Display and Supporting TENEX resources Needed for Development Programmers

1 RESOURCES NEEDED FOR DEVELOPMENT PROGRAMMERS 1

2 Display Workstations 2

2a The ideal programmer-to-display workstation ratio is, of course, 1 to 1. The point at which we begin losing money because of lost time is probably someplace between 1 to 1 and 2 to 1. Workstations are inexpensive compared to programmer-time. 2a

2b It is my guess that 1.5 programmers per display would be tolerable although there will still be times when an indiviual programmer needs to do something on a display and can't and loses time because he uses a typewriter, a teletype type terminal, or files the task away to be reactivated later. 2b

2c This means we need 9 display workstations reserved to the 14 current development programmers. 2c

2d Our present situation is disasterous. Wednesday night Karolyn came in about 8:30 p.m. She found 14 people here and no free displays. She busied herself with other, less essential tasks for 3 hours, gave up and went home shortly before midnight. 2d

2e Today, from about 9:00 a.m. until noon there were 3 displays available to the 14 development programmers. No one in the NLS group, for example, had access to a display and we really needed it. 2e

2f We have 2 new programmers who should have access to displays for learning purposes as well as starting to do their work in the recommended ARC mode. One has had a total of 10 minutes in 5 days and the other not a great deal more. 2f

3 Portion of a TENEX 3

3a This is not nearly as clear as the workstation question because a TENEX doesn't mean much. Therefore, I cite two observed examples, BBNB and ISIC. 3a

3b 40 % of the BBNB TENEX is marginally satisfactory, but not at all good, for 1 NLS display user when the other 60 % is being heavily used which is always the case between 5:00 a.m. and 5:00 p.m. 3b

3c This morning 3 development staff members were sharing our 40 %. Response was so bad that when one of them logged out no one else could log on because ELF timed out before BBNB responded. 3c

3d Experience on the ISIC 512K TENEX with 1 disk gives good to excellent reponse to about 8 users, 4 of whom (on the average) have been NLS display users. 3d

3e However, there are now 4 people who have transferred a few of their files to the ISIC system and we have no more file space available for online files. Please note that there is no NLS, Frontend, L10, CML, etc source code there. 3e

3f It is my (probably overly optimistic) feeling that about 7 % of a 512 K TENEX per programmer display workstation would give reasonably good response. 3f

3g This means that for 9 programmer workstations we need 72 % of a 512 K TENEX with sufficient disk for all our active files. At this point in our development effort (we are maintaini ng 3 completely different versions of NLS for example) we need at least three disks. 3g

3h These resources should support an active, productive development programmer staff of 14. 3h

3i The remaining 28 % of the machine could probably support one display for support steff, printer spooler and a few TI terminals. 3i

EKM 6-JUN-75 18:30 25977

Display and Supporting TENEX resources Needed for Development Programmers

(J25977) 6-JUN-75 18:30;;;; Title: Author(s): Elizabeth K. Michael/EKM; Distribution: /RWW([ACTION]) JBP([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: EKM; Origin: < MICHAEL, JMESS.NLS;2, >, 6-JUN-75 18:27 EKM ;;;;####;

Dispatcher & Encapsulator

1 The Dispatcher 1

1a The main concerns here are the association between the calling user and the directory assigned for his use. The following strategy allows the user to end up in his own login directory. This then allows the regular access controls of the system to be effective. 1a

1b The dispatcher performs the server side of the standard Initial Connection Protocol such that the two resulting connections are openned to a new job (which is a PCP job). 1b

1b1 Listens on the PCP contact socket L 1b1

1b1a L = 25 decimal 1b1a

1b2 Selects a new socket pair (S) from the dispatcher's socket name space (directory relative) 1b2

1b2a In TENEX, selects a new socket pair (S) from a common tool socket space, by means of using directory relative socket names. 1b2a

1b3 Creates a job containing PCP stuff and passes it the host number H, and socket numbers U (remote caller) and S (new local) in the. Creates a new job for each request. 1b3

1b3a In Tenex the arguments are passed in the registers: 1b3a

1b3a1 AC0 = H (8 bit host number) 1b3a1

1b3a2 AC1 = U (Absolute 32 bit receive socket name) 1b3a2

1b3a3 AC2 = S (dir rel 15 bit receive socket name) 1b3a3

1b4 Sends the socket number S to the calling process and closes the connection, then loops back to the begining. 1b4

1b4a The socket sent to the caller is actually S', which is the full 32 bit socket name of the receive socket derived from S, and on TENEX consists of <17 bit directory #><S> 1b4a

1c The TENEX dispatcher can and will see if a system shutdown is pending and imminent. If the shutdown is within some interval T, then the dispatcher will not accept any new ICP requests in order to minimize the possibility of users having their tool yanked out from under them. 1c

1c1 Two approaches are possible. 1) Ignore the request by

sending an immediate CLOSE, or 2) open the send connection and pass some useful status information such as the time We are expected to be back up. (Note that an odd number passed to the caller is a violation of ICP protocol and can be interpreted as a time, or anything else we choose.) Ultimately, we can get as complex as we want to get the proper behavior since selecting the interval T is a problem. There probably exist two types of transactions, short and long. If we select an interval very close to shutdown time, long transaction which don't have a prayer of finishing will be allowed to start. If we make the interval longer, transactions which are short and could possibly finish before shutdown may be rejected and other possible servers may not be available. Generally, I propose that the interval be quite small (maybe 2 minutes), and suggest that ways of alerting the controlling fork created for the new job to the approximate duration of computational service required for this transaction be investigated. 1c1

1d The new job: 1d

1d1 Opens the new 8 bit byte size connections between S and U+3, and between S+1 and U+2. 1d1

