Should be fixed asap. (This was in WORK, I assume it is the same for NLS). 1

KIRK 15-JAN-75 00:21 25114

The sendmail distribute command throws away idents with no warning

(J25114) 15-JAN-75 00:21;;;; Title: Author(s): Kirk E. Kelley/KIRK;
Distribution: /BUGS([ACTION]) FEED([ACTION]) JDH([ACTION]) ;
Sub-Collections: SRI-ARC BUGS; kirk dvn pooh ?; Clerk: KIRK;

POOH 15-JAN-75 12:19 25115

Set Tenex (protection for file named) CONTENT CONTROLS OK:

This command does not work at all. You receive the error message "Illegal Protection Specified" When it is fixed, I suggest that a Reset Tenex command also be put in. This way it will be like all the other Set commands that have Reset commands also. 1

POOH 15-JAN-75 12:19 25115

Set Tenex (protection for file named) CONTENT CONTROLS OK:

(J25115) 15-JAN-75 12:19;;;; Title: Author(s): Ann Weinberg/POOH;
Distribution: /FEEDBACK([ACTION]) POOH([INFO-ONLY]) ;
Sub-Collections: SRI-ARC FEEDBACK; Clerk: POOH;

RWW 15-JAN-75 13:01 25116

Record of Dialog With Fields on IT and Large Data Base Programs

Included below are two related notes to and from Fields relevant to the IT program. The main new thing learned is the cut off date for proposals. We need to decide what we want to do. Both Fields and Kahn are concerned about supporting work given their thinking that our best people are tied up with NSW. We should meet to discuss our plans soon. 1

Craig, I need some help which may in turn possibly help you. As I sit here playing manager, one of my immediate concerns is what my world is likely to look like starting in July. In particular, I feel somewhat confused about 1) your thinking on timing for the Intelligent Terminal and Large Data Base programs, and 2) what role or roles you may or may not be thinking we might or might not play in them. If you are thinking that we could contribute, then I want to be sure that we have the right staff available for you. Your input will also help me in seeing that the right people from here get to the right planning meetings you plan to have at all levels, from user interface, to tools to aid the process of building the systems or whatever. 2

From my discussions with you on the two programs and from what I read in Bob Anderson's report, I see three areas where we could contribute to achieving your goals. 3

1) SYSTEM STRUCTURE 3a

Except for item 3G in the report (Authentication) we have worked, built, or thought extensively in just about every other area discussed under System Structure. In fact I think I can safely say without breaking off our collective arm patting our back that few organizations have the breadth and depth of experience over this domain that we have. Your familiarity with our work here is such that I don't have to say more. 3a1

2) USER INTERFACE 3b

Here we have not worked or thought about all the areas described, but we have thought a lot about many of the issues and their implications for underlying system structure. I would like to be sure we had a chance to share our good and bad experiences and thoughts in this domain with the others you will have working here. 3b1

3) TECHNOLOGY TRANSFER AND COORDINATION ACROSS RELATED ARPA PROGRAMS 3c

ARPA is presently supporting work in two areas with a close relationship at various system and user levels with your two planned programs, NSW and COTCO. One of my desires is to do

whatever I can to help transfer approaches and ideas between them, to insure that concrete results like tools, protocols, user agents or whatever get built such that they can be shared or bootstrap each other, where appropriate, I would like to do what I could to help insure a system structure and conventions that would allow replacement of the old with the new and better without having to rebuild one system or the other from the ground up. These programs will want to interface to existing database management systems and other tools as well as develop new ones. For example, even if the IT can get built so that 90% of the users work and information can be handled stand alone, there will still be data bases, tools and certainly communicating that requires interface to the outside world. Our frontend and protocols roles in NSW, and collaboration with ISI in their use of PCP and NLS in their system give us a useful linking position. 3c1

15-JAN-75 1147-PST FIELDS at USC-ISI: YOUR NOTE ON NEW PROGRAMS
Distribution: WATSON AT SRI-ARC
Received at: 15-JAN-75 11:49:37 4

DICK,
I DON'T THINK THERE IS ANY ANSWER FOR YOUR NOTE. YOU ARE OBVIOUSLY ONE QUALIFIED GROUP FOR A NUMBER OF TASKS. YOUR GOALS ARE CONSISTENT WITH THE PROGRAM. YOU HAVE BEEN INVITED TO ALL THE MEET MEETINGS THAT SEEM REASONABLE. ANY PROPOSAL YOU SUBMIT WILL BE IN COMPETITION WITH OTHERS AND, I HOPE, JUDGED FAIRLY. MY ONLY CONCERN IS THAT YOU HAVE A LIMITED NUMBER OF TRAINED PEOPLE, AND I DO NOT INTEND TO PAY TO TRAIN NEW ONES THAT YOU HIRE IF I CAN AVOID IT.
YOU CAN AND HAVE GUESSED THE ROLES YOU MIGHT PLAY. PROPOSALS MUST BE IN BEFORE MARCH 1 WITH A DECISION ANOUNCED IN MARCH (I HOPE). YOU SHOULD ONLY DO SO IF YOU ARE WILLING TO GRACEFULLY ACCEPT A POSSIBLE NO ANSWER. I AM UNDER SOME PRESSURE TO FIND NEW NEW CONTRACTORS NOT IN THE CURRENT ARPA COMMUNITY.
I WILL BE HAPPY TO SPEAK WITH YOU IN LATE JAN AT THE MEETINGS, BUT THAT IS ALL I THINK I CAN SAY. 4a

BEST 4b

CRAIG 4c

RWW 15-JAN-75 13:01 25116

Record of Dialog With Fields on IT and Large Data Base Programs

(J25116) 15-JAN-75 13:01;;;; Title: Author(s): Richard W. Watson/RWW; Distribution: /CHI([ACTION]) DCE([ACTION]) JCN([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: RWW; Origin: < WATSON, CRAIG,NLS;2, >, 14-JAN-75 17:04 RWW ;;;;####;

KEV 15-JAN-75 13:40 25117

nsw debugging - 2nd draft

this document is basically the same as 25036 with some typos corrected and 2 additional comments. sent via sndmsg to balzer, crocker, carlson, warshall, millstein, bolduc, and waal.

nsw debugging - 2nd draft

This document is intended as a working document describing our current plans for the debugging of programs in an NSW environment. 1

Required Background Reading 2

1) The Procedure Call Protocol Version 2, by J. White (24590,) 2a

2) Tenex PCP Process Internal Structure [DRAFT], by J. White (24792,) 2b

Assumptions 3

We will assume the internal process structure discussed in 2 above, i.e., a PCP process consists of a controlling fork (CF), which is the process' link to the PCP process tree, and one or more processor forks (PF), each of which contains identical save file images. 3a

There will be one frontend process per frontend machine and this process will consist of one CF and at least one PF per active user. 3b

The Works Manager process (initially there will be only one, eventually there will probably be several for reliability purposes) will consist of one CF and probably on the order of one PF per active user. 3c

A tool backend will consist of a PCP process tree with one process tree per tool per (instance of each) user. Each process in the tool backend tree will consist of one CF and one or more PFs (at the tool implementer's disgression). 3d

We therefore have the following situations: 3e

In debugging a tool backend we can afford to suspend processing (e.g. upon encountering a breakpoint) of the entire process tree since we would be affecting only one user. 3e1

In debugging the Works Manager it would be nice if only the PFs associated with an individual user were affected by breakpoints, etc. However, since the proper operation of the WM is essential for the running of the NSW, we will assume that the debugging of the WM will suspend the entire process at a breakpoint, etc. (If there are several WM running then it should be possible to be debugging one instance of the WM while not affecting the other instances. However, if several WM are cooperating with each other, freezing one instance may effectively freeze other instances as well if the frozen WM has control of a limited resource. It may be necessary in such

cases to assume that debugging the WM is similar to debugging a time-sharing monitor and that it is impossible to debug and provide service to users at the same time.) 3e2

In debugging the frontend process, or tool grammars and/or parsefunctions, etc., it is not possible to suspend the entire process since it is precisely this process which is talking to the user. In addition, it is essential that any debugging scheme we use allow several users to be debugging at the same time. Therefore, breakpoints, etc., will affect only those PFs associated with an instance of a user. 3e3

The rest of this document will assume that the exact same implementation techniques will be used for the debugging of tool backends and the WM. However, due to the special requirements associated with the frontend, different implementation techniques will be required for debugging frontend programs. This does not mean that the user interface will be different, and in fact it will be the same regardless of whether a user is debugging a frontend or backend program. 3f

(Note that we will not be providing any tools for the debugging of the code that lives in the CF. We expect to use existing debugging tools to debug the CF once and that after it is running it need never be modified!) 3g

Basic Approach 4

Our basic approach involves placing an IDDT-like debugging PCP package in the CF. This package is talked to via standard PCP primitives and can talk to other packages in other processes via PCP. There will be a special process handle that enables one to talk to the CF fork in the PCP process. This package will then "monitor" the PFs of its process in host dependent methods (on Tenex and ELF most likely by sharing pages). 4a

Since the address space of the CF contains very little other than the debugging package, this package can be very sophisticated (at least on Tenex where there is a large address space) and can (and will eventually) support source language debugging. 4b

The PFs need contain no code to support the debugger. 4c

(We may have to back off on this statement as we gain some implementation experience. It may be necessary for the PF to provide state saving and restoring procedures.) 4c1

It will be necessary, however, for the PFs to provide some storage (on the order probably of 2 dozen words) that can be used by the

debugger, for calling procedures, etc., in the PF. We can use one or more of the following approaches to obtain this needed storage: 4d

We can require that all processes supply a low-level subroutine that returns the address of the N required words (where N has been previously published), and/or 4d1

We can require that all PFs leave the top (or some other well defined) N locations unused, and/or 4d2

The debugger can search the memory map of the PF to find some free core, and/or 4d3

The debugger can ask the user what core is available. 4d4

Debugging Tool Backend Process Trees and the WM 5

Let us initially consider the case where a user is at command level and decides to do some debugging. We will deal with runaway programs later. 5a

In this situation, the user will issue a universal command that indicates "Debug Tool". The universal tool backend procedure that deals with this command will then issue an inline PCP call to start a CLI in the frontend process. This will cause a new CLI PF to be activated; this PF will talk to the same terminal that the user is at and will have the debugger grammar as its active grammar. The initialization rule for the debugger may interact with the user to get such information as which tool is to be debugged, etc. and will make the appropriate PCP calls to open the debug package in the proper CF. 5b

The user is now using the debugger as she would use any other NSW tool and can issue whatever commands she wishes, e.g., modify core in the tool, set breakpoints, etc. 5c

When the user is done talking to the debugger directly, she issues the debugger "proceed" command. This action causes a PCP Temporary return to be made to the original PF. The user is now back talking to her original tool. 5d

In the future, if the user wishes to return to the debugger, she once again issues the universal command "Debug Tool", or she may be able to hit some special key that indicates "Debug Tool". However, now a PCP resume process call is made to the debugger PF. 5e

If the user set some breakpoints in the tool backend in her prior interaction with the debugger and one of these breakpoints is encountered (breakpoint implementation discussed below), the tool

backend will issue a PCP HELP return to the frontend process. The tool frontend PF that receives this HELP, which will be the PF that the user was using to talk to the backend with, will then issue the PCP RESUME to the debugger PF, and now the user is again talking to the debugger. 5f

We are now in a position to discuss runaway programs. If a user wishes to debug a runaway program, or wishes to do some debugging while not at command level, she hits a special key which means "Stop Tool". This causes the PCP Stop Process call to be issued to the tool and also causes the debugger frontend PF to be either started or resumed. 5g

Breakpoints 5h

When a user sets a breakpoint, it will be set in all PFs for the associated process. (Breakpoints on Tenex will most likely consist of the BPT jsys which is equivalent to a HALTF jsys.) The CF for the process is notified whenever any breakpoint is encountered. (This happens in Tenex by enabling the fork termination PSI.) The CF then freezes all its inferior PFs and PCP freezes its inferior processes and passes back up the chain of control the appropriate PCP HELP message. Any processes above the target process (but not the frontend process) will probably freeze all their PFs and PCP freeze their inferior processes not in the previous control chain and then pass on the HELP message. 5h1

(I recognize that there are several "religeous" statements in the above paragraph and that perhaps we don't wish to freeze the world upon hitting a breakpoint. However, it seems easier from both an implementation and conceptual (to me anyway) point of view. If we don't freeze the world and some other process tries to communicate with the frontend, what happens???) 5h1a

Debugging the Frontend Process and Tool Grammars, Parsefunctions, etc. 6

The differences between debugging the frontend process and backend processes have to due with the level of sophistication of debugging code that lives in the frontend process' CF and with the implementation of breakpoints. 6a

Since the address space available for the frontend CF is likely to be quite small (on the 11), there is no room to place sophisticated source language debugging code there. Thus to obtain the desired sophistication, the frontend debugging package will make PCP calls on a Frontend-Debugging Tool Backend process

(FDTBP). The combination of the frontend CF and the FDTBP will perform the necessary monitoring of the pertinent PF, either by sharing pages or by making use of ELF IPPs, or by using the ELF Debug Process. 6b

The implementation and action of breakpoints is also different for the frontend process. A breakpoint is only set in the PF associated with the user doing the debugging and not in all the PFs belonging to the process. Upon encountering a breakpoint, the frontend CF is notified and the proper PF is stopped (in fact it probably already is by virtue of the way we hope to implement breakpoints). The CF then PCP freezes the tool process trees associated with this user (once again religion) and then resumes the frontend debugging PF for this user. 6c

(Note that to initiate debugging the user must have issued the universal command "Debug Frontend".) 6c1

KEV 15-JAN-75 13:40 25117

nsw debugging - 2nd draft

(J25117) 15-JAN-75 13:40;;;; Title: Author(s): Kenneth E. (Ken) Victor/KEV; Distribution: /NPG([INFO-ONLY]) RWW([INFO-ONLY]) ; Sub-Collections: SRI-ARC NPG; Obsoletes Document(s): 25036; Clerk: KEV; Origin: < VICTOR, PCP-DEBUGGING.NLS;1, >, 15-JAN-75 13:25 KEV
;;;;####;

JDH 15-JAN-75 19:25 25118

No New NLS until the space problem is solved

The bringing up of new running versions of NLS is being delayed by a lack of space in the system. 1

In the current version of "WORK" which was to become the next running system, there are barely 2 pages for symbols for user programs. 2

It is not possible to load large user programs with many symbols (such as "FORMAT") with this little space. 2a

I know of three possible ways around the current problem 3

(1) Move a subsystem (such as CALCULATOR) out to be a user program. 3a

The main disadvantage of this is that users who want this subsystem always available must have their useroptions set to load it on entrance to NLS. This means extra time to start up NLS. 3a1

(2) Move some NLS code around to the high segment so the large programs will load (hopefully). 3b

There is about half a page left in the high seg, which may be enough for now. 3b1

This leaves almost nothing for bug fixes and small additions to NLS. 3b2

(3) Change call to the loader so local symbols are not ordinarily loaded with user programs. 3c

It hasn't been checked that such a call can be made from NLS, but it should be possible. 3c1

This would make the debugging of such large programs very difficult. 3c2

We need any other ideas about how to make the space. 4

Methods (2) and (3) are objectionable from my point of view. 5

We need some estimate on method (1) of how unpleasant a startup burden there would be and on how hard it would be on users here and at Office-1 to get their useroptions set properly.f 6

JDH 15-JAN-75 19:25 25118

No New NLS until the space problem is solved

(J25118) 15-JAN-75 19:25;;;; Title: Author(s): J. D. Hopper/JDH;
Distribution: /JCN([ACTION]) JHB([ACTION]) SRL([ACTION])
DSM([ACTION]) CHI([ACTION]) KIRK([ACTION]) KJM([ACTION])
EKM([ACTION]) HGL([ACTION]) ; Sub-Collections: SRI-ARC; Clerk:
JDH; Origin: < HOPPER, NLSSPACE.NLS;1, >, 15-JAN-75 19:16 JDH
;;;;####;

JAKE 16-JAN-75 09:09 25119

Identification subsystem

My last bout with the identification subsys had it online and loadable but with a bug which gave 'string to long' for a fairly short string of text. This I discussed about a week ago with Karolyn Martin and whe was going to fix. So far I have not heard from her that it has been fixed. 1

JAKE 16-JAN-75 09:09 25119

Identification subsystem

(J25119) 16-JAN-75 09:09;;;; Title: Author(s): Elizabeth J. (Jake) Feinler/JAKE; Distribution: /FEEDBACK([ACTION]) ; Sub-Collections: SRI-ARC FEEDBACK; Clerk: JAKE;

Some notes on possible NSW tool interaction

The following (Journal # 25120) are brief notes regarding tool interaction through the FE. Although some readers may find the implementation notes too technical, the examples and general discussion should be of interest. 1

The NSW can provide for significant tool interaction, driven by the user, by providing some fairly simple facilities in the FE, WM, and tools which wish to allow such interaction. We feel that this can be done in such a way that the WM can insure system integrity and provide access controls and such that neither tools nor their grammars need change to allow new tools to interact with each other. 1a

Perhaps the best way to communicate this facility is to present a few concrete examples. 1b

Example 1: Editor -- mail sender interaction 1b1

Let us assume that there exists two tools, one called EDITOR and one called SENDMAIL, with the obvious functions. Let us first consider a user sitting at a display terminal using the EDITOR to prepare a memo he wishes to send to some of his associates. He could prepare the memo, which could be just part of a larger file that he is editing, and create a file containing only the memo and give this file a temporary name. He could then run the SENDMAIL tool, supplying it the name of his temporary memo file. 1b1a

A simpler alternative is for the user to simply slue to the SENDMAIL tool and as input to the SENDMAIL command he could simply point to the portion of the EDITOR file he wishes to send. 1b1b

Example 2: mail sender -- Editor interaction 1b2

This involves the same tools as just described. The user types a lengthy message to the SENDMAIL tool and then wants to edit it before sending it. Again there could be a command in the SENDMAIL tool which causes it to create a file which can then be input to the EDITOR tool and Example 1 can be repeated. 1b2a

Again, the alternative allows the user to slue to the EDITOR tool and insert the text of the message into his file somewhere, edit it, and slue back to SENDMAIL and respecify the source of the message as in the second alternative in example 1. 1b2b

Example 3: Editor -- compiler interaction 1b3

In this example, the user is editing source code (the current edited state of the source code is known only to the editor) and wishes to compile some part or all of it. Again, he could create a file with that code in it and pass that file to the compiler. However, he could also just slue to the desired compiler tool and point to the desired text in the editor window and have it compiled. 1b3a

How to accomplish the slueing tool interaction 1c

One thing that must be considered if we allow the slue interaction is that the WM maintain control of the situation. Thus, for first year NSW I propose the following implementation: 1c1

The CLI provides a CML rule called SOURCE which is made up of the declared source rules of each of the user's currently active tools. The command language designer would, where appropriate, allow the user to specify one of the dynamic set of currently available sources for a command. 1c1a

When the user selects something of type TYPE (which is meaningful to TOOL-A) by pointing to TOOL-A's window or by typing its address (perhaps with TOOL-A's name appended to the front of the address) as an argument to a command to TOOL-B, then the CLI calls a standard function in TOOL-A which returns the name of a new file which contains the desired data object. This file name is then supplied as the desired argument to the execution function in TOOL-B. TOOL-B then calls the WM to open the file and read out the data structure. If the use-type of the file does not match the file type supplied with the openfile request, then an appropriate conversion is invoked. 1c1b

In subsequent development of the NSW it would be desireable for the tools to send PCP data structure to each other (perhaps using co-routines) rather than incurring the expense of creating and deleting files. However, for the interim, we can probably afford this inefficiency. 1c1c

For the case of users at typewriter terminals, the normal way in which they specify locations of actual parameters by typing something (which I call an ADDRESS) could be expanded so that the address could contain a syntactically unique way of specifying the active tool toward which it is directed. This facility is also available for user's at displays, since what they want may not be displayed on the screen currently. In the case of a display user, he might be able to point to the desired tool by use of an active

Some notes on possible NSW tool interaction

tools status window displayed whenever the user has more than one active tool. 1d

Implementation notes: 2

Add the builtin SOURCE to CML as the name of a rule of currently possible source command words. 2a

Allow SSEL, DSEL, and LSEL to deduce the target tool from a selection type and be able to invoke a standard function in a tool to produce the desired file when necessary. 2b

Allow incremental help if SOURCE is an alternative, such that current tool alternatives are shown separately from others. 2c

Define the standard function in tool processes to call in order to create the result file. 2d

CRTNSWFILE(type, designator => filename) 2d1

type = INTEGER
designator = ANY
filename = CHARSTR 2d1a

CRTNSWFILE requires the following facilities from the WM: 2d1b

1) The procedure UNQNSWFN(number => filenamelist) 2d1b1

which will yield a list of NUMBER unique NSW file names. 2d1b1a

2) An additional parameter in the CREATE-FILE procedure to specify that the file is to be TEMPORARY (will be automatically deleted at the end of the session). 2d1b2

It should be noted that these are the only changes required in the WM. Also, the CRTNSWFILE procedure is the only additional requirement on tool components to allow all of this to work. 2d1c

TYPE is a source type known to the CRTNSWFILE being called, DESIGNATOR is a data structure that CRTNSWFILE understands and when combined with TYPE specifies the desired data structure. 2d1d

For example, DESIGNATOR might be an ADDRESS string or a (WINDOW, STRING, CHARACTER-COUNT) triple that defines some image that the tool placed on the user's screen. 2d1d1

Some notes on possible NSW tool interaction

Add a parse function NOTINRULE which will succeed only if the specified command word is NOT one of the alternatives in a specified rule (see example below). 2e

Add a CML declaration for the rule that defines the universal sources for this grammar (this will get linked to the dispatch record). 2f

```
DECLARE SOURCES ,ID; %name of a rule of command words%          2f1
```

This would allow the following CML for the NLS copy command 2g

```
"COPY"                                                          2g1

   stype _ SOURCE                                               2g1a

      % user will pick one of the currently available source
      command words.  This is a function of his active tools %  2g1a1

   <"from"> source _ SSEL(stype)                                2g1b

      % user selects a source for the copy -- SSEL would have
      to be able to tell stype was from another tool and invoke
      the CRTNSWFILE procedure in the correct tool process if
      it is not the current tool %                              2g1b1

   <"to follow"> dtype _ stype %initialize dtype%               2g1c

      [ (notinrule(stype, mytypes) stype _ #"FILENAME" /
      OPTION) dtype _ mytypes]                                  2g1c1

         %if the source type (stype) was not one of this tool's
         source types as represented by the rule MYTYPES, or if
         the user types the OPTION character, then the user
         will specify a destination type (dtype).%              2g1c1a

   dest _ DSEL(dtype) %get the destination selection%           2g1d

   CONFIRM %get a final confirmation%                           2g1e

   xcopy(stype, source, dtype, dest);                           2g1f

      %call the XCOPY procedure in the tool process to carry
      out the command%                                          2g1f1
```

CHI 16-JAN-75 11:38 25120

Some notes on possible NSW tool interaction

(J25120) 16-JAN-75 11:38;;;; Title: Author(s): Charles H. Irby/CHI;
Distribution: /RWW([INFO-ONLY]) NPG([INFO-ONLY]) DCE([
INFO-ONLY]) DLS([INFO-ONLY]) MAW([INFO-ONLY]) FJH([INFO-ONLY
]) TFL([INFO-ONLY]) ; Sub-Collections: SRI-ARC NPG; Clerk: CHI;
Origin: < NSW-SOURCES, FE-TOOL-INTERACTION.NLS;1, >, 16-JAN-75 11:10
CHI ;;;;####;

CHI 16-JAN-75 09:44 25121

space problem in NLS

Dave, the following occurs to me re the space problem you mention in 25118,
1) there are several pages of code that could be deleted in PRMSPC (support for the old INPUT constructs),
2) the user-profiles of all users could be changed automatically using a program KEV wrote some time ago,
3) the loading of user programs at startup time could be made very quick by using a GET instead of invoking the loader. Talk to DSM or CHI for details here,
-- Charles,

1

CHI 16-JAN-75 09:44 25121

space problem in NLS

(J25121) 16-JAN-75 09:44;;;; Title: Author(s): Charles H. Irby/CHI;
Distribution: /NPG([INFO-ONLY]) ; Sub-Collections: SRI-ARC NPG;
Clerk: CHI;

DVN 16-JAN-75 09:46 25122

Response to Distributed Review [31643]

Thanks. I did everything you said. Any thoughts on content? 1

DVN 16-JAN-75 09:46 25122

Response to Distributed Review [31643]

(J25122) 16-JAN-75 09:46;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /SGR([ACTION]) JOAN([ACTION] dpcs anddirt notebooks please) ; Sub-Collections: DIRT DPCS SRI-ARC; Clerk: DVN;

DCE 16-JAN-75 09:51 25123

Coming visit by Jeff Franklin, Fri 17 Jan 75

Jeff Franklin will be here Friday afternoon, 17 Jan 75, from about 1515. His call indicated that he has been dealin wth the Department of Labor, relative to helping them with what we'd call AKW support for their IOSH (industrial safety and health) data and report generation problems. 1

Jeff visted us in July of 73 (see -- 17603,), and I had first met him at the NCC the previous month. I informed him of the subsequent advances in our applications support, and told him about our other contacts with the IOSH (e.g. NIOSH and the SRI NIOSH Project). 2

I told him that we welcomed intermediate system as and applications people putting our stuff to work as third parties, but also added that if we happened not to see how a third party would benefit the end customer, we'd perhaps not go along with the intermediate guy. Welcomed him anyway. 3

Jim Norton and I talked, agreed that Rob Lieberman would be best to host Jeff. (O.K., Rob?). 4

DCE 16-JAN-75 09:51 25123

Coming visit by Jeff Franklin, Fri 17 Jan 75

(J25123) 16-JAN-75 09:51;;;; Title: Author(s): Douglas C. Engelbart/DCE; Distribution: /JCN([ACTION]) RLL([ACTION]) JHB([INFO-ONLY]) RA3Y([INFO-ONLY]) RWW([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: DCE;

DVN 16-JAN-75 10:00 25124

Please make some Ident file changes.

Please add to the ident HELP Pooh, DVN and &dirt. Please add to dpcs
rll. please remove NDM from DIRT. Thanks. D. 1

DVN 16-JAN-75 10:00 25124

Please make some Ident file changes.

(J25124) 16-JAN-75 10:00;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /MLK([ACTION]) JOAN([ACTION] dirt and dpcs notebooks please) POOH([INFO-ONLY]) KIRK([INFO-ONLY]) RLL([INFO-ONLY]) NDM([INFO-ONLY]) ; Sub-Collections: DIRT DPCS SRI-ARC; Clerk: DVN;

CHI 16-JAN-75 10:03 25125

Lastname querry in SENDMAIL distribution lists

Kirk's 25114 documents a misunderstanding about how .lastname querries work in SENDMAIL and IDENTIFICATION subsystems. When you type.LASTNAME you must terminate it with ... or CA or , (comma). SPACE CANNOT be used to terminate a lastname since there are obviously lastnames that include the character SPACE (van de Riet). Thus, I suggest that as a methodology that you always use comma to separate idents and querries in identlists. -- Charles. 1

CHI 16-JAN-75 10:03 25125

Lastname querry in SENDMAIL distribution lists

(J25125) 16-JAN-75 10:03;;;; Title: Author(s): Charles H. Irby/CHI;
Distribution: /SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC;
Clerk: CHI;

KEV 16-JAN-75 12:05 25126

half-duplex terminals

There appear to be two basic approaches in dealing with half-duplex, line at a time terminals: 1

In one method, the default keyboard state is locked, and the keyboard is only unlocked when a program asks for input from the user. This is a basically you talk, I talk, approach and forces a synchoneous approach. It elimates a type-ahead type of interaction, and can conceivably be frustrating to use. It would also seem to prohibit asynchronous input from a user. 1a

In the other approach, the default keyboard state is unlocked. Using this approach the user can type ahead and enter asynchonous input. However, the keyboard can and will be locked whenever the program does output to the terminal. This can occur in the middle of user input. If this happens, in the worst case the user loses all that he has typed since his last transmission; in the best case nothing is lost, but the terminal typescript may not look nice; in between these extremes, the user may or may not lose the last character, i.e. the character he was typing at the time the line was turned around. 1b

Multics uses the latter approach, and I beleive the NSW should also use the latter approach, i.e. the default will be to leave the keyboard unlocked. I would appreciate any comments with regards to this issue. 2

KEV 16-JAN-75 12:05 25126

half-duplex terminals

(J25126) 16-JAN-75 12:05;;;; Title: Author(s): Kenneth E. (Ken) Victor/KEV; Distribution: /KEV([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: KEV; Origin: < VICTOR, HALF-DUPLEX-TERMINALS.NLS;1, >, 13-DEC-74 11:02 KEV ;;;;####;

RLL 16-JAN-75 15:12 25127

SUG: Automatic requesting of referenced items.

Wouldn't it be neat to have the system automatically request from archive any reference that is made in a new journal item. 1

Of course some checking would have to be done to find if it was already online and if not where it was; then request it from operator. 2

This allows the people on the distribution lists of the newly sent journal item to have immediately any referenced item without looking it up in some hardcopy library or waiting for it to be returned by the operator. 3

The proposed new field in journal items, REFERENCES, would be very useful for this. It would be especially long to search the entire submitted item for any link. Perhaps the comments field could be used in the mean time (before the REFERENCES field is implemented.) 4

RLL 16-JAN-75 15:12 25127

SUG: Automatic requesting of referenced items.

(J25127) 16-JAN-75 15:12;;;; Title: Author(s): Robert N. Lieberman/RLL; Distribution: /FEED([ACTION]) DCE([INFO-ONLY]) JCN([INFO-ONLY]) JAKE([INFO-ONLY]) NDM([INFO-ONLY]) JHB([INFO-ONLY]) JDH([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: RLL;

KEV 16-JAN-75 17:31 25128

old todo list

NLS 1

process commands interactive language 1a

user-option mouse button macroes 1b

make detach command work 1c

L:/[**]: turned off prompting 1d

undelete modifications 1e

" and linefeed commands 1f

copy, show, expunge archive directory 1g

retreive, delete, and undelete archive file 1h

show who is on 1i

show where is user 1j

INTERROGATE 2

don't print tape numbers unless asked for 2a

make command recognition like exec 2b

make file name recognition like gtjfn 2c

IMLAC Stuff 3

3444 : Net mail from site MIT-DMCG
Distribution: VICTOR
Received at: 26-FEB-74 08:40:18 3a

configuration questionaire - MIT-DMS

The IMLAC MUST have a minimum of 8K of memory.

Who, from your site, is to be responsible for the IMLAC with regards to communication with ARC, i.e, who is to be the member of the IMLAC users group?
name .....Dave Lebling.....
sndmsg address for this person ..PDL @ MIT-DMS.....

old todo list

journal ident of this person
....PDL.....

Optional second person
name .....Mike
Brescia.....
sndmsg address for this person ...MB @
MIT-DMS.....
journal ident of this person
.....MB.....

Does this IMLAC have the interrupt on character output feature?
(yes or no) ,yes,,
Does this IMLAC have the interrupt on keyboard input feature?
(yes or no) ,yes,,
Does this IMLAC have the interrupt on 40 cycle synch feature?
(yes or no) ,yes,,
What should the value of the interrupt arming word be for your IMLAC?
The following is a list of what we think the bits represent.
Please indicate the proper value (0 or 1) for each bit and what
the bit represents if not the standard device.

bit	standard device	value	non-standard device
15	light pen	..0..	.....
14	40 cycle SYNC & end of display frame	.1,,	.....
13	memory protect	..0,,	.....
12	TTY receive	..1,,	.....
11	keyboard	..1,,	.....
10	TTY send	..1..	.....
9	joystick, mouse, or trackball	..0,,	.....
8	tablet	..0,,	.....
7	punch	..0..	.....
6	keyboard #2	..0,,	.....
5	TKA IN	..0,,	.....
4	TKA OUT	..0,,	.....
3	16 bit input/PTR	..0..	.....
2	addressable clock with interrupt	..0..	.....
1		..0..	.....

3a1

old todo list

```
      0                               ..0..   ..................
   Does this IMLAC have a mouse and keyset?
      (yes or no)     ..yes.
           like SRI-ARC  .yes..
   Does this IMLAC have a Sylvania tablet?
      (yes or no)     ..no..
   Does this IMLAC have long vector hardware?
      (yes or no)     .yes..
   Which serial interface port on the IMLAC will your host (or
TIP or
   IMP) be attached to?
      If on the TTY port, (indicate by 0), a read character
and clear
      flag IOT would be 1033.
      port? (0 or 1) ..0...
   How much memory does this IMLAC have?
      (4K, 8K, etc.) ..8k..
   Do you have a cassette?
      (yes or no)     ..no..
   What address would like control-shift-break to transfer
control to?
      (We suggest that you specify the address of your rom
cassette
      loader if you have one; if not, then the next best thing
is to
      specify the starting address of the ROM LOADER that you
will be
      using (probably 40, 100, or 14034).).
      (octal number) ..40.. ( special tty rom - 4bit )
usi26-FEB-74 13:54:05,703                                        3a2
```

NJN IMLAC Configuration for new DNLS site
16-APR-74 13:40 (LJOURNAL, 30488, 1:w) 3b

Comments: The questionnaire can also be found in
OFFICE-1:<BBN-NET>IMLAC-QUESTIONNAIRE.NLS 3b1

18-DEC-73 1704-PST UCLA-NMC: IMLOAD
Received 18-DEC-73 17:04:05 3c

This is Mike Urban at UCLA-NMC. (just gotta learn to use the Journal) We are having a new and different failure to load our Imlac with IMNLS using the IMLOAD program. The bootstrap you send seems to cause the IMLAC to go into a loop around location 15451, and no loading is accomplished. This problem doesn't occur when using the ROM loader that is part of IMNLS, and PACKER works admirably in both cases. Can you help? Also, I have (in <IMLAC>) a version of IMTSE which has all our local

patches, and is loadable with PACKER. How, if at all, can IMLOAD be used to accomplish the loading of this program?
Mike 3c1

15-NOV-73 13:03:22 SBP AT MIT-DMS: imlac interest group
Received 11/15/73 1602-EST 3d

Happy to be stuck on as a member of the Imlac Interest Group, but unfortunately I don't think I will have time for much participation. However, Dave Lebling is our resident expert on Imlac software, and Jack Haverty is our resident expert on Imlac hardware. If, in fact, no Imlac Interest Group meeting is scheduled, perhaps Dave can coordinate with you and schedule such a meeting. From my point of view, such a meeting could accomplish several things:

1. Gather a data base about the Imlac installations around the Network and try to develop a protocol for Imlac programmers to use in designing and implementing Imlac programs so that Imlac programs could be shared among installations.
2. Develop a protocol that would allow hosts to load Imlacs via Network connection (this is simple, but it needs a in our case, two consecutive "A's in sequence causes any of our Imlac programs to branch to the loader.
3. Gather data about what special hardware has crept into the various Imlacs in the ARPA community. If any of it looks super good, persuade all ARPA contractors with Imlac installations to install this hardware or at least provide a mechanism for translating programs so that they will work without the hardware.