1d2 Reads from the newly opened connections the pcp CRTPRO message containing the login and accounting parameters for the calling user 1d2

1d3 Change login identity of this job to the user supplied . 1d3

1d4 Time out and aborts if the login info is not supplied. 1d4

2 The Encapsulator 2

2a The focus here was on the Network Virtual Termial Package (NVTP) and the communication between the Front End (FE) and the Tool. Here a major change in strategy was decided on. 2a

2b Scenario for tool start up: 2b

2b1 The User tells the FE he wants to run the tool. 2b1

2b2 The FE tells the WM the user wants to run the tool. 2b2

2b3 The WM creates a PCP "old tool encapsulator" process at the tool bearing host; this process is passed as startup info the name of the "old tool" subsystem to be run. 2b3

2b3a 1) The startup info (old tool file name) is effectively passed to the NVT package before it is even opened. This

seems a bit funny when it is viewed as more than a special case. 2) In order to get the access control to the "old tool" file right, we must ensure that the job changes to the correct identity given by name, pswrd, acct parms, before the startup info is allowed to be processed. 2b3a

2b4 The WM supplies the login parameters to the newly created tool process. The process initialization code is entered and passed the startup info. 2b4

2b5 The WM introduces the FE and the tool proceess 2b5

2b6 The WM opens he NSW Tool Package and calls he BGNNSW procedure in the tool process. 2b6

2b7 The WM returns to the FE the process handle for the tool process and the grammer for the tool. 2b7

2b8 The FE interpreting the grammer calls the tool process to open the NVT package. 2b8

2b9 The FE locally sets up a user telnet process listening on two sockets (UT & UT+1) . 2b9

2b10 The FE calls on the tool process NVT package SETUPNC procedure passing the argument UT. 2b10

2b10a SETUPNC (UT) 2b10a

2b11 The NVTP initates the tool subsystem as a fork and establishes the connection to the FE's user telnet. The TBH end of these connections feed a NVT (or server telnet) that acts as the primary I/O for the subsystem. The NVTP returns as a note to the FE the local socket numbers used in establishing the connection ST and ST+1. 2b11

2b11a NOTE (ST) 2b11a

2b11a1 Both UT and ST are full 32 bit receive socket names. 2b11a1

2b12 The FE verifies that the telnet connections now established to its user telnet process are in fact from the tool subsystem by checking the ST socket number returned by the tool process against the actual connections. 2b12

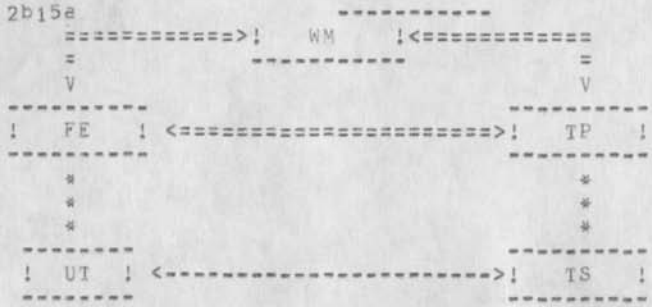
2b13 The FE (as directed by the tool grammer) takes input from the users terminal and hands it to its local user telnet for transmission to the tool subsystem. Data arriving from the tool

subsystem at the user telnet in the FE is delivered to the users terminal using the routines of the FE. 2b13

2b14 The SETUPNC call is left unsatisfied, and therefore allows the NVTP to use help returns to notify the calling process (the FE) of any unusual events (eg subsystem halts). The calling process (the FE) can freeze the NVTP and the tool subsystem by an INTPRO call or abort the use of the tool subsystem by an ABORTPRO call. ABORTPRO will result in closing the NVT. A subsequent SETUPNC will cause the "old tool" to be reinitialized. 2b14

2b15 The resulting configuration has PCP communication paths between the FE and the WM, between the FE and the Tool process, between the WM and the Tool process, and has the telnet path between the tool subsystem and the FE's user telnet. 2b15

2b15a



2b15a

2b15a1 where: 2b15a1

2b15a1a === indicates a PCP connection 2b15a1a

2b15a1b --- indicates a telnet connection 2b15a1b

2b15a1c *** indicates a control path 2b15a1c

2b15a1d WM is the Works Manager 2b15a1d

2b15a1e FE is the Front End 2b15a1e

2b15a1f TP is the Tool Process 2b15a1f

2b15a1g TS is the Tool Subsystem 2b15a1g

2b15a1h UT is a User Telnet 2b15a1h

2c The NVTP also acts as a file reference trapper. 2c

Dispatcher & Encapsulator

(J25978) 6-JUN-75 18:59;;;; Title: Author(s): Jonathan B.
Postel/JBP; Distribution: /JBP([INFO-ONLY]) ; Sub-Collections:
SRI-ARC; Clerk: JBP; Origin: < POSTEL,
DISPATCHER-ENCAPSULATOR.NLS;2, >, 6-JUN-75 18:57 JBP ;;;;####;

a little ditty

1 a message to the wise: practise only signed malachi constant 1

a little ditty

(J25979) 6-JUN-75 19:40;;;; Title: Author(s): Jan A. Cornish/JAC3;
Distribution: /POOH([ACTION]) SGR([INFO-ONLY]) ;
Sub-Collections: SRI-ARC; Clerk: JAC3;

JCN 26-AUG-75 23:04 25980

SRI Proposal No. ISU 74-258 ADDENDUM

This letter proposal for an open ended buy was sent in August 1975 to RADC. Enclosure (journalized separately) listed latest price quotes of Display workstation components (including graphics).