If an IMLAC interest group meeting has already been held and these topics covered, then perhaps Dave need only give you our input. If not, then perhaps these topics and/or ours of interest could be discussed.

Dave Lebling is PDL on DMS and Jack Haverty is JFH. You can contact them by SNDMGS to those idents on DMS.

A. Vezza

cc: Marcia Keeney 3d1

make imnls respond to use long characters with terminal type, page and line length 3e

KEV 16-JAN-75 17:31 25128

old todo list

(J25128) 16-JAN-75 17:31;;;; Title: Author(s): Kenneth E. (Ken) Victor/KEV; Distribution: /KEV([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: KEV;

DSM 16-JAN-75 17:50 25129

Disk Files Produced from Air Force Tape from Liz Riddle

The following files in my directory were created from the tape from Liz Riddle. 1

< MAYNARD, AFTAPE.RAW;1, > 1a

The output from MTACPY 1a1

< MAYNARD, AFTAPE.RECSIZ;1, > 1b

Record inventory file produced by MTACPY 1b1

< MAYNARD, AFTAPE.CNV;1, > 1c

Output from TAPCNV (has 672 extra characters in each block, added at no extra cost on the B6700) 1c1

< MAYNARD, AFTAPE.OK;1, > 1d

Has the extra characters removed from each block. 1d1

< MAYNARD, AFTAPE.NOSEQ;1, > 1e

Has sequence numbers removed and a carraige return inserted at the end of each record 1e1

< MAYNARD, AFTAPE.NLS;1, > 1f

Results of Copy sequential from AFTAPE.NOSEQ 1f1

< MAYNARD, AFTAPE.NLS;2, > 1g

Trailing blanks have been removed from each statement. 1g1

What should I do with these files? 2

DSM 16-JAN-75 17:50 25129

Disk Files Produced from Air Force Tape from Liz Riddle

(J25129) 16-JAN-75 17:50;;;; Title: Author(s): David S. Maynard/DSM; Distribution: /EKM([ACTION]) ; Sub-Collections: SRI-ARC; Clerk: DSM;

DVN 16-JAN-75 21:54 25130

Comments on Printing Executive Report

Frank,
I loaded and printed a copy of Executive-Report. Once we get rid of the Pshow it looks fine. In fact I would say Mr. Martin did a smart and patient job, Really surprisingly so for a beginner. My inspection, ignorent of content and the details of the format he was conforming to, saw nothing out of line. 1

Did he realize that he could have layed out the pages for back to back printing? That is, directives such as HP=OddL flip flop headers and so forth so you can print gracefully on the back and front of each sheet of paper. 2

I will mail you a copy in the morning. 3

I sent the COM file to ISI. I think I will wait before sending it to the vendor, DDSI, until the weekend when some other files will have piled up. The resulting printout should look like the lineprinter version I am sending you except for small variations in line length and cleaner, darker, more even type. 4

5

Relaitve to other COM: 6

I think because the paragraph indenting does not resemble any of the standard formats it would not be useful to run the format subsystem on it, 6a

There is another rout which could get you certain advantages without too much work. You could simply set the defualt font to one of the proportionally spaced fonts. 9-point Times Roman would be clear and contrast with Courier. That would look nice and save you about 40% in page length. But more interresting than compression, you could then set off your examples of code by printing them in some contrasting type face; 10-point courier looks appropriately machin-like in contrast with Times Roman. You cuild do this only with the figures such as 12 which don't stand out from the text much as they are, or reset smaller units such as 8g1c1, or, smaller sections such as the beginning of the definitions below 8g1c1 6b

In that case you would probably want to set top-level headings in slightly larger type, and maybe headers and footers and the title page. 6c

If you are interested in something like that, we could work on it together when next you're out here. If only the figures, headers, footers and top-level headings varied from the default, it wuld be no moe than a couple of hours work.. 6d

Comments on Printing Executive Report

I think you would not want to use two columns becaus of many figures and centered items. 6e

DVN 16-JAN-75 21:54 25130

Comments on Printing Executive Report

(J25130) 16-JAN-75 21:54;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /JOAN([ACTION] dpcs notebook please) FGB([INFO-ONLY]) JCN([INFO-ONLY]) RLL([INFO-ONLY]) JHB([INFO-ONLY]) NDM([INFO-ONLY]) ; Sub-Collections: DPCS SRI-ARC; Clerk: DVN;

KIRK 17-JAN-75 01:59 25131

utter ridiculousness

Why is it that when you type the back arrow key in the Help command to go back to the beginning, it says "no others have been shownY/N OK:" and then re-prints the entire view of your current location? This is utter ridiculousness. So what if the user typed one too many backarrows? I swear, the help accessing system which should handle the user with kid gloves has the sloppiest implementation in all of NLS. 1

KIRK 17-JAN-75 01:59 25131

utter ridiculousness

(J25131) 17-JAN-75 01:59;;;; Title: Author(s): Kirk E. Kelley/KIRK;
Distribution: /HGL([ACTION]) FEED([ACTION]) DIRT([INFO-ONLY]
) ; Sub-Collections: SRI-ARC DIRT; Clerk: KIRK;

HGL 17-JAN-75 09:48 25132

Back Arrow in Help -- re Kirk's recent message

cf (25131,)

HGL 17-JAN-75 09:48 25132

Back Arrow in Help -- re Kirk's recent message

Granted the sloppiness of the current Help implementation, I don't think the adjective should apply to the instance Kirk describes. A user has the option of accepting the place presented to him in the feedback window after a backarrow has been hit by typing a yes or a no (any character other than a Y or CA). This is exactly the same convernţion used in Jump to Return and Jump to File Return. In the name of holy consistency, I feel the criticized aspect of the current help back implementation does not warrant modification unless and until the design for those other commands ha been changed. (There are aspects of the backk command which should be changed first, if anyone is interested: e.g., the fact that in multi-displays of long menus you don't go back into inter-menu frames. The mods are somewhat expensive inthese resource inflationary times.) 1

HGL 17-JAN-75 09:48 25132

Back Arrow in Help -- re Kirk's recent message

(J25132) 17-JAN-75 09:48;;;; Title: Author(s): Harvey G. Lehtman/HGL; Distribution: /KIRK([ACTION]) EKM([INFO-ONLY]) RWW([INFO-ONLY]) POOH([INFO-ONLY]) DVN([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: HGL;

Proposed List Data Type for L10

Introduction 1

These hastily-drawn notes describe a list data type whose addition to L10 (and L10ii) is proposed. Comments? 1a

Internal (PDP-10) Format 2

Hword Maximum number of elements 2a

Hword Current number of elements 2b

Hword Length in words of list-global storage 2c

Hword Addr of list-global storage or zero 2d

Word Element 1 Descriptor 2e

Bit 0 One if element is list 2e1

Bit 1 One if space for element owned by list 2e2

Bits 2-3 Element Location 2e3

00 Element addr in descriptor 2e3a

01 Element value in descriptor 2e3b

10 Element offset in descriptor 2e3c

11 Element is EMPTY 2e3d

Bits 4-17 Unused (zero) 2e4

Bits 18-35 Element addr, value, list-global storage offset, or 0 2e5

Word Element 2 Descriptor 2f

... 2f1

In keeping with current L10 philosophy, an element is untyped, except that it is known at run-time whether or not the element is another list. 2g

Declaration 3

LOCAL (for example) LIST list [elements]; 3a

LOCAL LIST list _ elem1, elem2, ..., elemn; 3b

Declares a list with list.M = ELEMENTS and list.L = 0, or with list.M = list.L = N and initial element values ELEM1 through ELEMN. 3b1

Attributes 4

Maximum number of elements 4a

list.M 4a1

Current number of elements 4b

list.L 4b1

Write 5

Introduction 5a

In all of the primitives described below, ELEMI may be any of the following: 5a1

1) a STRING (enclosed as usual in asterisks), a LIST (enclosed in poundsigns), or an element or sublist (treated as a list) of a LIST. 5a1a

All these are, in general, multi-word data structures whose length is potentially determinable by the list run-time machinery (LRM). Such elements are added to the list by allocating sufficient storage, copying the element to that storage, and storing its address in the element descriptor. 5a1a1

The list-global storage fields in the list format are included to permit the LRM (if it desires) to privately manage a small block of storage for use in storing the values of several elements. E.g. the block might by list.M words long, and its ith word reserved for the value of the ith element of the list, whenever the element has a single-word representation. 5a1a1a

If the element is ever replaced or deleted from the list, the LRM will release the storage. 5a1a2

2) anything in item (1) above preceeded by '! 5a1b

The LRM simply stores the address of the source data structure in the element descriptor, assuming that the programmer knows what he's doing (e.g. intends to treat the element as read-only). 5a1b1

3) anything in item (1) preceeded by "!!" 5a1c

The LRM stores the address of the source data structure in the element descriptor, assuming that it has been pre-allocated by the programmer and its ownership is being transferred to the list. 5a1c1

4) anything else (e.g. 23, $"SRI-ARC") 5a1d

The LRM stores the indicated single-word data structure in (or with) the list. If its high-order 18 bits are zero, its value is stored in the element descriptor; otherwise, storage is allocated for it. 5a1d1

5a1e

Construct 5b

#list# ← elem1, elem2, ... elemn; 5b1

Exactly equivalent to: 5b1a

#list# ← ; 5b1a1

#list# !← elem1, elem2, ... elemn; 5b1a2

Reset 5c

#list# ← ; 5c1

Resets list.LL to zero and releases all storage owned by the list 5c1a

Append 5d

#list# !← elem1, elem2, ... elemn; 5d1

Appends ELEM1 through ELEMN to the list, increasing list.LL by N, checking for list.LL > list.ML 5d1a

Element replacement 5e

#list# [i] ← elem 5e1

Replaces the ith element of the list and releases all storage both owned by the list and associated with the element. 5e1a

Sublist replacement 5f

#list# [i, j] _ elem1, elem2, ... elemn 5f1

Replaces with ELEM1 through ELEMN, the ith through jth elements of the list and releases all storage both owned by the list and associated with the elements. 5f1a

Read 6

The following have the obvious values when used in an expression. The first two may appear only in contexts where a list is appropriate; the third is an ordinary L10 data structure and may thus appear in any context in which a data structure of its type (e.g. integer, string, address) is appropriate: 6a

#list# 6a1

#list# [i, j] 6a2

#list# [i] 6a3

Proposed List Data Type for L10

(J25133) 17-JAN-75 10:23;;;; Title: Author(s): James E. (Jim) White/JEW; Distribution: /SRI-ARC([ACTION]) ; Sub-Collections: SRI-ARC; Clerk: JEW; Origin: < WHITE, LISTDSGN,NLS;3, >, 17-JAN-75 10:21 JEW ;;;;####;

JBP 17-JAN-75 10:30 25134

Regarding the user program APPEND

The user program append is a piece of junk.
It contains undefined Globals and blows up if one attempts to run it.
Either it should be fixed or removed.
--jon.

1

JBP 17-JAN-75 10:30 25134

Regarding the user program APPEND

(J25134) 17-JAN-75 10:30;;;; Title: Author(s): Jonathan B. Postel/JBP; Distribution: /FEED([ACTION]) FDBK([ACTION]) BUGS([ACTION]) ; Sub-Collections: SRI-ARC FDBK BUGS; Clerk: JBP;

JDH 17-JAN-75 11:27 25135

PRMSPC code

Charles, is the code you suggested deleting in PRMSPC to support user programs which haven't been changed? I wonder how big a worm bucket we would be opening. 1

JDH 17-JAN-75 11:27 25135

PRMSPC code

(J25135) 17-JAN-75 11:27;;;; Title: Author(s): J. D. Hopper/JDH;
Distribution: /CHI([ACTION]) ; Sub-Collections: SRI-ARC; Clerk:
JDH;

RLL 17-JAN-75 11:48 25136

SUG: new command == Show Record (for) IDENT/LASTNAME

How about a command in the SENDMAIL subsystem that Shows Record for Lastname? It would be exactly the same as SHOW RECORD (for ident) but allow one to BUG a word as the last name. 1

The problem, clearly, is how to integrate both show record commands. 2

If the command were: SHOW RECORD C/B/[T/A]: then to type an ident it would require an option character, BAD for such a common situation. (Would not be so bad if option character were a space, but alas, we went through that before). 3

One possibility would be to have the commands SHOW RECORD (for) IDENT/LASTNAME... Then for IDENT and LASTNAME the Prompts would be the same. 4

RLL 17-JAN-75 11:48 25136

SUG: new command == Show Record (for) IDENT/LASTNAME

(J25136) 17-JAN-75 11:48;;;; Title: Author(s): Robert N. Lieberman/RLL; Distribution: /FEED([ACTION]) JDH([INFO-ONLY]) JHB([INFO-ONLY]) JAKE([INFO-ONLY]) JCN([INFO-ONLY]) ; Keywords: suggestion command; Sub-Collections: SRI-ARC; Clerk: RLL;

KEV 17-JAN-75 13:08 25137

more on NSW debugging

sent via sndmsg to balzer, crocker, carlson, warshall, millstein, bolduc, and waal.

KEV 17-JAN-75 13:08 25137

more on NSW debugging

It has been pointed out to me that the document I distributed about NSW debugging (25117,) was missing a paragraph detailing the intended function of the debugging techniques described. So here it is. 1

The debugging techniques described will be used by SRI-ARC to assist in the implementation of their NSW tasks. Since development of other first year NSW tasks is concurrent with the development of these tools, I do not expect others to use these techniques for the initial development of their NSW tasks. However, as these tools become firmed up, and for the future development of new NSW tools, and for the maintainance of the NSW (including remote maintainance of the Frontend), I would expect the described techniques to be used. I am interested in any feedback on the proposed scheme. 1a

The debugger will initially provide assembly language debugging facilities for both a pdp-10 and a pdp-11. In time, additional modules will be provided to supply high level language debugging aids. My intention is to define the interface to these modules such that one can plug in the module that is appropriate for the target language. We (SRI-ARC) will provide the L10 module. 1b

KEV 17-JAN-75 13:08 25137

more on NSW debugging

(J25137) 17-JAN-75 13:08;;;; Title: Author(s): Kenneth E. (Ken) Victor/KEV; Distribution: /NPG([INFO-ONLY]) RWW([INFO-ONLY]) ; Sub-Collections: SRI-ARC NPG; Clerk: KEV;

RA3Y 17-JAN-75 14:09 25138

Hi Gwen. I'm on NLS now. Since I'm on at ARC, rather than Office-1, send message through the Sendmail subsysten, rather than through TENEX's SND command.

Things are really going great down here. I'm feeling the same excitement you felt when you went to Bell Canada. Got to run to class now. See you (or is it "view" you) later. Bye-bye.

1

(J25138) 17-JAN-75 14:09;;;; Title: Author(s): Raymond R. Panko/RA3Y; Distribution: /RA3Y([ACTION]) ; Sub-Collections: SRI-ARC; Clerk: RA3Y; Origin: < PANKO, GWEN.NLS;1, >, 15-JAN-75 12:58 RA3Y ;;;;####;

This is a brief note on training, reflecting my experiences with training at ARC, but also drawing upon what I know about teaching theories and philosophies--which isn't much. The note is hierarchical. 1

The arguement of this note is that we need to structure our training program so that the trainee is given very thorough grounding at each step along a path that is carefully laid out along lines of explicit behavioral objectives. Two advantages are claimed. First, if this is not done, it is difficult to train users subsequently, because they will not have information needed to learn each next step. Second, if it is not done, we will be continuously innundated by trainees' calls for help, as they inevitably do things that were skipped over but which we do claim to support. 2

Setting Objectives and Assessing Knowledge 3

From my brief experience with the system, it seems that training is taking place by the "seat of the pants," that is, the trainers do not have a precise idea of what they are trying to teach at any moment in time. 3a

This has two hazzards. First, when the session ends, the trainee may not have all the skills he or she needs . The next time he or she tries to use what was just learned, an unexpected situation may arise that cannot be handled per the instructions. . This can be frustrating, It can be avoided. 3b

The second hazzard is that the trainee will stumble over lessons because he or she does not have a piece of knowledge needed to understand what is being taught. In a sense, what the trainer gains early-on by taking an informal approach may be paid for later, when the trainee has a hard time assimilating what is being taught. 3c

Frustration is a very bad thing if you don't have a captive learner. I am a little concerned that our training may be slowing down adoption in client organizations. 3d

A Proposal to Develop a Formal Lesson Plan 4

I would like to propose that ARC develop a formal lesson plan. To do this we must specify learning objectives hierarchically, and also figure out what information must be learned prior to what other information, so that we can develop a linear teaching plan. 4a

To set objectives, we should first make a list of Actions that a user should be able to take, for example "send a memorandum once it has been written." A list of about seven major objectives will probably serve for the initial training session. 4b

Second, we should work back and specify exactly what a user should know before taking a lesson to learn each activity. Ideally, we would find that some entire Actions are logically prior to others. Of course a totally linear progression is unlikely. 4c

Third, we should be able to group some preliminary knowledge into Preliminary Actions that are not end objectives like writing or editing messages, but which nevertheless are critical to the learning process. 4d

This may be an Achillies Heel in our training program. At least in my experiences, the training program doesn' give enough basics that the user can learn without annoyance. Perhaps because this is not an area that will be useful after the learning process, we tend to give it short shrift. 4e

Here for example are a few basic skills or pieces of knowledge a beginner may need.