SRI Proposal No. ISU 74-258 ADDENDUM

NLS WORKSHOP EQUIPMENT SUPPORT FOR RADC

Duane Stone
Rome Air Development Center
Griffiss Air Force Base
Rome, New York 13441

Dear Mr. Stone:

With reference to paragraph 4.2 of the statement of work for SRI Proposal ISU 74-258, the enclosed sheet provides the estimated costs of equipment.

Pursuant to the provisions of ASPR 16-206.2, the attached is a cost estimate in lieu of the DD Form 633-4.

The estimated time required before equipment can be provided is 90 days from receipt of authorization.

Since we do not know the precise quantities that the Government will order, we assume that fixed fee will be applied to each "buy" at the rate negotiated in the basic contract.

The prices quoted in the attached sheet are subject to change if suppliers of equipment change their price.

This proposal will remain in effect until 1 October 1975. If consideration of the proposal requires a longer period, the Institute will be glad to consider a request for an extension of time.

Very truly yours,

James C. Norton
Assistant Director

Enclosures

Approved:

Douglas C. Engelbart, Director
Augmentation Research Center

Bart Cox, Executive Director
Information Systems Divison

SRI Proposal No. ISU 74-258 ADDENDUM

(J25980) 26-AUG-75 23:04;;;; Title: Author(s): James C. Norton/JCN;
Distribution: /DCE([INFO-ONLY]) RWW([INFO-ONLY]) JCN([
INFO-ONLY]) RLL([INFO-ONLY]) RA3Y([INFO-ONLY]) BJP([
INFO-ONLY]) ; Sub-Collections: NIC; Clerk: RLL; Origin: <
ARC-LOG, LETTER.NLS;6, >, 25-AUG-75 16:16 RLL ;;;; ####;

25980 Distribution
Douglas C. Engelbart, Richard W. Watson, James C. Norton, Robert N. Lieberman, Raymond R. Panko, Buddie J. Pine,

petty privacy

1 Why am i (superficially) denied access to 32649. 1

petty privacy

(J25981) 7-JUN-75 00:03;;;; Title: Author(s): Jonathan B.
Postel/JBP; Distribution: /JCN([ACTION]) SRI-ARC([INFO-ONLY]) ;
Sub-Collections: SRI-ARC; Clerk: JBP;

RLL 9-JUN-75 00:34 25982

SUG: Indicating a file is being modified

1 It is just a smalll point, but it would be nice to know if the file one loads is currently being modified (by oneself, of course; otherwise your are informed.). This coull be done by addeing sqquare brackets (a la, show directory command) about the link when placed in the TTY window (or just printed for the TNLS folks) as is the present case. True a show file status command will show it also but... small things are neat. My only objection to square bravvkets being the only indication is that is is obscure. any other sugs are welcomed. opposing views tooo. 1

SUG: Indicating a file is being modified

(J25982) 9-JUN-75 00:34;;;; Title: Author(s): Robert N. Lieberman/RLL; Distribution: /FEED([ACTION]) JCN([INFO-ONLY]) JHB([INFO-ONLY]) KIRK([INFO-ONLY]) SGR([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: RLL;

1 25982 Distribution
1a Special Jhb Feedback, James C. Norton, James H. Bair, Kirk E. Kelley, Susan Gail Roetter,

Status of NSW Frontend tasks as of 9-June-75

1 Frontend status as of 9-Jun-75: 1

1a Introduction: 1a

1a1 The following is a status report of NSW Frontend activities, including the CLI, L1011 compiler and runtime, PDP-11 status, and debugging facilities. 1a1

1b CLI status as of 9-Jun-75: 1b

1b1 Currently implemented and working (in CML compiler and CLI runtime): 1b1

1b1a Command word recognition (four flavors ala NLS-8) 1b1a

1b1b Noise words, SHOW, IF, assignment, CONFIRM, ANSWER, OPTION, use of [], CLEAR, use of PARSE FUNCTIONS, execution of rules all work properly. 1b1b

1b1c selection functions (ability to declare them in CML and to collect selections from users at typewriter terminals (fullduplex). 1b1c

1b1d The "?" (show me my current alternatives) feature seems to work properly. 1b1d

1b1e PCP calls are 1b1e

1b1e1 a) simulated with typed out report of the attempted call, 1b1e1

1b1e2 b) simulated via a shared page with a subfork (now being used by WM and NLS group), and 1b1e2

1b1e3 c) performed using actual PCP interface [coded and assumed correct (until I hear otherwise from JEW) for signin, ready-processor, create/delete process, open/close package, call external procedure, and accept external call on local procedure]. 1b1e3

1b1f Ability to declare PCP processes, packages, and procedures in CML. 1b1f

1b1g Builtin CML variables, rules, and functions to support LOGIN, LOGOUT, MOVELOG, RUNTOOL, and ENDTOOL are all implemented and functional. 1b1g

1b1h All of the currently specified WM command language now

parses properly and makes correct PCP calls (as far as I can tell). 1b1h

1b1i All (?) NLS commands are now parsed correctly and make the correct PCP calls. 1b1i

1b1j Handling multiple results from PCP calls is now supported. 1b1j

1b1k pCp to CML to pCp data type converters are now done. 1b1k

1b2 In progress: 1b2

1b2a PCP-temporary-return rules and associated builtin variables. 1b2a

1b2b Support of halfduplex and line-at-a-time terminals. 1b2b

1b2c show syntax of commands. 1b2c

1b2c1 I am debugging the ^S feature of the CLI. I have debugged the HELP feature to the extent of collecting for the semantic help process the syntax of the command as so far specified and the execution of a rule whereby the semantic help process interacts with the user. I have not added code to effect an actual connection to a sematic help process. In addition, a declaration facility in CML to allow the command language designer some control over the operation of ^S is only partially implemented. 1b2c1

1b2d Command backup (backing up the parse). This is working pretty well now. 1b2d

1b3 Yet to be done: 1b3

1b3a Out of line PCP calls and WAIT (this can be deferred for some time). 1b3a

1b3b Perform, Loop, and Exit loop have not yet been implemented. None are difficult. 1b3b

1b3c List-type CML variables. These are quite simple and will be implemented soon. 1b3c

1b3c1 Included here will be the ability to reference elements of the list. 1b3c1

1b3d File name collector. 1b3d

Status of NSW Frontend tasks as of 9-June-75

1b3d1 Agreement has been reached on the form of filenames, although, no mention was made in Bob Millstein's recent memo on this subject of the optional enclosing <> or the optional infile address. In any event, the grammars now in use allow free text for filenames. I have yet to write the real filename collector. 1b3d1

1b3e Change how builtin CML variables, rules, and functions are handled to simplify loading grammars dynamically. Currently they are link-loaded together. We could link-load whenever we load a grammar, But I am trying for a better approach. 1b3e

1b3f CML grammars for the PDP-11. This will probably be done initially by making a version of the CML compiler that produces PDP-11 format relocatable binary files. 1b3f

1b3g CML compacter. I have written but not debugged a CML grammar compacter. It requires variable length CML instructions which hairs up the CLI but makes the grammars about 50% smaller. This could also be used to produce compact grammars for both the PDP-10 and PDP-11. 1b3g

1b3h The INPUT FROM/OUTPUT TO facility for "typescript" and "runfil" have not been implemented. 1b3h

1b3i The declaration of a TERMINAL CLASS function to be called in a tool whenever the user changes his terminal class (because of shared displays or the user simulating a typewriter from a display) has not been implemented. 1b3i

1b3j Only one of the display oriented pointing collectors has been written (this was needed as a test case). The others will be put off until display support is needed. 1b3j

1b3k Command feedback for displays has not been implemented. 1b3k

1b3l Although the CLI uses a user-profile currently, it is not able to dynamically load one for the user. This should be very simple to do when necessary. 1b3l

1c L1011 compiler and runtime: 1c

1c1 Don Andrews and Joe Ehardt are actively testing the compiler/runtime on our development PDP-11. Much of the support routines for the CLI are now functional. We may even be able to show you an undebugged CLI running stand-alone (single user) on the PDP-11 before the week is out. 1c1

Status of NSW Frontend tasks as of 9-June-75

1d PDP-11 status: 1d

1d1 Joe Ehardt has written a ROM bootstrap loader that allows us to load our PDP-11's thru the net in a very reliable fashion. Don Andrews wrote and Joe debugged a stand-alone debugger for our development machine that has greatly facilitated our debugging of the L1011 code and runtime. 1d1

1d2 I beleive we are still in need of a DH-11 device driver, an IMP 11-A driver, and a functional VM ELF (this is almost functional as a terminal support system for our operational PDP-11). For our initial system, we are not relying on ADR to provide terminal handler code, although we expect this will be used in later releases. 1d2

1e NSW DPS debugging: 1e

1e1 Ken Victor has been actively designing and building a debugging environment for NSW DPS processes. He has provided us with some debugging utilities that make use of the basic mechanisms he has designed into the NSW debugger and should help us debug multi-fork configurations. Ken has worked closely with JEW in his design so as to be compatible with the DPS environment. 1e1

Status of NSW Frontend tasks as of 9-June-75

(J25983) 9-JUN-75 02:58;;;; Title: Author(s): Charles H. JFM
;Irby/CHI; Distribution: /SRI-ARC([INFO-ONLY]) WEC([INFO-ONLY])
LAC([INFO-ONLY]) KS([INFO-ONLY]) ; Sub-Collections: SRI-ARC;
Clerk: CHI; Origin: < IRBY, FE-STATUS.NLS;1, >, 9-JUN-75 02:57
CHI ;;;;####;

x110 debugging

1 this document attempts to describe how to use some of the debugger back end routines from ddt to assist in debugging x110 programs. 1

2 the basic approach consists of editting some files (for address space configuration constarints), compiling some files, loading these files with the files you wish to debug, using tenex ddt to set breakpoints, examine/modify memory, etc., calling procedures that i have provided to display stack frames, records, catchframes, etc. 2

3 detatiled instructions: 3

3a 1) edit the file [bbnb]<victor>symbol.nls as follows: 3a

3a1 the two constants: frstpage & lastpage define the inclusive bounds of pages in the address space to be used as window pages for examining a fork. set these up to point to an unused area in your address space; the larger this area the better; 3a1

3a2 the nsw debugger keeps a copy of the symbol table for the fork it is debugging in its own address space. the size of this area is defined by the constant symzarea. in the special case where you are debugging the same address space as the one in which the debugger lives, this constant can get set to some small token amount to conserve space in your adr space, since the debugger does not in this special case get a duplicate copy of the symbol table. 3a2

3a3 (all these constants are statement names so it should be easy to find them) 3a3

3b 2) compile the following files using x110 to whatever rel files you like: 3b

3b1 [bbnb]<victor>symbol.nls % as editted above % 3b1

3b2 [bbnb]<victor>110ddt.nls 3b2

3b3 [bbnb]<victor>debug.nls 3b3

3c 3) load the above rel files with your rel files 3c

3d 4) this step is optional but recommended for your own convience: 3d

3d1 debugger functions are invoked by the execution of the followings instruction in ddt: 3d1

3d1a pushj s,func 3d1a

3d2 it is impossible in 110 to define a symbol with a 36bit value such that the righthalf is a relocatable adr, therefore i recommend that in your runfil for loading that after the load is done, you go into ddt and perform the following steps : 3d2

3d2a define the symbol st to have the value pushj s,stop (this is the procedure to show the top stack frame) by typing the following to ddt: 3d2a