Use of a keyboard. New knowledge required here may range from nothing, through learning keys different from those on a typewriter, to learning normal typewriter keys.
Getting from machine to machine or software subsystem to software subsystem.
Getting help in each system.
Exiting each system, gracefully and otherwise. This is probably a part of moving among systems. 4f

All of this we already do, but not thoroughly. What I suggest is that new users be THOROUGHLY grounded in preliminary knowledge. For example, the user should have a working knowledge of the keyboard before he or she learns anything else. Next the trainee should be trained to move among systems with facility.

nextthe user should have facility in calling for help in each system and subsystem. In other words, the trainee should have a working knowledge of useful skills at all times. 4g

The idea of WORKING KNOWLEDGE is central to this memo. It is my opinion that our current training program rushes these steps too much. To some extent, perhaps to a large extent, this is unavoidable, because knowledge grows with practice. Yet when a user gets into trouble, he should be able to get out with the help commands and a little reflection on what he or she has learned before. And when a new concept is introduced, it shouldn't be necessary to break the flow of instruction by introducing another basic concept; It should be sufficient to remind the trainee. 4h

Coping With Boredom 5

There is a danger of boredom setting in if the flow of instruction is too slow. This can be just as harmful to user adoption as frustration. 5a

To a large extent, we can cope with boredom and frustration without great conflict. If we give enough preliminary instruction so that frustration is low, the user iis unlikely to be bored. 5b

But to some extent, there is an essential conflict. Frustration only builds when the user gets into trouble, and if we are skillful enough to keep him or her from getting into trouble,the trainee will not understand the need for gradual progress. I should add here, however, that from my experience, it is the trainers who are rushing the process, not the trainees. Also, I think it would be very hard to be so good that the user will not be frustrated with some regularity. 5c

This is open to debate, but I think we should err on the side of boredom, simply because the user will later need basic information badly. If we don't supply the information he will need in the first pass, we will have to do so later. When that happens, we can only do patchwork things, such as doing everything in an expanded Help software system, or constantly getting on the phone, linking terminals,and doing other klugy things. Or, we may simply lose the user. 5d

I can suggest one technique for combining the advantages of thorough grounding in basics with those of letting the user get the feeling of the system quickly in a hands on mode. This is to have a preliminary session in which the user is given just

a few basics, such as what the keyboard looks like, and is told what to do on a step-by-step basis. Since users will invariably make mistakes and not know how to correct them, this requires that the traineer look over the trainee's shoulder constantly and supply spot help, not bothering to explain what they are doing, in order tokeep the essential conceptual flow going. Perhaps each lesson should start with a run-through, then a more thorough lesson. 5e

(J25139) 17-JAN-75 14:33;;;; Title: Author(s): Raymond R. Panko/RA3Y; Distribution: /RA3Y([ACTION]) ; Sub-Collections: SRI-ARC; Clerk: RA3Y; Origin: < PANKO, TRAINING,NLS;1, >, 17-JAN-75 07:37 RA3Y ;;;;####;

DVN 17-JAN-75 16:20 25140

More references on Command Language

Some other journal items having to do with cchanges in the command language and the reasons for them: 23371, 20453, 19550, 19005, particularlly the first. 1

DVN 17-JAN-75 16:20 25140

More references on Command Language

(J25140) 17-JAN-75 16:20;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /GCE([INFO-ONLY]) ; Sub-Collections: DIRT SRI-ARC; Clerk: DVN;

DCE 17-JAN-75 17:03 25141

Letter to Bob Probst of Herman Miller re: Utility Developments

Mr. Robert Probst, President
Herman Miller Research Corporation
3970 Varsity Drive
Ann Arbor, Michigan 48104

Dear Bob:

I very much enjoyed your phone call of 9 Jan. I had found myself thinking of you more often lately, as our activities have brought us closer to the point where what we do and supply are beginning to be useable to changemakers around the country (you being one of the best changemakers that I know).

The most important development here has been the emergence of our "Knowledge Workshop Utility Service." Yesterday was its first anniversary. I think that it is a great success. The first year has taught us a lot. Our clientele are mainly people that we had had contact with over the past few years, and without our doing well at all at marketing, the growth has been all that we could handle. I figure that it is time that we began more actively to develop the kinds of exploratory application clientele that will have the highest impact. Both of the areas you mentioned sound like they fall into the high-impact category, especially the congressional-effectiveness project. Early attention to augmenting some kinds of management activities would be of very high payoff, in our value framework (which I'd enjoy discussing with you), so any possibility for getting the "knowledge-workshop" system concepts into the planning for a revolutionary new school of business administration could also be in the high-impact area.

I'll be looking forward very much to having you visit us here in Menlo Park; the sooner the better. (Bring some of your family. In any event Ballard and our kids are anxious to see you/them again.)

I am enclosing some reference literature to help you get up to date on us. Not having neat, informative brochures is embarrassing. We hope to remedy that one day. Feel very free to call, too, if that would serve your needs more efficiently than searching through our documents. I'm not just being polite; I really am hugely pleased at the prospects of any kind of future interaction with you.

Best regards,

Douglas C. Engelbart, Director
Augmenation Research Center

Enclosures:

D. C. Engelbart and W. K. English, "A Research Center for Augmenting Human Intellect", AFIPS Proceedings, Fall Joint Computer Conference, 1968, Washington, D.C. (XDOC -- 3954,) 8a

D. C. Engelbart, COORDINATED INFORMATION SERVICES for a DISCIPLINE- OR MISSION-ORIENTED COMMUNITY, paper presented at the Second Annual Computer Communications Conference, San Jose, California, 24 January 1973. (Journal, dated 12 Dec 72 -- 12445,) 8b

D. C. Engelbart, DESIGN CONSIDERATIONS FOR KNOWLEDGE WORKSHOP TERMINALS, paper presented at the National Computer Conference, New York City, June 1973. (Journal -- 14851,) 8c

D. C. Engelbart, R. W. Watson, J. C. Norton, THE AUGMENTED KNOWLEDGE WORKSHOP, paper presented at the National Computer Conference, New York City, June 1973. (Journal -- 14724,) 8d

Augmentation Research Center, "Output Processor Users' Guide," 23 Aug 73, (Journal -- 12209,) 8e

James C. Norton, "The SRI-ARC Workshop Utility Service, What and Why," ARC internal memorandum, 1 Oct 74, (Journal -- 24031,) 8f

DCE 17-JAN-75 17:03 25141

Letter to Bob Probst of Herman Miller re: Utility Developments

(J25141) 17-JAN-75 17:03;;;; Title: Author(s): Douglas C. Engelbart/DCE; Distribution: /DCE([INFO-ONLY]) JML([INFO-ONLY]) JCN([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: HGL; Origin: < ENGELBART, LPROBST.NLS;4, >, 17-JAN-75 16:25 JML ;;;;####;

KIRK 17-JAN-75 16:39 25142

Response to HGL's 25132

When the back arrow command does what it does if you type one too many "no"s in the Help command as I described in 25131, sloppy is the best adjective I can think of to describe it's implementation. It is especially cruel in TNLS. Since Harvey brought up the point of consistency, I would like to point out that the "back" function is confusing as it does not work like a straight stack forgetting places you back out of and it is also inconsistant with the NLS return ring which remembers where you last backed out of. The problem I addressed in 25131 is not mentioned in HGL's 25132. What I described occurs when the program thinks the user is trying to back off the end of the return stack. It is a very bad bug and should be fixed asap. 1

KIRK 17-JAN-75 16:39 25142

Response to HGL's 25132

(J25142) 17-JAN-75 16:39;;;; Title: Author(s): Kirk E. Kelley/KIRK;
Distribution: /HGL([ACTION]) DIRT([INFO-ONLY]) JDH([INFO-ONLY
]) ; Sub-Collections: SRI-ARC DIRT; Clerk: KIRK;

DIA 17-JAN-75 16:52 25143

Hasty notes on debugging coroutines and signals

I have been debugging the new signal stuff and have learned some worthwhile things to know when debugging coroutines and signal type stuff. I will dump here for your reference later. Also, some of this may be important for the debugger. 1

Learn about the new runtime package by reading first page of (nls,x110runtime,). 1a

Some obvious and some not-so-obvious things: 1b

Don't breakpoint a port ID! 1c

Don't breakpoint a coroutine (OR procedure) starting location. Use proc+3 and cortn+4. The mark is not setup until then and you can't look at locals etc. 1d

A good breakpoint is SYSRCV+3 which is system disaster-recover procedure. At that point, syswhy contains address of error string, sysloc contains address of error, or port id of offending coroutine. 1e

A port ID is just a mark for the coroutine instance. Observe the frame layout: 1f

argn	last arg	1f1
...		1f2
arg2		1f3
arg1	first arg	1f4
ret	return loc (or "syspop" if has invoked catchphrase)	1f5
omrk	old mark, M points here	1f6
cret	co-routine exit location	1f7
locl1	first local	1f8
...		1f9

For coroutines, RET is not return location but PORT. 1g

For both coroutines and procedures, CRET is the last PCALL exit location. Note that HELP, NOTE and ABORT are all PCALLS. So are INVOKE, RESUME, CONTINUE. While executing in a catchphrase, this cell is saved somewhere else (in signal activation frame - global cell sysgco if that signal is active - i.e. not nested). 1h

Hasty notes on debugging coroutines and signals

Given a port, you can find its last point of exit by looking in stack. Breakpoint just beyond that if you want to stop it. 1i

Be careful with PORT when coding. If you specify explicitly where to store the returning port ID, it is NOT stored in PORT -- PORT remains unchanged. If you then do a PCALL without specifying a port, you will go to PORT, not where you came from. This is useful in some cases, but watch it. 1j

STARTUP and RECOVER are REFs, don't breakpoint them. 1k

You can breakpoint CONTINUE function, by looking at syscon, which is port ID for that routine. That is a stack mark -- [syscon+1] is CONTINUE's last point of execution -- breakpoint there and you will stop at each CONTINUE. Breakpoint just BEFORE that and you will stop just before each catchphrase is activated. At that point, syscat points to catchphrase frame, which contains: 1l

catchphrase address 1l1

port id (mark) for catchphrase instance 1l2

enable count for the catchphrase instance 1l3

S at time catchphrase was invoked 1l4

return location for the procedure, or 0 1l5

termination location for the catchphrase instance 1l6

It's generally hard to find the return location for a procedure that has invoked a catchphrase. I will provide a system routine to find it later. It is in the catchphrase frame for the first invoked catchphrase for that procedure. In most cases that frame will be on top of the catch stack -- pointed to by (syscpe-6). 1m

Obviously we want a lot of help from the debugging package. 1n

The system procedure ERRMSG(jfn,why,loc) will write a nice string explaining the error problem, including reducing a port ID to a location. But its better to catch the error at sysrcv because the stack is totally reset by the time the programs' recover procedure is called. 1o

DIA 17-JAN-75 16:52 25143

Hasty notes on debugging coroutines and signals

(J25143) 17-JAN-75 16:52;;;; Title: Author(s): Don I. Andrews/DIA;
Distribution: /NPG([INFO-ONLY]) RWW([INFO-ONLY]) ;
Sub-Collections: SRI-ARC NPG; Clerk: DIA; Origin: < META,
DEBUGNOTE,NLS;2, >, 17-JAN-75 16:50 DIA ;;;;####;

DVN POOH KIRK 17-JAN-75 17:21 25144

Informal Documentation Report for Week Ending Jan 17

KIRK: 1

> user-programs help. Still being reviewed by Applications. 1a

> Discussed procedures for handling feedback concerning help. 1b

> Combined updating help conventions and procedures with the writing of the Help description-base development tool description-base. See <documentation, helphelp, >. 1c

> Reviewed POOH's help work. 1d

pooh: glossary,glossary,glossary spent alot of time locking myself out of files 2

worked with Dirk to revise the master documentation list 3

follow up on order to BBN for documentation--still waiting for reply 4

DVN: 5

Preface to NLS: Waiting for Application's Review 5a

Introduction to NLS (replacing the Howto branch of help):Waiting to be written. 5b

TNLS Addressing: It is on me to repsond to RWW's review. 5c

COM: 5d

The revised command summary awaits my attention for COM printing. 5d1

The TNLS-8 Primer awaits my attention for COM printing. 5d2

Ken Victor's paper on CML , the business cards, and Larry Day's paper "San Juan" have not returned from DDSI.. 5d3

Narrowed the list of Job applicants and gave it to Dick.. 5e

Responded to review of abstract of final report and wrote a yellow-papre draft of developement history of Help. 5f

DVN POOH KIRK 17-JAN-75 17:21 25144

Informal Documentation Report for Week Ending Jan 17

(J25144) 17-JAN-75 17:21;;;; Title: Author(s): Dirk H. Van Nouhuys, Ann Weinberg, Kirk E. Kelley/DVN POOH KIRK; Distribution: /JOAN([ACTION] dirt notebook please) DIRT([INFO-ONLY]) DVN([INFO-ONLY] x) POOH([INFO-ONLY] x) KIRK([INFO-ONLY] x) JMB([INFO-ONLY] x) ; Sub-Collections: SRI-ARC DIRT; Clerk: DVN;

JHB 17-JAN-75 18:39 25145

Responsibility for Transfering Online Documentation to Office-1

The following has been agreed to by those concerned. 1

Jeff Peters will be responsible for transfering NEW copies of the HELP data base (documentation,help,) and <USERGUIDES> to Office-1. Operators should aid in this process as much as possible (at ARC for the time being and then at Tymshare if the expertise can be tapped). 2

Kirk Kelley (Help DB maintainer) will contact Jeff when sufficient changes warrent a new version, probably not more often than once every 2 weeks, unless some major changes are made. 3

The maintainer of Userguides will inform Jeff of sufficient changes in a given file. It is important that the person transfering the files not have to chase down the changes. 4

JHB 17-JAN-75 18:39 25145

Responsibility for Transfering Online Documentation to Office-1

(J25145) 17-JAN-75 18:39;;;; Title: Author(s): James H. Bair/JHB;
Distribution: /JCP([ACTION]) KIRK([ACTION]) POOH([ACTION])
JDH([INFO-ONLY]) JCN([INFO-ONLY]) RWW([INFO-ONLY]) ;
Sub-Collections: SRI-ARC; Clerk: JHB;

DVN 18-JAN-75 23:00 25147

More on COM of Executive Summary

Your COM file has reached tape at ISI; I will call DDSI in the morning and get it to them. I will be glad to talk with you Thursday afternoon or any time Firday of next week. The following Monday (the 27th) and for the next couple of days I will probably be in Washington. 1

DVN 18-JAN-75 23:00 25147

More on COM of Executive Summary

(J25147) 18-JAN-75 23:00;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /JOAN([ACTION] dpcs notebook please) FGB([ACTION]) NDM([INFO-ONLY]) RLL([INFO-ONLY]) JHB([INFO-ONLY]) ; Sub-Collections: DPCS SRI-ARC; Clerk: DVN;

JAKE 19-JAN-75 09:39 25148

Name typin in SENDMAIL

Don't know if you know that you can do 'show record for ,NAME' in SENDMAIL. I wasn't clear about the point of your suggestion...was it being able to bug a name or just enter one? One can enter a full name if it is preceded by the dot now. However, I suspect that most users do not know that this option exists. Jake 1

JAKE 19-JAN-75 09:39 25148

Name typin in SENDMAIL

(J25148) 19-JAN-75 09:39;;;; Title: Author(s): Elizabeth J. (Jake) Feinler/JAKE; Distribution: /RLL([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: JAKE;

ex

This is a brief note on training, reflecting my experiences with training at ARC, but also drawing upon what I know about teaching theories and philosophies--which isn't much. The note is hierarchical. 1

The arguement of this note is that we need to structure our training program so that the trainee is given very thorough grounding at each step along a path that is carefully laid out along lines of explicit behavioral objectives. Two advantages are claimed. First, if this is not done, it is difficult to train users subsequently, because they will not have information needed to learn each next step. Second, if it is not done, we will be continuously innundated by trainees' calls for help, as they inevitably do things that were skipped over but which we do claim to support. 2

Setting Objectives and Assessing Knowledge 3

From my brief experience with the system, it seems that training is taking place by the "seat of the pants," that is, the trainers do not have a precise idea of what they are trying to teach at any moment in time. 3a

This has two hazzards. First, when the session ends, the trainee may not have all the skills he or she needs . The next time he or she tries to use what was just learned, an unexpected situation may arise that cannot be handled per the instructions. . This can be frustrating, It can be avoided. 3b

The second hazzard is that the trainee will stumble over lessons because he or she does not have a piece of knowledge needed to understand what is being taught. In a sense, what the trainer gains early-on by taking an informal approach may be paid for later, when the trainee has a hard time assimilating what is being taught. 3c

Frustration is a very bad thing if you don't have a captive learner. I am a little concerned that our training may be slowing down adoption in client organizations. 3d

A Proposal to Develop a Formal Lesson Plan 4

ex

I would like to propose that ARC develop a formal lesson plan. To do this we must specify learning objectives hierarchically, and also figure out what information must be learned prior to what other information, so that we can develop a linear teaching plan. 4a

To set objectives, we should first make a list of Actions that a user should be able to take, for example "send a memorandum once it has been written." A list of about seven major objectives will probably serve for the initial training session. 4b

Second, we should work back and specify exactly what a user should know before taking a lesson to learn each activity. Ideally, we would find that some entire Actions are logically prior to others. Of course a totally linear progression is unlikely. 4c

Third, we should be able to group some preliminary knowledge into Preliminary Actions that are not end objectives like writing or editing messages, but which nevertheless are critical to the learning process. 4d

This may be an Achillies Heel in our training program. At least in my experiences, the training program doesn' give enough basics that the user can learn without annoyance. Perhaps because this is not an area that will be useful after the learning process, we tend to give it short shrift. 4e

Here for example are a few basic skills or pieces of knowledge a beginner may need.