3d2a1 pushj s,stop<st: 3d2a1

3d2b define the symbol sc to have the value pushj s,scur (this is the procedure to show the current stack frame) by typing the following to ddt: 3d2b

3d2b1 pushj s,scur<sc: 3d2b1

3d2c make the following symbol definitions: 3d2c

3d2c1 pushj s,sback<sb: % show preceeding stack frame 3d2c1

3d2c2 pushj s,snext<sn: % show next stack frame 3d2c2

3d2c3 pushj s,sown<so: % show stack frame of coroutine owner 3d2c3

3d2c4 pushj s,sfra<sf: % show stack frame for mark in global frame 3d2c4

3d2c5 pushj s,srec<sr: % show record (described below) 3d2c5

3e 5) using the debugger 3e

3e1 the procedures in the debugger all assume that a valid 110 environment exists at the time they are called, therfore it is your responsibility to set up this environment before calling any of the debugger procedures. you may then set tenex ddt breakpoints as you wish and cAll thiese procedures while at the breakpoint by typing the following (for example): 3e1

3e1a stx if you did step 4 above or pushj s,stopx 3e1a

3e2 after hitting a breakpoint if you wish to examine the stack you must call the procedure stop before calling the procedures snext, sback, sown, or scur 3e2

3e3 to show a record, place the address of the instance of the record you wish to see in the global cell cradr and the name of

the record in the 110 string crname, and then call the procedure srec 3e3

3f 6) debugger output 3f

3f1 all output is in octal (will be user settable in the nsw debugger) 3f1

3f2 coroutine names in show frames may not be right (will be when a newer version of the compiler is brought up) but addresses will be right 3f2

3f3 the number of declared formals and number of locals will always be zero, but the number of passed formals to a procedure will be right 3f3

3f4 in displaying a record the field value will always be displayed in octal, and if there is a symbol in the symbol table with the exact value of the field value it will also be displayed symbollically. 3f4

3f5 in displaying a record the size of each field is shown in (octal) bits 3f5

3g 7) where to set breakpoints 3g

3g1 for best results set breakpoints at the following places: 3g1

3g1a procedure-name + 1 3g1a

3g1b coroutine-name + 3 3g1b

3g1c after a pcall after the store of the calling frame port id (this is usually a movem 8,-1(M) inst after a jsp a4,pcall inst) 3g1c

4 i believe that the debugger does not clobber any records and that it works, but please understand that it is still under development. please advise me of any problems you run into 4

5 my current plans call for me to next implement a procedure to display the catchframes for the current stack frame, and then perhaps procedures for displaying of formals. after that i intend to work on a higher level in the debugger, but am open for suggestion if you would like other primitives (e.g. show string) that would assist in your current debugging 5

x110 debugging

(J25984) 9-JUN-75 20:46;;;; Title: Author(s): Kenneth E. (Ken) Victor/KEV; Distribution: /NPG([INFO-ONLY]) ; Sub-Collections: SRI-ARC NPG; Clerk: KEV; Origin: < VICTOR, DOC-DEBUGGER.NLS;1, >, 9-JUN-75 17:37 KEV ;;;;####;

1 25984 Distribution
la Larry L. Garlick, Robert Louis Belleville, Elizabeth J. Feinler, Joseph L. Ehardt, Jonathan B. Postel, Kirk E. Kelley, Karolyn J. Martin, David S. Maynard, Kenneth E. (Ken) Victor, James E. (Jim) White, Elizabeth K. Michael, Don I. Andrews, J. D. Hopper, Charles H. JFM ;Irby, Harvey G. Lentman,

letter to Dan Garvin of the city of Tracy, Calif.

This might be a good start for a handout on our capabilities.

letter to Dan Garvin of the city of Tracy, Calif.

1

Dan Garvin
Director
Community Development Department
City of Tracy
P.O. Box 1029
Tracy, California 95376 1

2 Dear Mr. Garvin, 2

3 At the request of Dr. Engelbart I am responding to your letter of 27 May 1975 in which you inquired about the present status of the Augmentation Research Center (ARC) developments. 3

4 For nearly 13 years our center has been developing an augmented environment in which managers, researchers, programmers, and clerical personnel perform their daily tasks utilizing advanced tools, techniques, and skills. Because this "dream" is so vast and will have such an impact on people and organizations, we have established certain pragmatic strategies for our center. 4

5 First, we have limited our direct developments to the very basic or core activities of knowledge workers (our term for people who work with information). 5

5a These are the reading, writing, and communicating of information. A basic application of our developments is the augmentation of "dialogues" among planners, researchers, etc. of which you spoke in your letter. 5a

6 Second, the tools and techniques being developed can only be successfully transferred to the ultimate users by what we call the participatory evolutionary approach. 6

6a Simply, this means that "real" users (other than computer researchers) must participate in the steady advancement of the augmented environment. 6a

7 In direct response to your question the following integrated capabilities are NOW available and, indeed, are being used by several hundred people in 12 organizations. 7

7a 1. Computer capture of text from direct typist input, typist to cassettes, magnetic tapes, and computer communications networks (e.g. ARPANET) which include computer to computer transfer of data. 7a

letter to Dan Garvin of the city of Tracy, Calif.