Use of a keyboard. New knowledge required here may range from nothing, through learning keys different from those on a typewriter, to learning normal typewriter keys.
Getting from machine to machine or software subsystem to software subsystem.
Getting help in each system.
Exiting each system, gracefully and otherwise. This is probably a part of moving among systems. 4f

All of this we already do, but not thoroughly. What I suggest is that new users be THOROUGHLY grounded in preliminary knowledge. For example, the user should have a working knowledge of the keyboard before he or she learns anything else. Next the trainee should be trained to move among systems with facility.

ex

nextthe user should have facility in calling for help in each system and subsystem. In other words, the trainee should have a working knowledge of useful skills at all times. 4g

The idea of WORKING KNOWLEDGE is central to this memo. It is my opinion that our current training program rushes these steps too much. To some extent, perhaps to a large extent, this is unavoidable, because knowledge grows with practice. Yet when a user gets into trouble, he should be able to get out with the help commands and a little reflection on what he or she has learned before. And when a new concept is introduced, it shouldn't be necessary to break the flow of instruction by introducing another basic concept; It should be sufficient to remind the trainee. 4h

Coping With Boredom 5

There is a danger of boredom setting in if the flow of instruction is too slow. This can be just as harmful to user adoption as frustration. 5a

To a large extent, We can cope with boredom and frustration without great conflict. If we give enough preliminary instruction so that frustration is low, the user iis unlikely to be bored. 5b

But to some extent, there is an essential conflict. Frustration only builds when the user gets into trouble, and if we are skillful enough to keep him or her from getting into trouble,the trainee will not understand the need for gradual progress. I should add here, however, that from my experience, it is the trainers who are rushing the process, not the trainees. Also, I think it would be very hard to be so good that the user will not be frustrated with some regularity. 5c

This is open to debate, but I think we should err on the side of boredom, simply because the user will later need basic information badly. If we don't supply the information he will need in the first pass, we will have to do so later. When that happens, we can only do patchwork things, such as doing everything in an expanded Help software system, or constantly getting on the phone, linking terminals,and doing other klugy things. Or, we may simply lose the user. 5d

I can suggest one technique for combining the advantages of thorough grounding in basics with those of letting the user get the feeling of the system quickly in a hands on mode. This is to have a preliminary session in which the user is given just

ex

a few basics, such as what the keyboard looks like, and is told what to do on a step-by-step basis. Since users will invariably make mistakes and not know how to correct them, this requires that the trainer look over the trainee's shoulder constantly and supply spot help, not bothering to explain what they are doing, in order tokeep the essential conceptual flow going. Perhaps each lesson should start with a run-through, then a more thorough lesson. 5e

RA3Y 19-JAN-75 12:18 25149

ex

(J25149) 19-JAN-75 12:18;;;; Title: Author(s): Raymond R. Panko/RA3Y; Distribution: /RA3Y([ACTION]) RA3Y([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: RA3Y; Origin: < PANKO, TRAINING.NLS;1, >, 17-JAN-75 07:37 RA3Y ;;;;####;

JBP 20-JAN-75 09:59 25150

Clarification of append problem

Kelley informs me that there is no user prog named append but there is a left over piece of code in dir user-progs called append that was used with nls 7, that was what i had got a hold of, sorry to have troubled you,
--jon.

1

JBP 20-JAN-75 09:59 25150

Clarification of append problem

(J25150) 20-JAN-75 09:59;;;; Title: Author(s): Jonathan B. Postel/JBP; Distribution: /FEED([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: JBP;

JHB 20-JAN-75 10:16 25151

USER DEVELOPMENT REPORT: TRIP TO THE EAST COAST, DEC. 74

The following trip report lists users contacted and trained at respective user sites plus brief comments on the NLS course material covered, assistance given, issues raised, client applications, and workshop development.

USER DEVELOPMENT REPORT: TRIP TO THE EAST COAST, DEC. 74 1

The following trip report lists users contacted and trained at respective user sites plus brief comments on the NLS course material covered, assistance given, issues raised, client applications, and workshop development. 1a

(UPPER CASE indicates directory at Office-1). 1a1

BRL, Aberdeen, MD (2 mandays) 2

Stan TAYLOR, Architect -- attended all courses at BRL and AMC, Wash 2a

Jim Moran - administrative 2b

George Samos - administrative 2c

Alice Sandusky - clerical 2d

Ana Long - clerical 2e

COURSE: 2f

Basic Course completed in 1.5 days with the resultant capability to enter and correct (substitute) errors, a familiarity with move and copy statement, show directory, Journal interrogate submission, sndmsg, and file loading and updating. 2f1

The remaining half day was used to introduce structure and viewspecs as part of the print commands. Structure elements were limited to statement, branch and group. 2f2

Entry to the Net through ANTS caused some consternation due to 3 or 4 crashes and extra commands to establish a connection. The "classroom" contained a TI terminal and 3 Hazeltine 2000 displays in UPPER case only. This posed some difficulty, but at an introductory level, the problem was minimal. Setting viewspecs required setting Tenex to interpret lowercase only. This was necessary due to the continued set up of directories without default parameters: m viewspec and partial prompting. 2f3

APPLICATION: 2g

BRL's local application is not developed yet due to the lack of readily available terminals (those available are quite a distance from the potential user's offices) and time /energy limitations of the architect who is deeply involved as an

advisor to the Chief of BRL. An "assistant architect" is needed (perhaps Don Taylor?). 2g1

AMC- MIS Directorate, AMC Hdqtrs (NEW client) (BRL, 1 manday), 3

5001 Eisenhower Ave., Alexandria, Virg. 22304 Wash DC 3a

Alma J Lewis - AMC-MIS systems group, support programmer 3b

Ed Van Garen -AMC- MIS Director's Office, Senior systems Analyst 3c

Fred A. Biederman - AMC-MIS Systems Analyst, (202) 274-8344 3d

(The 3 forgoing individuals also attended the course at BRL (TDY from Wash.) 3d1

John GILBERT, AMC-MIS Division Director (GS17) 3e

Dr. Ron UHLIG, Chief, Scientific and Management Information Division 3f

Col J D SMITH - Chief, ALMSA(Automated Logistics Management Systems Agency), Army Materiel Command, St. Lewis, Mo. 3g

Herb S. MITCHELL, Chief, LSSA (AMCMS-E) 3h

John CIANFLONE, Chief, Army computer Support, (AMCMS-T) York, Pa 3i

In charge of computer operations and funding for acquisition, 3i1

Art Brown - Observer, MIS directors office 3j

COURSE: 3k

Basic Course completed in 1 day with the resultant capability to enter text and correct (substitute) errors, a familiarity with move and copy statement, show directory, Journal interrogate submission, sndmsg, and file loading and updating. 3k1

Structure and viewspecs were introduced those who had previous experience with the Net, and were comfortable with this kind of technology. Structure elements were limited to statement, branch and group. 3k2

APPLICATION: 3l

AMC is looking for a system to facilitate dialog and document transmission among the distributed sites that are coordinated under the MIS directorate. The initial capability would serve

the MIS directorate's practical needs, but my impression is that it would also serve as the prototype for a communication network for the widely dispersed facilities that make up the AMC. It reminds me a little of COTCO, but at a more sophisticated level. 311

Subsequent to this visit, Dr Uhlig expressed a serious interest in acquiring his own slot (currently using BRL's slot with 10K of their s). I was particularly impressed by this potential AKW due to the the high level of those willing to gain hands on working knowledge of the system (GS17 Directorate Chief). 312

NSA, Md. (1 manday) 4

Jesse HILL, Architect ? 4a

Keith MCCLOTHRIE, Architect? 4b

Terry Proch - analyst 4c

Mike Robertazzi- analyst 4d

Steve Noga - hardware engineer (build LPs in-house?) 4e

Mil E Jernigan - (special consultant, Mitre) wants to have access and be on the distribution for FRPs, etc. 4f

ASSISITANCE: 4g

Assistance consisted mostly of "hole filling" in knowledge about NLS. Particular emphasis was on process commands file protection (had to explain that Set Tenex protection did not work), addressing, in partcular, markers, name external, and content patterns in links. Keith and Jess were primary "students", advanced intermediate users through some prior net experience (NIC access) and a 3 day course in Nov by SRL. 4g1

APPLICATION: 4h

NSA is devoting the current year to gaining NLS experience to provide the expertise for running NLS on one of their PDP 10s. They wish to persue CML and L10, and in fact Keith seems well on the way (programming in CML). NLS in-house will serve as a secure front end and communication handler for an NSA ARPA Net, totally in-house, linking together their vast computer resources. Target date for NLS in-house = Jan 76. 4h1

NSRDC, MD. (.5 manday) 5

JHB 20-JAN-75 10:16 25151

USER DEVELOPMENT REPORT: TRIP TO THE EAST COAST, DEC. 74

Frank BRIGNOLI, Architect 5a

Mike CHERNICK - engineer 5b

Roger MARTIN - engineer 5c

Larry AVRRUNIN - engineer 5d

Herb ERNST - engineer, manager 5e

ASSISITANCE: 5f

Noted some blocks in use of NLS, and explained as well as answered questions. RLL joined in afternoon meeting. 5f1

APPLICATION (2 slots) 5g

Frank has good hopes to get a third slot by July 75. 5g1

They are currently using the utility for several large reports, hence the need for printer and bulk input. 5g2

ISSUES (some serious impediments to development): 5h

NSRDC would very much like to use DEX but understands that it cannot be used at present with the network due to TIP buffers that are too small (most people type fast enough with one finger to cause characters to be dropped). Unless buffer problem disappears bulk typing is undesirable. Most users are writing longhand for a secretary to enter into NLS. 5h1

NSRDC needs a printer for local, clean output, as do most sites. 5h2

Difficulty is experienced due to the number of ports into TIPs. The Mitre TIP quickly gets filled in the morning and the NBS TIP has a small number of available ports. 5h3

ETS, Princeton (1,5 mandays) 6

Dave POTTER - PHd Psychology (speciality is educational psyc, Cornell) 6a

ASSISITANCE and special note: 6b

Dave had picked up an intermediate-advanced level of NLS usage in 2 months without formal training, using the Help system, questionmark, some local assistance from previously trained

people, extensive linking with Office-1 staff, and heavy use of sndmsg to FEEDBACK. 6b1

Assistance on this trip took the form of filling in gaps in NLS which is probably the most difficult of user assistance tasks. Covered such areas as TNLS addressing, markers, external names, content patterns, Journal options, and process commands. 6b2

The 1.5 day visit covered as much of the AKW technology as possible without a specific application other than local document preparation for Dave. Other users were not supported due to the eminent termination of the contract. However, subsequent to this visit, Dave was instrumental in getting ETS to buy 50% of the service while ARPA increased their support from a planned 0 level to half a slot. 6b3

HUDSON Institute, NY (1 manday) 7

Ruddy Ruggles: Architect, but recently assumed the position of Executive VP for Hudson along with being Chief Scientist(?). 7a

DISCUSSIONS: 7b

Revolved around the general application, and the difficulty of accessing the Rutgers TIP through voice grade phone line -- it has essentailly been prohibitive to the operation of DNLS. Extensive effort by Applications Hardware Group is on the road to clearing up the problem. 7b1

Mary GIACOBINO: Administrative/research assistant 7c

ASSISTANCE: 7d

Due to the phone problem, decided to encourage the use of TNLS. However, after experiencing the use of DNLS, even wrought with serious noise problems, TNLS looked very unattractive. Primary cause was noted to be the complex addressing in TNLS and the sort of "blindness" that follows the fast-viewing movement of a display. Emphasis was placed on the use of links in ditributed data base structuring during the 1.5 day visit. 7d1

Susan Rouhrbaugh: Executive Assistant 7e

Attended some of the sessions with Mary; involved to a lessor extent, particularly due to move with Ruddy as his Executive Assistant (my words). 7e1

APPLICATION: 7f

USER DEVELOPMENT REPORT: TRIP TO THE EAST COAST, DEC. 74

Current major application is a distributed, structured data base interlinked for pre-specified viewcontrol. The database is most facinating; a scenerio -prognoses for world economic, social, and political conditions. Known as the Hudson Inst. Standard World, it is in a softback, "visual aids" page form, currently high quality printed. "Charts" are refered to by number in a "commentary", which very often appear on opposing pages. The charts usually are on a foldout, that may be viewed while reading the commentary. The charts contain point-by-point, clear summary statements that are causally related within a subject area. 7f1

This ideal application for NLS's link controlled viewing may be eventually used for TV projection during Hudson's seminars for government and corporate leaders! 7f2

MIT Lincoln Labs, Seismic Descrimination Group (1.5 mandays) 8

Bob Sheppard - Architect 8a

ASSISTANCE 8b

Worked on Output processor directives, useroptions, and process commands. Dealt with serious problem in Output Processor, that of controlling page length. Their DEC Thermal printer has odd page size in both lines and inches. Found that LMax diective does not control page length but that a combination of BM and LMax provides some control. The effect of Useroptions on printer was also explored. 8b1

Sue Swim, clerical 8c

Usage limited to text entry. Planned to have IBM Mag Card interface with Net for high quality output and standard keyboard input. Net not capable of handling mag card input. 8c1

APPLICATION: 8d

The Integrated Worldwide Seismic system (IWWSS) is widely distributed, with seismic stations and processing centers world over using various large scale data processrs and data stores. NLS is proposed to be used by many of the stations and research groups who need to have access to a common data base and communication facility through the Net. 8d1

Bob is setting up data base design papers for the Intergated Worldwide Seismic System Documentation that are structured to enable a naive user to get the information necessary to peruse, add to or build such data bases about personnel resources and

contacts, project schedules, meetings (dates,announcements, agendas, etc.), data availability profiles, research services, processor descriptions, IWWSS internal operations, seismic activity and research in the area of geophysics. 8d2

NLS process commands are being tried as a way of displaying instructions and information to non-NLS users. For example, a startup branch prints instructions and tables of contents for a user logging into IWWSS. Links with filters are set up to be selected to display or print certain information regarding, say, a particular site. 8d2a

Many of the comments are very brief, particularly those about applications. More information is available including hardcopies of the Hudson Reports. I'd appreciate any feedback or questions particularly from the development staff. 9

Links to info for directories to be set up if requested by BRL. 9a

(GJOURNAL, 31469, 1:w) (GJOURNAL, 31468, 1:w) (GJOURNAL, 31466, 1:w) (GJOURNAL, 31465, 1:w) (GJOURNAL, 31464, 1:w) (GJOURNAL, 31463, 1:w) (GJOURNAL, 31461, 1:w) (GJOURNAL, 31462, 1:w) (GJOURNAL, 31460, 1:w) .9a1

JHB 20-JAN-75 10:16 25151

USER DEVELOPMENT REPORT: TRIP TO THE EAST COAST, DEC. 74

(J25151) 20-JAN-75 10:16;;;; Title: Author(s): James H. Bair/JHB;
Distribution: /JCN([ACTION]) SRI-ARC([INFO-ONLY]) UD([
INFO-ONLY]) ; Sub-Collections: SRI-ARC UD; Clerk: JHB;
Origin: < BAIR, DECTRIP.NLS;8, >, 20-JAN-75 10:11 JHB ;;;; ####;

RLL 20-JAN-75 10:22 25152

Draft of coordinating procedures

comments and suggestions welcomed.