7b 2. Text manipulation and editing with a very sophisticated, two dimensional computer based system. 7b

7c 3. Hardcopy output with extensive formatting controls (e.g., pagination, margins, typefonts). 7c

7c1 This includes output to a COM device (Computer Output to Microfilm) which, in turn, can submit camera ready copies for commercial printing. A wide variety of character sizes and styles can be specified. [Two of the papers enclosed, <1> and <2>, were produced via this COM method; the third paper <3> was printed by a computer line printer.] 7c1

7d 4. Reading and searching of text with a variety of view specifications. 7d

7d1 This enables the user to peruse text in a more effective manner and locate particular passages with the aid of the computer. 7d1

7e 5. Structuring computer documents in an hierarchical manner. 7e

7e1 This is basic to the way one reads using our system, allows better organization of ones thoughts, and facilitates retrieval of information. 7e1

7f 6. Textual communication. 7f

7f1 There is a facility to send mail to individuals or groups. Any mail sent using this subsystem receives a unique accession number, automatic delivery to specified individuals or groups, and permanent storage of the mail in what we call the Journal. The Journal represents the total collection of short messages, letters, documents, reports, etc. that have been submitted by any user of the system. 7f1

7f2 In effect, the Journal becomes a permanent repository of all dialogue among users of the system. [Privacy considerations are available to restrict reading and cataloguing of items in the Journal. However, the general openness of the Journal has provided a rich source of historical information.] Communication of mail items to anyone known to the system is possible, even if the recipient is "located" on another computer across the country. 7f2

7g 7. Other facilities include a computer based calculator, computer programming support subsystem, user customization subsystem [to modify the system for each individual], and various special user programs. 7g

letter to Dan Garvin of the city of Tracy, Calif.

8 As I mentioned above, our strategy is to include "real" workers in a growing community of system users. Thus, we have implemented a "Utility" service for interested subscribers. Our clients use the service in their daily work. Having provided over 17 months of operationally stable and reliable service to many clients, we feel confident that this experiment in transferring advance technology to managers, scientists, etc., will evolve into the augmented environment in our "dream". 8

9 I have enclosed a few papers that give some additional background. If we can be of any further assistance, please contact us. If additional interest is generated, a demonstration and further conversations can easily be arranged. You are certainly welcome to visit us at your convenience. 9

10 Sincerely yours, 10

Robert N. Lieberman

11 Enclosures: 11

11a <1> 11a
11a1 "Coordinated Information Services for a Discipline- or Mission-Oriented Community," Douglas Engelbart, 12-DEC-72, (mjournal,12445,) 11a1
11b <2> 11b
11b1 "The Augmented Knowledge Workshop," Douglas C. Engelbart, Richard W. Watson, and James C. Norton, 1-MAR-73, (ijournal,14724,) 11b1
11c <3> DRAFT 11c
11c1 "The SRI-ARC Workshop Utility Service: What and Why," James Norton, 1-OCT-74, (jjournal,24031,) 11c1

letter to Dan Garvin of the city of Tracy, Calif.

(J25988) 13-JUN-75 15:42;;;; Title: Author(s): Robert N. Lieberman/RLL; Distribution: /DCE([INFO-ONLY]) ARC-LOG([INFO-ONLY]) JCN([INFO-ONLY]) ; Sub-Collections: SRI-ARC ARC-LOG; Clerk: RLL; Origin: < LIEBERMAN, GARVIN.NLS;11, >, 13-JUN-75 15:11 RLL ;;;; ####;

JDH 10-JUN-75 20:48 25989

Sendmail Distribute Failure for Recent Items

1 The "Distribute" command for a new item (within a day of system processing) often fails due to the catalog file's not yet having been updated (so the item still resides in its partial copy). 1

2 This file is large so updating it is expensive and a bit dangerous. It usually happens twice a day (around 11:30 AM and 5:30 PM our time) though it may be as long as a day or two during these first few weeks of running 1.33 TENEX. 2

3 When the catalog search fails, the system doesn't have its standard path to the item so the command cannot be carried out. 3

JDH 10-JUN-75 20:48 25989

Sendmail Distribute Failure for Recent Items

(J25989) 10-JUN-75 20:48;;;; Title: Author(s): J. D. Hopper/JDH;
Distribution: /EJK([ACTION]) FEED([INFO-ONLY]) ;
Sub-Collections: SRI-ARC; Clerk: JDH;

1 25989 Distribution
1a Edmund J. Kennedy, Special Jhb Feedback,

Rejournalized for the purpose of entering it in the DIRT subcollection.

1 Dirk -- 1

2 The few paragraphs I promised you a long time ago on Projects and Nodes are now in an NLS file for your perusal: < SATTLEY, PNSTUFF.NLS, >. It was an interesting learning exercise to transform it from a Teletypewritten sequential file to an NLS file in upper and lower case; I suppose it would have served your purposes better if I'd sent you the sequential file! Anyhow, it's an extract from a very early working document here, and I've added nothing to modernize it; I believe that everything it says is still valid. 2

3 Is there anything I can look at for you in the WM Help documentation? If you need short paragraphs on specific topics, I can probably help at that. (Meaning to imply that if you asked me to prepare a whole document, it would take forever.) 3

4 I've been reading with pleasure the various sample sessions and introductions that have come through the DIRT distribution. I'm especially pleased with POOH's Calculator Introduction -- perhaps because I found it impossible to figure out how the Calculator Subsystem worked from the documentation I have, even including the present NLS Help file; I don't believe it says anywhere in the present Help file that a Number can be given by naming an accumulator which contains it, nor how the CALC file works. 4

5 While we're at it, I have two small criticisms: 5

5a In Editing Sample Session I (25863,), "alleged" is misspelled as "alledged" (but then it was in the Primer, too). 5a

5b In Editing Sample Session II, won't the copy Text command, at (25973, 2I1), pick up the '. as the first character of the text, before the two blanks, and thus produce ".." in Statement 6? 5b

6 As I presume you're aware, the present working file for WM commands is (nsw-sources, wm-cmi,). I have next to put into it the Help return rules -- which won't affect your command descriptions much -- and two new commands, SCOPE and DISPLAY; SCOPE is for changing one of a user's scopes, and DISPLAY is an analogue of Tenex DIR, for listing the names of the files accessible under some criterion. They should be along shortly. 6