RLL 20-JAN-75 10:22 25152

Draft of coordinating procedures

Information gathering 1

A guiding principle should be that the source of information should not have much overhead in providing information to the coordinator. With this goal in mind, the burden of organizing data for storage, including any preprocessing, must be done by the coordinator (or designated helper). 1a

Accordingly, we have a central mechanism for reporting bugs, suggestions, requests, and complaints about the system itself -- called FEEDBACK. 1b

In a similar manner, I suggest we have a central directory and ident for sending coordinating information on trips, visits, phone calls, notices of upcoming conferences, vacation schedules, etc. for ARC staff members. At the moment I will call this COORD as the ident and COORDINATOR as the directory. For simplicity it might be nice to have both as ident. 1c

Also included in the items that should be sent are schedules of pending trips, reports of trips, minutes of meetings. 1d

Any handwritten notes will be transcribed by a typist for online recording. One all encompassing form will be available for staff members to use for recording information via online or hardcopy form. 1e

A "real" mailbox will be set up in a convenient place so that any staff member can submit hardcopy reports. This should be an easy method of submitting so that those who are unable or unwilling to send things online can do so. 1f

For those who prefer and where appropriate (e.g, minutes for a meeting) a recording secretary will be designated to take notes. 1g

It will be the policy that if no written report is expected to be made a recording secretary will be present at any debriefing to other staff members. If no debriefing is planned, a special one should be given to a secretary for the purpose of recording data. 1h

Uses of information 2

The data collected will enable all to know the pending and past schedule of staff members. 2a

It will help prevent conflicting demonstrations. 2b

The scheduling of meetings will be easier. 2c

The database will show where staff members are on travel so they can be contacted if needed. 2d

A central record will be kept of all visitors and contacted people. 2e

The entire mechanism will provide one way of studying the technology transfer problems. 2f

It will also be an excellent example of an application of our technology. 2g

Hopefully, the information will help in getting additional funding for our research and development efforts as well as the utility. 2h

RLL 20-JAN-75 10:22 25152

Draft of coordinating procedures

(J25152) 20-JAN-75 10:22;;;; Title: Author(s): Robert N. Lieberman/RLL; Distribution: /DCE([ACTION]) ; Sub-Collections: SRI-ARC; Clerk: RLL;

JBP 20-JAN-75 12:29 25153

Batch Job Model in NSW

Bill:
Here is commented version of your message on batch jobs. Following these comments is a description of my model for batch jobs in the NSW. The main differences are in the break down of functions to particular processes (wm, fe, grammar, tool, etc.), and in which processes touch which kinds of files.
--jon. 1

Comments on your message: 2

Date: 12 JAN 1975 1136-PDT
From: CARLSON at OFFICE-1
Subject: batch tools 2a

< CARLSON, BATCH-TOOLS.NLS;2, >, 12-JAN-75 11:26 WEC ;;;; 2b

I have a simplified model of batch tools which I use to make decision. 2c

%% How does this model compare with the model presented in the documents RJE-MODEL, and BJP by Postel and the notes by Warshall and Millstein ? %% 2c1

%% What decisions ? %% 2c2

%% It would be very helpful to have your comments keyed to the previously distributed documents. %% 2c3

Plase evaluate the model and, by 16 Jan 75, send a message indicating agreement or identify pitfalls in the model by describing scenarios where it fails, and propose SIMPLE revisions which resolve the pitfalls 2d

%% Should this suspend progress on the implementation of NSW ? %% 2d1

A batch job cannot communicate with the user during execution. 2e

%% Is this a definition or an attribute of batch jobs shared by other types of jobs ? %% 2e1

%% Millstein defined the terms BATCH, DETACHED, AND INTERACTIVE in a useful way, lets use his definitions. %% 2e2

Background jobs on Multics or other time-sharing systems qualify as batch jobs. 2f

%% Does "background" include TENEX Detatched Jobs ? %% 2f1

Batch Job Model in NSW

The following classes of batch jobs are of interest: 2g

Predefined NSW Tools: allow a user talking to the Works Manager to say the logical equivalent of "execute TESTDATA using CRITERIA as input and producing MONTHLY as output," CRITERIA and MONTHLY are NSW files. Optionally, the user might specify a host, ie "execute TESTDATA at UCLA91". 2g1

%% "Predefined" is a new term to me perhaps a further explaination would be helpful, I take it to mean that it is a program that has been made known to the Works Manager as a tool and has a grammar. %% 2g1a

%% Which 360 should we be getting up to speed on NSW/PCP -- RAND or UCLA ? %% 2g1b

The WM will know whether the TBH requires all files to be resident before a batch job is submitted, or if it supports delayed staging of files. If files must be prestaged, the WM will move or create the files and remember the local names. 2g1c

%% Perhaps the works manager dosent need to know this but the batch job package can take care of fetching the required files. %% 2g1c1

%% The idea of prestaging vs delayed staging of files is what distingishes BATCH and DETACHED tools in Millstein's document, lets use one set of definitions. %% 2g1c2

The WM will know the local name of the tool. It will send a message to the TBH of the form "run Local-Tool-Name on Local-File-1, Local-File-2, NSW-File-3 producing Local-File-4 and NSW-File-5 using TEXT-ARG-1,TEXT-ARG-2," 2g1d

%% This assumes that it is easy to distinguish local (to what) filenames from NSW filenames -- i for one don't buy that assumption. Although i do agree that the probability of confusion can be greatly reduced by a sutiable prefix name for all NSW file names. %% 2g1d1

%% By now everyone should think in terms of Procedure Call Protocol. The procedure call your "message" maps into is defined in the Batch Job Package (BJP) and is named CRTJOB. 2g1d2

CRTJOB (infiles, outfiles => jobid) 2g1d2a

The files in the lists infiles and outfiles are filenames that can be handled by file packages, the batch job

package calls on a file package either in the same TBH or another TBH to get the files for input or store the result files. %% 2g1d3

If the TBH does not support delayed staging, then of course there will be no NSW files in the list. Note that since this message is in an NSW format, we should easily be able to mark local file names, NSW file names, and textual arguments. 2g1e

%% By "in NSW format" do you mean it is a PCP Call ? %% 2g1e1

One implementation (not only one) would have the local tool name be a text file or catalogued procedure. The Foreman component in the TBH would ask the WORKS MANAGER for a correct local name corresponding to each NSW Filename (if there is delayed staging of files). The local filenames and the textual arguments would be substituted into the control file, which would be given to the standard scheduler to be executed at its convenience. The only uses I have thought of for textual arguments thus far are run time parameters like core size, time limit, priority, etc. 2g1f

%% What is the "Foreman component" ? Perhaps this is the role of the Batch Job Package ? %% 2g1f1

%% The textual arguments you suggest are already handled in every case we know of by parameters in the control file required by the batch processing facility, why should this aspect of host specific job control be replicated in the general purpose batch job package ? %% 2g1f2

%% These "textual arguments" could be accepted from the user by the grammar driven front end, which calls on a simple procedure to edit the control card file by substituting the arguments for place holders. %% 2g1f3

The TBH must provide the WM with a job ID. The WM must be able to get job status information for a given JOBID. 2g1g

%% See the CRTJOB and STSJOB procedures specified in the Batch Job Package. %% 2g1g1

The TBH must signal the WM whenever a job terinates. 2g1h

%% An interesting point. To do ths the Works Manager must provide a procedure that a batch job package may call when a job terminates. %% 2g1h1

RESPONSIBILITIES 2g1i

COMPASS- define language for invoking tools(the WM command language), provide tool for defining other tools to the WM (CML is part of it, but I don't think all of it), Provide a document telling how to define tools. It must identify options with regard to numbers and attributes of input & output files, checking of textual arguments, optional files, warranties, etc. 2g1i1

TBH Installer- provide a mechanism for accepting WM messages and invoking tools, 2g1i2

%% Shouldn't "a mechanism for accepting WM messages" be a "mechanism for accepting and making PCP Calls", %% 2g1i2a

Create ident/jobid/account card with info sent by WM, 2g1i3

%% This card is generally the first card in the control card file which is required by the batch processing facility. This info should be sent in the control file which is one of the infiles in the CRTJOB call to the batch job package. %% 2g1i3a

Provide for status probing, signal WM when tools complete, 2g1i4

%% See the batch job package %% 2g1i4a

provide a reasonable way to send output reports onto the ARPANET, 2g1i5

%% I think this is a call for a reformatting program to make line printer oriented output presentable on display and teletype terminals. %% 2g1i5a

Provide a document telling how to install additional tools on that machine. 2g1i6

General Issue: How does the WM know how much space to allocate for output files? COMPASS to take responsibility for formulating and documenting some reasonable answer. 2g1i7

%% How does anybody know ? %% 2g1i7a

Sequences of NSW Batch Tools: One can envision jobs consisting of several "standard" NSW batch tools to be run in succession on the same TBH. On many hosts, the scheduling algorithm will

make it advantages to have the sequence lumped into a multi-activity job. Yet the WM should know when each activity completes, and have some options with regrard to file disposition and conditional tool invokation. Passing files between activities may also necessitate control stream changes. 2g2

%% Why should the works manager notice the jobstep completion for multistep one host jobs ? It may be very difficult to get access to this information in any case. %% 2g2a

Responsibilities: UCLA should take the lead in resolving these issues, with inputs from COMPASS and all TBH installers. 2g2b

"Perfect" Batch Control Streams: contain only local file names. We want to discourage these in the NSW, but must provide the capabiltiy so users don't have to leave the NSW just to type in a few simple control cards and run a batch job on their own machine. All the TBH must do is append the ident/jobid/account into to the control stream and retrieve status and output. 2g3

%% It would be easy for a NSW user to create a file (either with a special tool or with any text editor) that contained control cards and file names specific to a particular batch processing facility. %% 2g3a

Responsibilities: 2g3b

COMPASS: WM must accept a command like "run file at place", move the file, signal TBH to invoke it 2g3b1

%% BY "file" are you now refering to a control file ? %% 2g3b1a

TBH Installer: responsible for start-up, status and output reporting. 2g3b2

Batch Control Streams Containing NSW Filenames: 2g4

The user builds a job control stream ready to run, except he wants to refer to files by NSW names. In general case, would also want to be able to defer file movement(not this year). Solution to delayed staging of files should use same TBH features as for predefined NSW Tools. 2g5

Responsibility 2g5a

SRI: build an interactive tool which works on typewriter

terminals as well as displays and replaces NSW filenames with LOCAL names. Eventually, will instead simply identify some of the names as NSW names and will also be able to handle priority etc. After the substitutions are complete, the tool will invoke the WM to initiate the job 2g5a1

%% There could easily be a tool that asisted users in replacing NSWfilenames by filenames local to a particilar batch processing facility, this would be useful in preparing the control files for a program developed in the NSW to be turned over for use outside the NSW. %% 2g5a1a

%% This aside on typewriter terminals and display terminals is out of place and shows a lack of conviction that the front end will provide means to use a range of terminal classes to use the same tools. %% 2g5a1b

COMPASS and TBH Installers are responsible for providing the same capabilities as for "perfect" batch control streams and (eventually) as for NSW defined tools. 2g5a2

%% The user wants a nsw-wide control file that is like the existing host specific control files but allows each job step to be executed on a different host. The user can construct such a file with any text editor or perhaps a special control file construction tool. When the user wants to have this control file "executed" a tool is called upon to translate (by calling on the works manager) the nsw filenames to file package file names and to call the appropriate batch job packages for each job step. %% 2g6

------- 2h

Description of my model: 3

Here is a scenario of use of a batch tool which is an elaboration of the discussion contained in the RJE-MODEL document. 3a

Note that there are two case for batch jobs in the NSW: one is the traditional batch processing facility which normally expects as its primary input a control card file; the other is an interactive time sharing system which allows input to come from a file instead of interactively from a user at a terminal. 3a1

MODEL 3b

Batch Job Model in NSW

First we discuss the entities involved in the process of composing a batch job, having it run, and examining the results. 3b1

The principal entity is a batch processing facility. This is expected to be an existing hardware & software unit that will be only minimally changed to interface to the NSW. 3b1a

Examples of batch job proocessing facilities are the B4700 and the IBM 360. 3b1a1

Another type of batch job capability is is the TENEX runfil or the Multics execom facility. 3b1a2

The NSW talks to the batch processing facility via a Procedure package called the Batch Job Package (BJP). 3b1b

The batch job package in a sense referees the flow of information between its PCP callers and the batch processing facility. For example the batch job package colects all the input files that are resident on other hosts before turning the job over to the batch processing facility, and the batch job package may distribute the result files to other hosts when the job is completed by the batch processing facility. 3b1b1

The Batch Job Package interacts with File Packages (FP) to effect the movement of files to and from the Batch Processing Facility. 3b1c

The call on the batch job package to get a job submitted to a batch processing facility is: 3b1c1

CRTJOB (infiles, outfiles => jobid) 3b1c1a

The files referenced in infiles and outfiles are named so that the batch job package can get them from and put them into the directories owned by NSW at various hosts and manipulated by file packages. Thus these files are named by "file-package-filenames". 3b1c2

The user sees only NSW-filenames so there must be a language/grammar that controls the users interaction which results in the generation of a create job call on a batch job package. This processing for the user must include the mediation of the NSW-filenames the user supplies into the file-package-filenames included in the create job call. 3b1c3

The files themselves are created and examined using the text editors (e.g. NLS) available in the NSW. 3b1d

Some files that are included in a create job call may be standard library files and from the users point of view part of the system. The user may not even be aware of their existence since their names could be supplied by the grammar internally. 3b1d1

The input files are probably in most cases job control files in a particular batch processing facilities specific job control language. There might be grammars/tools to aid the user in constructing such control files for specific batch processing facilities and applications programs. 3b1d2

A scenario for a user creating, submitting, retrieving, and examining a batch job follows: 3b2

The user interacts with the front end. The front end contains a command language interpreter that is driven by a grammar. The particular grammar in use for this user at any time depends on which tool the user is accessing. 3b2a

The user interacts with an editing tool to create a source program and to concatenate it with a standard file of job control information particular to the Batch Processing Facility to which it will be submitted. The concatenation is accomplished using regular editing commands (not batch specific commands). 3b2b

The user then interacts with the Works Manager and the Batch Job Package mediated by a grammar to submit the file he has created. The grammar and the Batch Job Package will require enough information from the user that the Batch Job Package can retrieve the input files from File Packages, and store the output files. The Batch Job Package will return an identifier for this job which can be used to request status information at a later time. 3b2c

Some of the information needed to run a batch job could be in a standard file that the user always appends his file to, OR this type of information could be in a separate file that is included by the grammar in the create job call automatically, and the grammar could call on a function to edit a standard file to contain user and run specific parameters such as user-name, priority, run-time-limit. 3b2c1

When the job has been processed the user may use an editing tool to examine the output file. Note that the output files have been stored as specified in File Packages and are thus accessible to tools as permitted by the Works manager. 3b2d

It may be necessary to construct special tools to reformat the output of other tools for presentation on the users terminal. 3b2d1

In particular the tools which were designed to ouput to line printers will produce output difficult to view adaquately on narower display and teletype terminals. 3b2d1a

A discussion of a batch program as a tool. 3b3

An applications program which lives on a batch processing facility can be made into a tool in the NSW such that the users of it as a tool do not need to know the control language of the facility where it lives. To do this the tool installer must create a control card file and a grammar which are stored in the Works Manager under the toolname assigned to this program. 3b3a

When the user accesses the tool the front end gets the grammar from the works manager and follwes it to collect the prameters from the user. Once all the arguments are collected the front end (or the works manager) can call the batch job package. Note that one of the arguments is the name of the control card file. This argument may be built in to the grammar or supplied by the works manager. 3b3b

A discussion of multi-host batch jobs. 3b4

Suppose a user wanted to run a series of batch jobs steps where each step was to be carried out on a different host. It is not difficult to envision a NSW-batch-control-language in which one could say things like: 3b4a

"If the previous job step was successful then use its output file WALDO appended to control file DOITTOIT as card input to the batch processing facility ABC and call the printer output file GEORGE". 3b4a1

This requires a tool to "execute" files of this NSW-batch-control-langauge to be written. 3b4b

JBP 20-JAN-75 12:29 25153

Batch Job Model in NSW

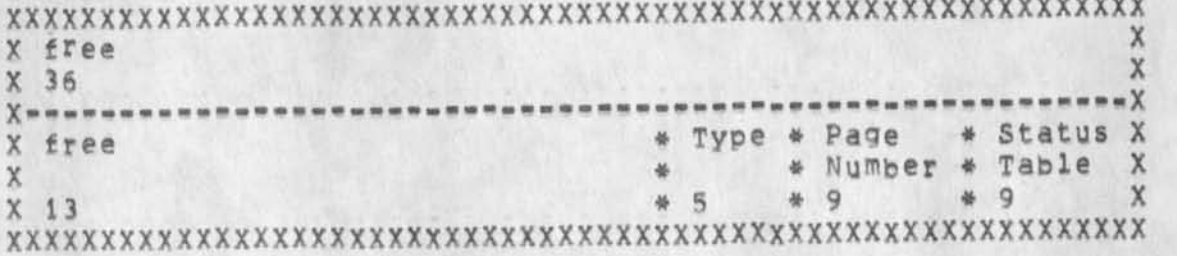
(J25153) 20-JAN-75 12:29;;;; Title: Author(s): Jonathan B. Postel/JBP; Distribution: /SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: JBP; Origin: < POSTEL, BATCH-JOB-MODEL,NLS;6, >, 17-JAN-75 15:24 JBP ;;;;####;

New NLS File Structure

GENERAL ORGANIZATION 1

PAGE HEADER 1a

PAGE HEADER BLOCK



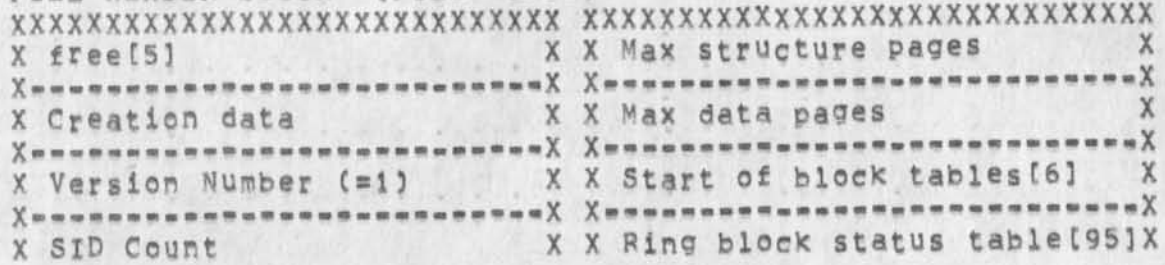
1a1

```
(fileblockheader) RECORD %fbhdl is length%                          1a2

   fbnull[36],    %unused%                                          1a2a

   fbind[9],    %status table index%                                1a2b

   fbpnum[9],   %page number in file of this block%                 1a2c

   fbtype[5];   %type of this block                                 1a2d

      hdtyp   = header                                             1a2d1

      sdbtyp  = data                                               1a2d2

      rngtyp  = ring                                               1a2d3

      jnktyp  = misc (such as keyword, viewchange etc.)%           1a2d4
```