7 -- Kirk. 7

(J25990) 11-JUN-75 17:05;;;; Title: Author(s): Kirk Sattley/KS;
Distribution: /DMB([ACTION] dirt notebok please) DIRT([INFO-ONLY]
) ; Sub-Collections: NIC DIRT; Clerk: DVN;

1 25990 Distribution
1a Delorse M. Brooks, Jonathan B. Postel, Priscilla A. Wold, Rita Hysmith, Pamela K. Allen, Delorse M. Brooks, Elizabeth F. Finney, Beverly Boli, Lawrence A. Crain, Kirk Sattley, Susan Gail Roetter, Robert N. Lieberman, Ann Weinberg, Kenneth E. (Ken) Victor, Douglas C. Engelbart, James H. Bair, Elizabeth K. Michael, Richard W. Watson, Elizabeth J. Feinler, Harvey G. Lehtman, Kirk E. Kelley, Laura E. Gould, Jeanne M. Beck, Dirk H. Van Nouhuys, James C. Norton,

DVN 11-JUN-75 18:43 25991

Cooperation on Works Manager Documentation

1 Kirk,

2 I have taken the liberty of rejournalizing your item (25986,) to add it to the DIRT subcollection.

3 I looked at pNSTUFF and coppied it to the place where the works manager help draft will live, (bbnb,help,worksmanager,). It will be helpful (no pun intended).

4 I hope very much you will soon be able to help me with the worksmanager documentation. The draft I worte a month or so ago in long hand has still not been typed in completely . It was promissed again yesterday. That will teach me not to work offline. The moment I have seen it and edited, it I will pass it to you and Charles for comment.

5 Regards,

6 Dirk

DVN 11-JUN-75 18:43 25991

Cooperation on Works Manager Documentation

(J25991) 11-JUN-75 18:43;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /KS([ACTION]) DMB([ACTION] dirt notebook please) DIRT([INFO-ONLY]) ; Sub-Collections: SRI-ARC DIRT; Clerk: DVN;

1 25991 Distribution
la Kirk Sattley, Delorse M. Brooks, Jonathan B. Postel, Priscilla A. Wold, Rita Hysmith, Pamela K. Allen, Delorse M. Brooks, Elizabeth F. Finney, Beverly Boli, Lawrence A. Crain, Kirk Sattley, Susan Gail Roetter, Robert N. Lieberman, Ann Weinberg, Kenneth E. (Ken) Victor, Douglas C. Engelbart, James H. Bair, Elizabeth K. Michael, Richard W. Watson, Elizabeth J. Feinler, Harvey G. Lehtman, Kirk E. Kelley, Laura E. Gould, Jeanne M. Beck, Dirk H. Van Nouhuys, James C. Norton,

DVN 11-JUN-75 18:56 25992

My Time And Place

1 There have been various changes and ambiguities in the plan for me to devote time to the Documentation Productuin, Planning , and Control Community and I need to plan vacation time so I thought I would double check that we are all expecting the same thing. I imagine that on July 1 the ammount of time I devote to ARC Development will fall to 25% and the 75% will got to the Community. ARC Development is expecting the 25% to be available through the nine-month extension of the NSW contract, that is till April. 1

2 These things being true, does anyone see a particular problem in my taking a week of vacation from July 7-14 and maybe the following week? 2

3 Similarly I know of no concrete planning about where I will sit and get computer and clerical support. For the moment I assume I am keeping my same office, keeping my same system accounts, and split clerical support according to the subject as I have been doing. We may want to change some or all these things in the future. 3

DVN 11-JUN-75 18:56 25992

My Time And Place

(J25992) 11-JUN-75 18:56;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /RWW([ACTION]) JCN([ACTION]) DCE([ACTION]) NRN([ACTION]) DRB([ACTION]) DOCPLAN([INFO-ONLY]) KIRK([INFO-ONLY]) POOH([INFO-ONLY]) BEV([INFO-ONLY]) ; Sub-Collections: SRI-ARC DOCPLAN; Clerk: DVN;

1 25992 Distribution
1a Richard W. Watson, James C. Norton, Douglas C. Engelbart, Norman R. Nielsen, David R. Brown, David R. Brown, Glenn A. Sherwood, N. Dean Meyer, Kathey L. Mabrey, Norman R. Nielsen, Thomas L. Humphrey, Robert Louis Belleville, Elizabeth K. Michael, Richard W. Watson, James C. Norton, Robert N. Lieberman, Pat Whiting O'Keefe, Douglas C. Engelbart, Dirk H. Van Nouhuys, Kirk E. Kelley, Ann Weinberg, Beverly Boli,

Cost of additional graphics figures.

1 As the graphics system is released, users will be requiring figures to be added to the system. The following is an estimate of the cost of these additions. 1

2 The cost per (each and every one) is 8 person hours. This includes: 2

2a Review of the requirement. 2a

2b Design of the graphics instruction data type. 2b

2c Design and implementation of the command syntax. 2c

2d Modification to the graphics routines: 2d

2d1 gbldgi (creates the data structure in the file) 2d1

2d2 gdspgi (displays the graphics instruction from the file) 2d2

2d3 gpclip (pre-clips the diagram to improve efficiency) 2d3

2d4 gmovgi (translates figures) 2d4

2d5 gcopgi (copies figures) 2d5

2d6 x-routines relating to the verification of figure codes 2d6

2e Update of help data base and related documentation 2e

3 In general requirements should be carefully reviewed to insure that the figure requested cannot be more efficiently built as a "template". 3

Cost of additional graphics figures.