1a2d5

FILE HEADER PAGE 1b

FILE HEADER BLOCK (FULL WORDS)




```
                                                                    1b1

%...file header...%                                                 1b2

   % DONT CHANGE THE ITEMS IN THE HEADER %                          1b2a

   filhed[5],                                                       1b2b

      % these extra words may be taken for additions to header%     1b2b1

   fcredt,    % file creation date %                                1b2c

   nlsvwd = 1,    % nls version word (keyword) %                    1b2d

   sidcnt,    %count for generating SID's%                         1b2e

   finit,     % initials at last write %                           1b2f

   funo,      % user number (file owner) %                         1b2g

      %if <0, RH is pointer to string in fileheader%               1b2g1

   lwtim,     % last write time %                                   1b2h

   namdl1,    % left name delimiter default character %             1b2i

   namdl2,    % right name delimiter default character %            1b2j

   rngl,      % upper bound on data ring file blocks %              1b2k

   dtbl,      % upper bound on data file blocks %                   1b2l

   rfbs[6],     % start of random file block status tables %        1b2m

   rngst[95],  % ring block status table %                         1b2n

   dtbst[370], % data block status table %                         1b2o
```

```
    mkrtxn = 20,   % marker table maximum length %                    1b2p

    mkrtbl,     % number of markers in marker table %                 1b2q

       %each marker takes MKRL words%                                 1b2q1

    mkrtb[20],  % marker table %                                       1b2r

    filhde,   %end of the file header%                                 1b2s

                                                                       1b2t

BLOCK STATUS TABLE ENTRIES (STRUCTURE OR DATA)
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X    * Page index else * Free    * Used  *    * Part-*ExistX
Xfree* =0 if not in    * pointer * word  *free* ial  *  ?  X
X    * core            *   or    * count *    * copy?*     X
X    *                 * count   *       *    *      *     X
X 3  * 9               * 10      * 10    * 2  * 1    * 1   X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                                                                       1b3

(rfstr) RECORD % Random file block status record, (=0 then
unallocated, else one of the following records),%
                                                                       1b4

    rfexis[1],    %true if the block exists in the file%               1b4a

    rfpart[1],    %true if block comes from partial copy%              1b4b

    rfnull[2],    %unused%                                             1b4c

    rfused[10],   %used word count for the block%                      1b4d

    rffree[10],   %free pointer for the block%                         1b4e

    rfcore[9];    %0 then not in core, else page index%
                                                                       1b4f

    % The table RFBS is broken into two sections each of which
    contains a block a records of the above type.  The first
    section includes RNGM entries from RFBS[RNGBAS] up to and
    including RFBS[RNGBAS+RNGM-1] and contains information about
    the ring blocks in the file.  The second section includes
    DTBM entries from RFBS[DTBBAS] up to and including
    RFBS[DTBBAS+DTBM-1] and contains information about the data
    blocks in the file.  The entry RFBS[RNGBAS+i] may also be
    referenced as RNGST[i]; likewise RFBS[DTBBAS+i] may be
    referenced as DTBST[i].  The index in RFBS of a block is the
```

actual page number of the block in the file, %

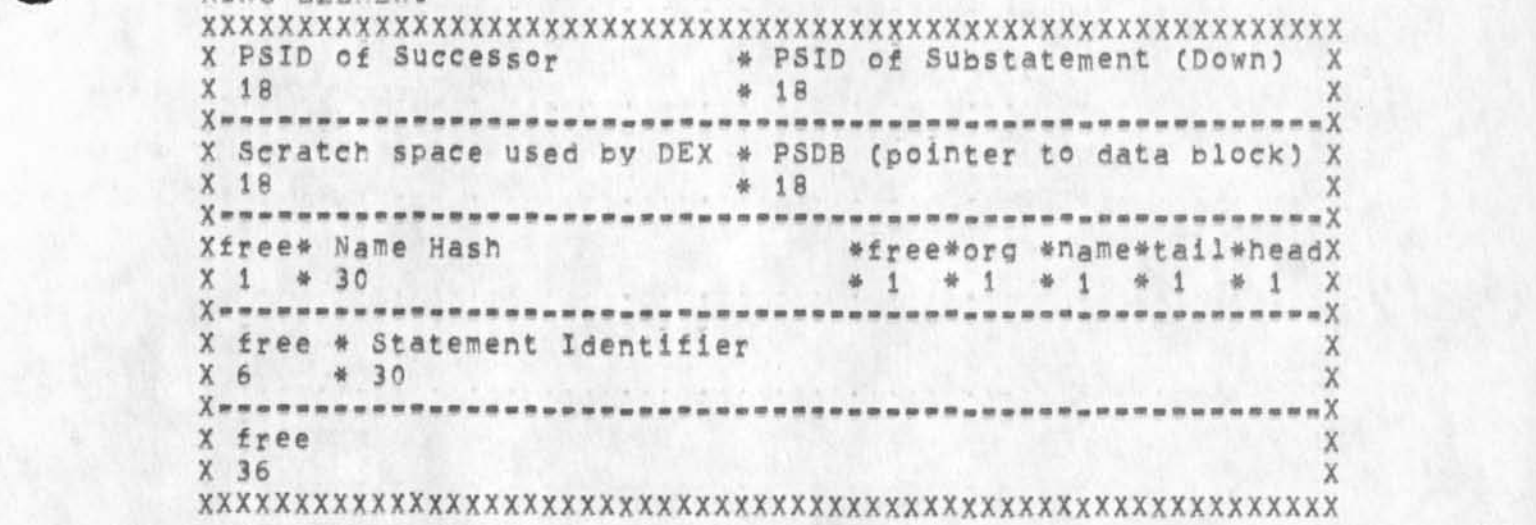
1b4g

% Data blocks are allocated in the file starting with page DTBBAS. Up to DTBM data blocks may be allocated, with data blocks given internal numbers from 0 to DTBM-1. The array DTBST in the file header is the data block status table and contains a one word record for each potential data block. A zero entry means that the block does not exist in the file, otherwise the entry is as described in the above record defintion. A pointer to an SDB (PSDB) consists of a nine bit data block number in the range [0,DTBM) and a nine bit displacement from the start of the block. The variable DTBL is maintained in each file header as the current upper bound on allocated data blocks for that file. This is used to limit the search for a location for a new SDB. The variable DTBLST contains the index of the block from which an SDB was last allocated or freed. %

1b4h

STRUCTURE PAGE (RINGS)

1c



1c1

(ring) RECORD %ringl is length% 1c2

rsub[18], %psid of sub of this statment% 1c2a

rsuc[18], %psid of suc of this statement% 1c2b

rsdb[18], %psdb of sdb for this statement% 1c2c

```
    rinst1[7],   %DEX interpolation string-- scratch space%          1c2d
    rinst2[7],   %DEX interpolation string-- scratch space%          1c2e
    rdummy[1],   %DEX dummy flag-- scratch space%                    1c2f
    repet[3],    %DEX repetition-- scratch space%                    1c2g
    rhf[1],      %head flag, true if this is head of plex%           1c2h
    rtf[1],      %tail flag, true if tail of plex%                   1c2i
    rnamef[1],   %name flag, true if statement has a name%           1c2j
    rtorgin[1],  %inferior tree origin flag, true if origin%         1c2k
    rnull[1],    %unused%                                            1c2l
    rnameh[30],  %name hash for this statement%                      1c2m
    rsid[30];    %statement identifier%                              1c2n
    %although only need four words, use five so that have room       1c2o
    to grow%
                                                                     1c2p
```

DATA PAGES

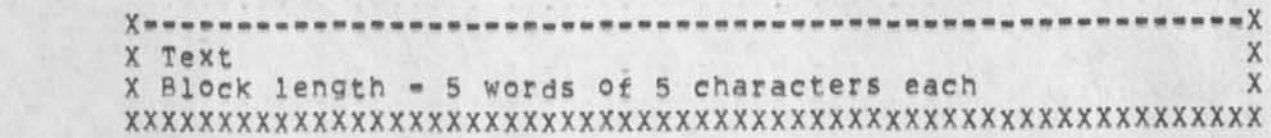
1d

DATA BLOCK HEADER

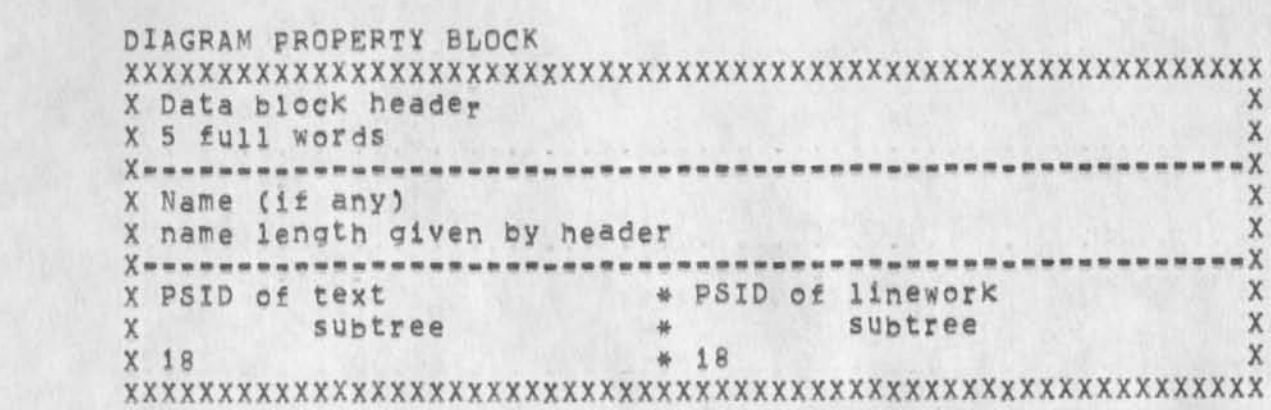
```
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X          *Right name *Left name  *Character*Block *Garb=X
X free     *delimiter  *delimiter  *count    *length*age? X
X 1        * 7         * 7         * 11      * 9    * 1   X
X-----------------------------------------------------------------X
X free * Name length        * PSID pointer to ring element X
X 7    * 11                 * 18   for this statement      X
X-----------------------------------------------------------------X
X Creation time                                                   X
X 36                                                             X
X-----------------------------------------------------------------X
X Property    * Authors initials                                 X
X 15    Type  * 21                                               X
X-----------------------------------------------------------------X
X PSID of inferior tree     * PSDB of the next property          X
X 18                        * 18                                 X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

1d1

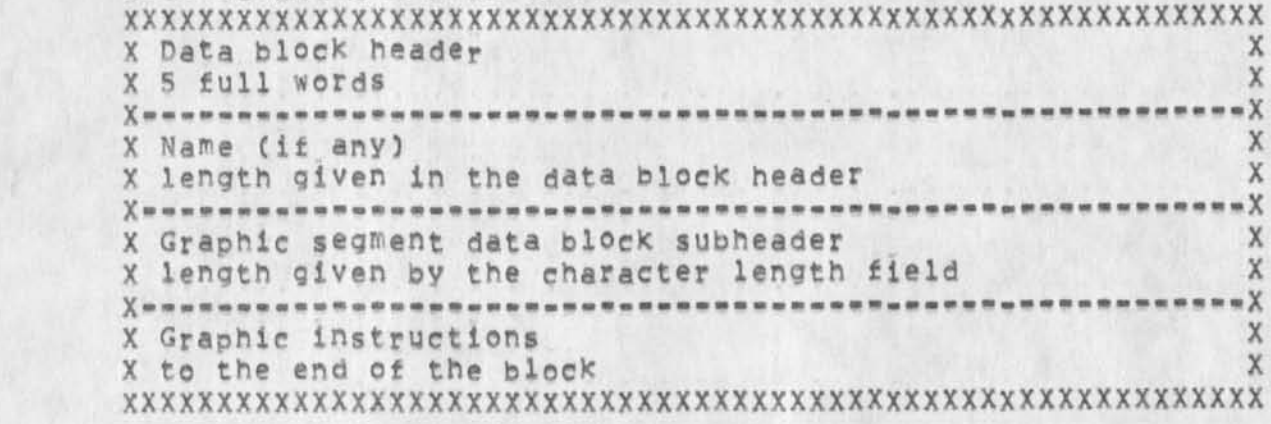
```
(sdbhead) RECORD %sdbhdl is length%                                    1d2
   sgarb[1],    %true if this sdb is garbage%                          1d2a
   slength[9],  %number of words in this sdb%                          1d2b
   schars[11],  %number of characters in this statement%               1d2c
   slnmdl[7],   %left name delimiter for statement%                    1d2d
   srnmdl[7],   %right name delimiter for statement%                   1d2e
   spsid[18],   %psid of the statement for this sdb%                   1d2f
   sname[11],   %position of character after name%                     1d2g
   stime[36],   %date and time when this sdb created%                  1d2h
   sinit[21],   %initials of user who created this sdb%                1d2i
   sptype[15]; %property type of this data block%                      1d2j
      %                                                                1d2j1
      txttyp   = text data block (SDB)                                 1d2j2
      dhdtyp   = diagram header block                                  1d2j3
      segtyp   = segment data block                                    1d2j4
      %                                                                1d2j5
   spsdb[18],   %PSDB of the next property data block 0=tail%         1d2k
   sitpsid[18], %PSID to head of inferior tree if any%                 1d2l
   %sgarb and slength must be in the first word of the header          1d2m
   for newsdb%                                                        1d2n
                                                                      1d2o
PROPERTY BLOCK DEFINITIONS                                             1e

   STATEMENT DATA BLOCK (SDB'S)
   XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
   X Data block header                                                X
   X 5 full words                                                     X
```



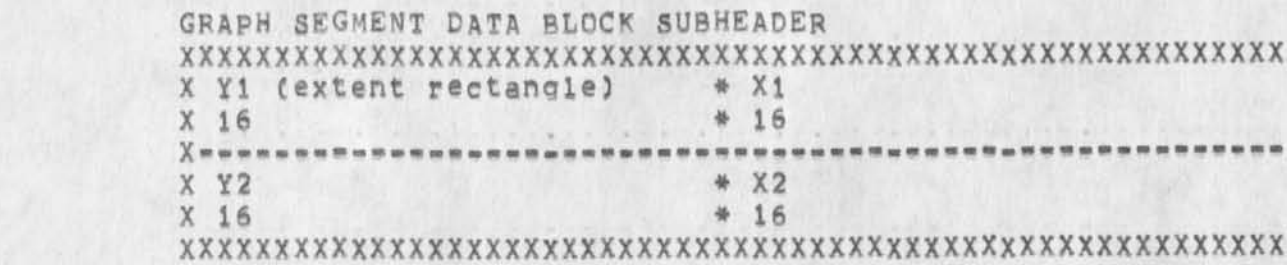
1e1



1e2



1e3



1e3a

GRAPHIC INSTRUCTION FORMATS

1f

```
(gphins) RECORD   %graphic instruction format%                    1f1

   gphops[8],  %instruction opcode (type)%                         1f1a

   gphlgt[8],  %instruction length in words including the
   first%                                                          1f1b

   gphatt[1],  %true if attachable (more prominant for
   pointing)%                                                      1f1c

   gphint[3],  %intensity of painted linework%                     1f1d

   gphvec[3],  %vector type%                                       1f1e

      %                                                            1f1e1

      vcsolid   = solid vector                                     1f1e2

      vcdotted  = dotted vector                                    1f1e3

      vcdashed  = dashed vector                                    1f1e4

      %                                                            1f1e5

   gphnll[8],  %free%                                              1f1f

   gphmor[1];  %true if flags cntinue to the next word%            1f1g

                                                                   1f1h
```

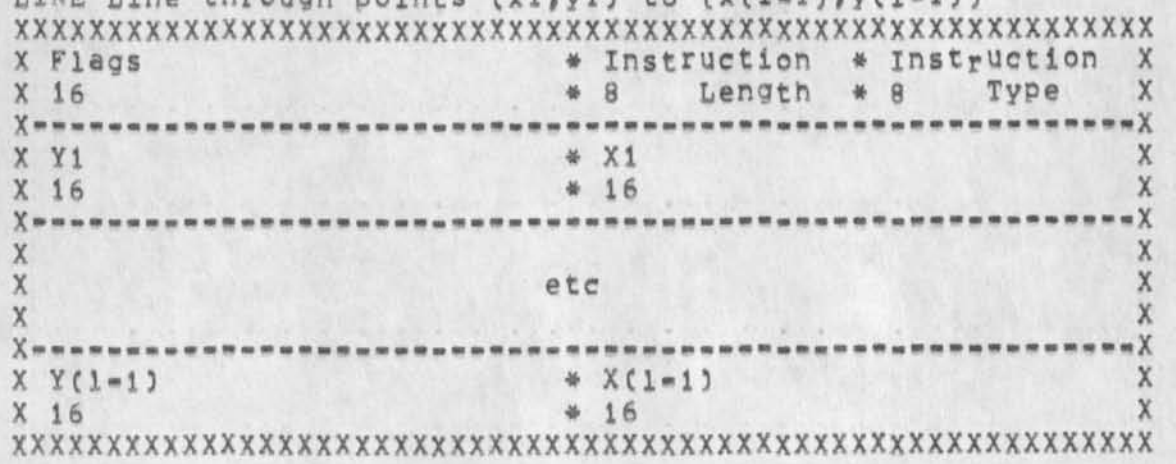
```
FLAG BYTE
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X null     *more*  free                *vector*inten-*attach-X
X          *  ? *                      * type * sity * able? X
X          *    *                      *      *      *       X
X          * 1  *  8                   * 3    * 3    * 1     X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

1f2

```
POINT  Dot at (x1,y1)
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X Flags                      * Instruction  * Instruction  X
X 16                         * 8   Length   * 8    Type    X
X-------------------------------------------------------X
X Y1                         * X1                          X
X 16                         * 16                          X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

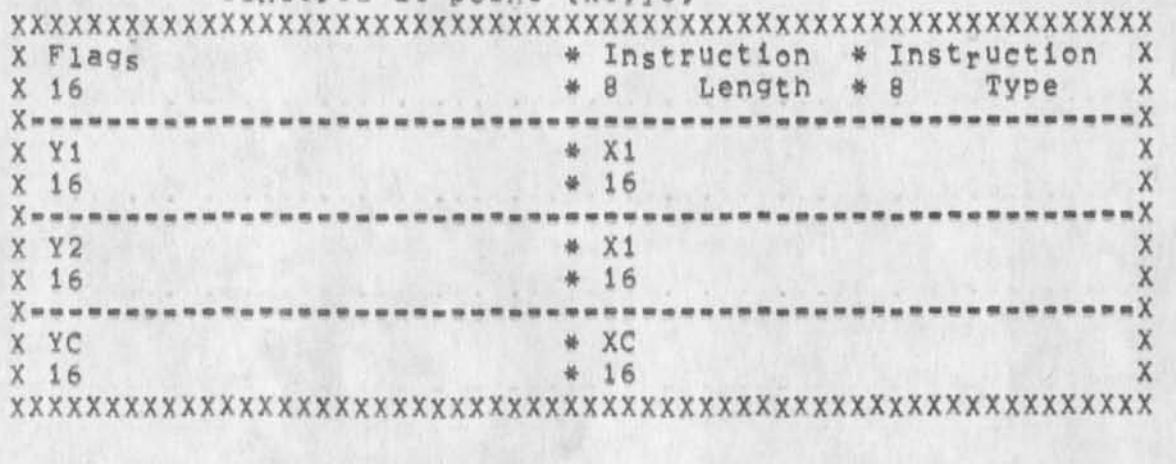
1f3

LINE Line through points (x1,y1) to (x(1-1),y(1-1))



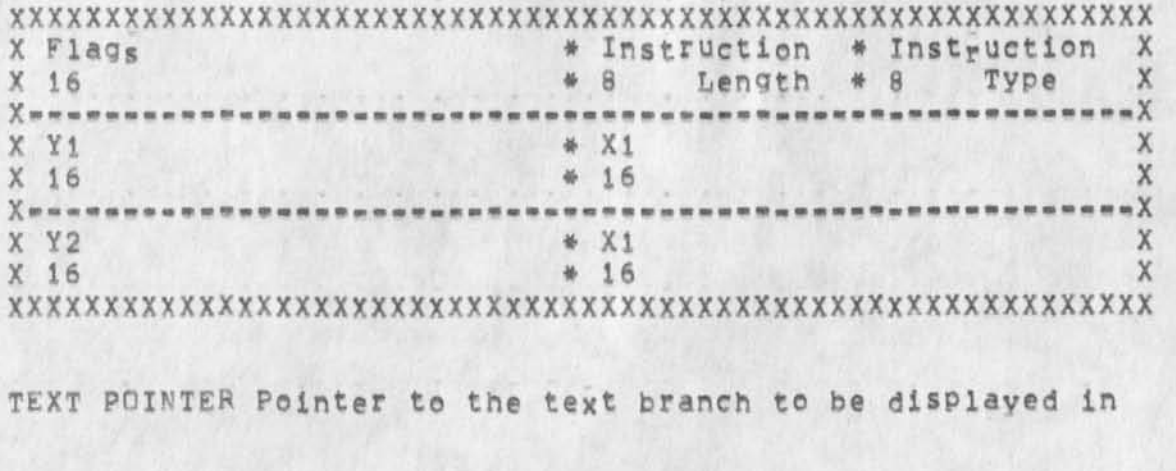
1f4

CIRCLE/ARC Counterclockwise arc (x1,y1) to (x2,y2)
centered at point (xc,yc)



1f5

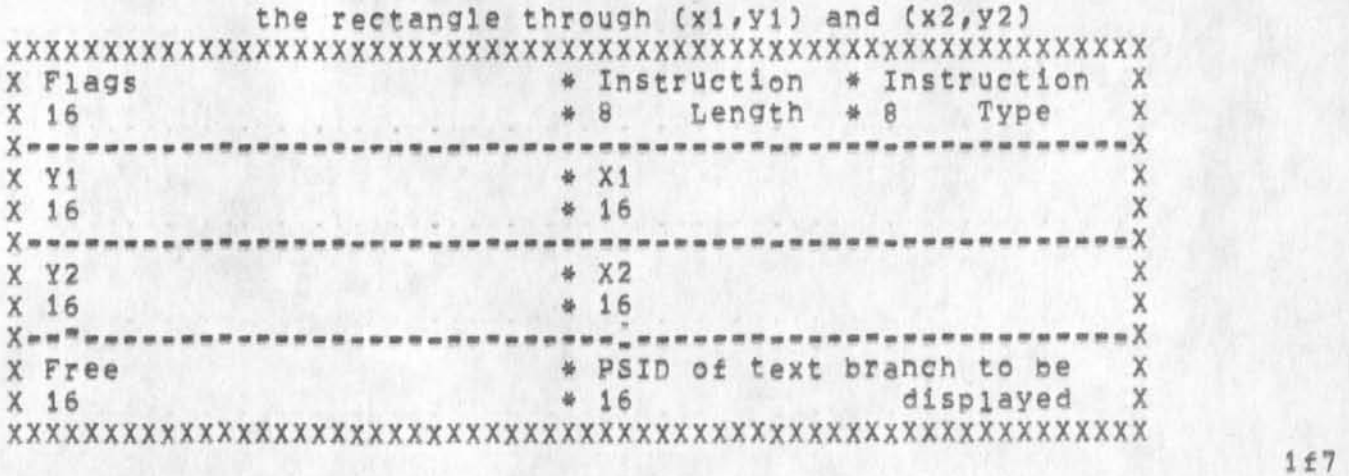
TEXT WINDOW Invisible text boundary defined by
the rectangle through (x1,y1) and (x2,y2)



1f6

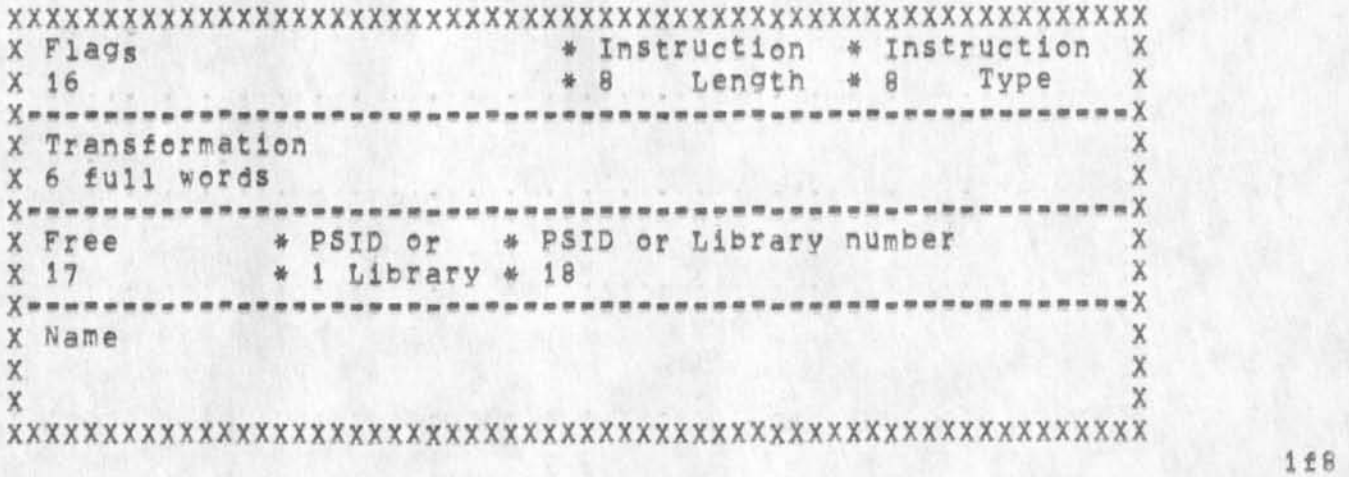
TEXT POINTER Pointer to the text branch to be displayed in

the rectangle through (x1,y1) and (x2,y2)



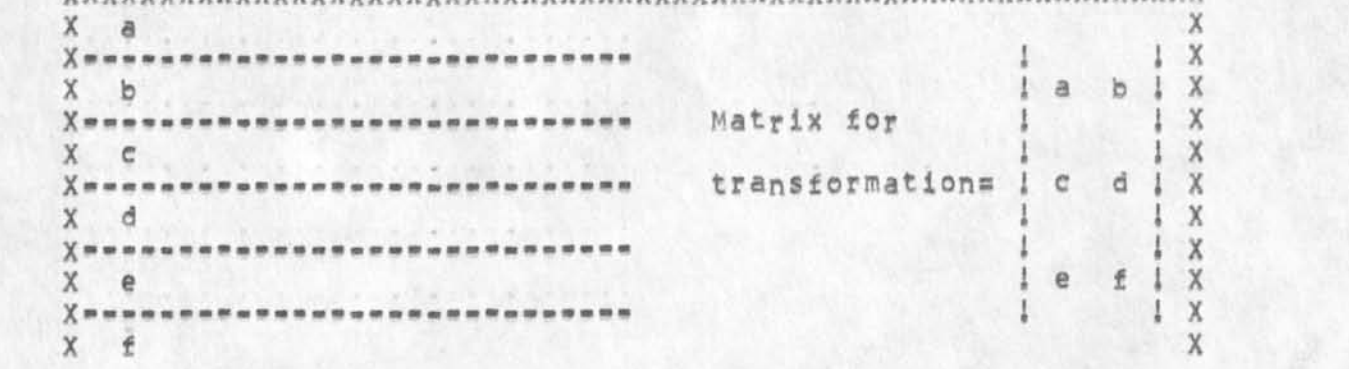
1f7

CALL Invoke an instance of the branch indicated in the PSID or in the numbered template library with the given name, using the transformation



1f8

TRANSFORMATION



XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 1f8a

RLB2 20-JAN-75 14:35 25154

New NLS File Structure

(J25154) 20-JAN-75 14:35;;;; Title: Author(s): Robert Louis Belleville/RLB2; Distribution: /NPG([INFO-ONLY]) ; Sub-Collections: SRI-ARC NPG; Clerk: RLB2; Origin: < BELLEVILLE, NLS-FILE-STRUCTURE.NLS;1, >, 14-JAN-75 15:00 RLB2 ;;;;####;

HGL 20-JAN-75 17:03 25155

Request for References from Jeff Rothenberg at ISI and Reply by HGL

If you have any additions to the list, please lt me know as soon as possible, HGL

HGL 20-JAN-75 17:03 25155

Request for References from Jeff Rothenberg at ISI and Reply by HGL

16-JAN-75 0936-PST ROTHENBERG at USC-ISIB: Need NLS document references !
Distribution: ARC-HELP:, white at arc, watson at arc
Received at: 16-JAN-75 09:36:41 1

We are finally getting out our Research Reports on the IA project spec. This is NOT the new design spec, but the older "SSD's" (system Specification Documents). 1a

I have gotten considerable negative feedback from people up there w.r.t. our lack of references to NLS. And rightly so. When we originally prepared the documents, we were in a hurry to get them out in initial form, and so we included almost no references. 1b

However, now we are sprucing them up a bit for publication, and we would like to include relevent references to your work. 1c

The problem is that it's hard to select the most significant and relevant stuff. 1d

It would help greatly if you could prepare a short list (say five to ten) of what you consider to be the most significant recent documents your group has produced on the subjects of editing and message services. Since any one of us is unlikely to have read all of these, it would also help if you could include a brief description of each document (i.e., topics discussed, conclusions reached, etc.). 1e

We are trying to get these out in the next week or so, so to be sure of getting your "licks" in, please try to get something to us as soon as possible. 1f

Jeff 1g

******** REPLY from HGL, 20 January 1975 2

Jeff --- 3

The following documents were suggested as the most relevant references to articles and reports dealing with the ARC project. You should have copies of many of them already, but if you wish any of them let me know. 4

Harvey 5

General papers widely available: 6

Engelbart, D.C., Watson, R.W., Norton, J.C. "The Augmented

Knowledge Workshop", AFIPS Proceedings, National Computer Conference, Vol. 42, pp. 9-21, June 1973. Contains an outline of te general philosophy of ARC including research goals and strategies as well as historical details. Also has a bibliography of ARC reports as well as influences on our work. 6a

Engelbart, D.C. "Design Considerations for Knowledge Workshop Terminals", AFIPS Proceedings, National Computer Conference, Vol. 42, pp. 221-227, June 1973. Contains a description of the types of terminals and terminal interactions required and available in the ARC environment and the motivations for their development. Contains an extensive annotated bibliography. 6b

Irby, Charles H. "Display Techniques for Interactive Text Manipulation", AFIPS Proceedings, National Computer Conference, Vol. 43, pp. 247-255, May 1974. Discusses the ARC model for two dimensional text tools based on interactive display terminals. The primitives provided by the conceptual display terminal interface to an application program are presented. 6c

Andrews, Donald I. "Line Processor -- A Device for Amplification of Display Terminal Capbilities for Text Manipulation", AFIPS Proceedings, National Computer Conference, Vol. 43, pp. 257-265, May 1974. Describes the Lineprocessor interface created at ARC to permit the use of inexpensive alphanumeric video display terminals with NLS in the model outlined in Irby's paper. 6d

Engelbart, D.C., English, W.K., "A Research Center for Augmenting Human Intellect", AFIPS Proceedings, Fall Joint Computer Conference, Vol. 33, pp. 395-410, May 1974. General presentation of ARC and NLS functions as they existed in 1968. Much remains valid today, though of course our more recent project reports and internal documentation supercede large sections dealing with implementation details. 6e

Project reports available through SRI or NTIS: 7

Our most recent report is currently being prepared. It will have a discussion of several new features of NLS such as the onlin help facility. References to earlier reports may be found in the more recent National Computer Conference papers noted above. 7a

Specialized internal documents available from ARC and listed in the ARC Journal: 8

Multi-host Journal Design 8a

White, James E. Multi-host Journal Design. ARC Journal (23144,) and (23143,). May 1974. General discussion and

virtual machine design of a multi-host extension of ARC's running mail, catalog, and dialog support system, the ARC Journal. 8a1

The present ARC Journal in its developmental stages was discussed in earlier ARC project reports: "Computer-Augmented Management-System Research and Development of Augmentation Facility", April 1970 and "Online Team Environment"< June 1972. 8a2

CML documentation 8b

Dornbush, Charles F. "Updated Command Meta Language Documentation" ARC Journal (20438,) November 1973. Describes the language now used to descibe the syntax and semantics of the user interface to NLS. 8b1

Irby, Charles H. "New CML Features for NSW". ARC Journal (25056,) January 1975. Additions to CML currently being implemented. 8b2

Dornbush, Charles F., Victor, Kenneth E., Irby, Charles H. "A Command Meta Language for NLS" 10 January 1975. ARC Journal (22130,). Also to be published in Proceedings of the First Annual ACM-NBS Workshop on Machine Independent Graphics held in April 1974. This paper discusses the philosophy of a split NLS with CML as the language for specifying the user interface of such a system. 8b3

Tree Meta documentation 8c

Andrews, D.I., Lehtman, H.G., Paxton, W.H. "Tree Meta-- A Metacompiler for the Augmentation Research Center" ARC Journal (14045,) and (14046,) Jamuary 1971. Earlier versions of Tree Meta were described in the ARC 1968 final project report. 8c1

L10 documentation 8d

Paxton, W.H. "L10 -- A Programming Language for the Augmentation Research Center", December 1970, ARC Journal (7052,). This is the most complete version of the L10 documentation. Supplements describe additions to the language since it was written. We are currently implementing an expanded version of L10 which will be used to produce code for either the DEC PDP-10 or PDP-11. It will be used to write execution and back end functions for the NSW version of NLS. 8d1

NLS File System 8e

Lehtman, H.G. "NLS File System Documentation". ARC Journal

(17069,). June 1973. Earlier descriptions of the NLS Random file structure were in the ARC 1970 report (5139,) and in the June 1972 report (13041,). The file system is currently being modified to permit data property lists. This expansion will permit an implementation of graphics as well as other data types. 8e1

Bellville, R.L. "Proposed Revised NLS File Structure". ARC Journal (25154,). January 1975. 8e2

PCP Description 8f

White, James E. "The Procedure Call Protocol -- Version 2". 1 January 1975. Contains several documents describing the virtual interhost and interprocess programming environment provided by PCP and the protocols which implement it. 8f1

Postel, Jonathan B. "National Software Works Protocols -- Version 2". 1 January 1975. Contains specific application packages based in PCP. 8f2

NSW Operating System Interface 8g

Ken Victor is currently working on this. 8g1

BBN-Scholar 8h

Grignetti, Mario C., Gould, Laura C., Bell, Alan, Hausmann, Cathy, Passafiume, Joseph J. "Mixed-Initiative Tutorial System to Aid Users of the On-line System (NLS)" Semiannual Progress Report (Phase I) 15 May 1974. Bolt Beranek and Newman Inc. This report discusses the use of BBN-Scholar to create a tutor for NLS. It would act as a supplement to the existing NLS help facilities. 8h1

HGL 20-JAN-75 17:03 25155

Request for References from Jeff Rothenberg at ISI and Reply by HGL

(J25155) 20-JAN-75 17:03;;;; Title: Author(s): Harvey G. Lehtman/HGL; Distribution: /RWW([INFO-ONLY]) CHI([INFO-ONLY]) DCE([INFO-ONLY]) KEV([INFO-ONLY]) RLB2([INFO-ONLY]) EKM([INFO-ONLY]) DSM([INFO-ONLY]) JEW([INFO-ONLY]) JBP([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: HGL;