(J25993) 12-JUN-75 13:58;;;; Title: Author(s): Robert Louis Belleville/RLB2; Distribution: /DCE([ACTION]) RWW([ACTION]) JCN([ACTION]) JBP([ACTION]) ; Sub-Collections: SRI-ARC; Clerk: RLB2; Origin: < GRAPHICS, GRAPHICS-FIGURES-COST.NLS;1, >, 12-JUN-75 13:53 RLB2 ;;;;####;

1 Introduction 1

1a This list of terms was generated from the information available online in a file built to be read by an automatic question answering system (the "Help command"). In generating this document we have tried to produce a true glossary, to be used for the most part as a dictionary. We imagine readers who are studying other NLS documentation, trying to recall what they have learned in classes or from co-workers, or are working online and want to supplement the Help data base. NLS is a new medium with extensive new terminology. We have tried to explain terms peculiar to NLS, and in some cases explain terms familiar to some computer users but strange to the increasing number coming to NLS without computer background. It is possible to learn about NLS by browsing in this glossary, as it is possible to learn about English by browsing in a dictionary, but only in a somewhat haphazard way. 1a

1b The source of the material and the small size of the vocabulary (in comparison to the number of words in a natural language) limited us in certain ways. One limitation is the size of loops. As in the case of any dictionary, defintions of terms lead to definitions of other terms which in the end lead back to the first term. The size of these loops has been taken as the measure of the power of a dictionary. Because of the limited size and the highly cross-referenced source material, and because we lacked resources to iron them out one by one, the loops are sometimes rather short in this glossary. 1b

1c Those familiar with the hierarchical arrangements characteristic of NLS will understand that it was difficult to level our information out to form an alphabetic list. Commands are a case in point. Should the command "Delete Word" be indexed under Word? under Delete? or under Base, since it is part of the Base Subsystem? In the end we alphabetized all commands under their first word, and added lists of commands under the names of the various subsystems. Because commands to Delete exist in several subsystems, it was necessary to add (BASE) after the reference to Delete to guide the reader in selecting among several entries. 1c

1d A similar problem appears in the names given to variables that appear in only one or a few commands. For example in the "Show Directory" and "Copy Directory" commands a user may optionally choose to see several secondary facts about the file. The choices are called collectively DIROPT in the command syntax. Where should DIROPT appear in the glossary? Since DIROPT appears

in the the syntax of several commands, it appears alphabetically under D. 1d

1e The generation process was in large part automatic and therefore subject to the type of oversights that are easy to program into automatic processes. A few things should be remembered: 1e

1f Some descriptions have references such as "pointing: See pointing". Descriptions cited in this way will be found in alphabetic order (under P in the case of "pointing"). Unless otherwise noted, a command description refers to a command in the BASE subsystem. 1f

1g Comparsion of the content of defintions in the Glossary with those given online by the Help command will reveal differences. In most cases it is because the online version is more up-to-date. 1g

1h This experiment in generating usable offline documentation from a source optimally formatted for online viewing will be repeated in the future with any suggestions and corrections you bring to our attention. Please let us know the forms and media best suited to provide the information you need to learn and use NLS. 1h

2 DEFINITIONS AND CONVENTIONS IN COMMAND SYNTAX

2a Each commandword begins with a capital letter, and the rest is lower case. Words in all upper case are variables, which stand for certain alternativess they are either defined below or in the body of the glossary.

2b Parentheses (....)bound noise words echoed by system; prompts are not shown.

2c / means or

2d SUBSYSTEM = Base / Programs / Sendmail / Calculator / Useroptions

2d1 (These are commandwords)

2e STRING = Character / Word / Visible / Invisible / Number / Link / Text

2e1 (These are commandwords)

2f STRUCTURE = Statement / Group / Branch / Plex

2f1 (These are commandwords)

2g ADDRESS:
a FILEADDRESS and/or an INFILEADDRESS ending with an OK (or just an OK in TNLS for prior location). FILEADDRESS if used must come first. Elements of an INFILEADDRESS, if more than one are used, must be separated by <SP>.

2h DESTINATION:
In TNLS: DESTINATION = ADDRESS.
In DNLS: DESTINATION = BUG / ADDRESS
When referring to Group or Text, two BUGS or two ADDRESSES are needed.

2i SOURCE:
In TNLS: SOURCE = ADDRESS / OPTION TYPEIN
In DNLS: SOURCE = BUG / ADDRESS / OPTION TYPEIN
When referring to Group or Text, two BUGS or two ADDRESSES are needed.

2j CONTENT:
In TNLS: CONTENT = TYPEIN / OPTION ADDRESS
In DNLS: CONTENT = BUG / TYPEIN / OPTION ADDRESS
When refering to Group or Text, two BUGS or two ADDRESSES are needed.

2k TYPEIN = a string of characters from the keyboard, ending with an OK.
TYPEIN has a special form when a FILEADDRESS or Link or Ident is called for. (You can tell from the noise words.)

2l OPTION = the <CTRL-U> character

2m LEvEL-ADJuST:
a lowercase u or d or a string of lowercase u's and d's, optionally preceded by integers, terminated by a <SP> or OK; the difference between the number of u's and d's is taken as a level adjustment value. If you only type a <SP> or OK, the level will be the same.

2n VIEWSPECS:
Type a string of any of the viewspec codes, terminated by an OK, or just type an OK if you don't want to change the viewspecs.

2o ANSWER: Type y for yes or n for no
You may usually type OK here. The command will be immediately executed.

2p OK: CA / OKINSERT / OKREPEAT

2p1 CA: Command Accept: confirms a command or terminates a field within a command.

2p1a DNLS default special character: CA/<CTRL-D>

2p1b TNLS default special character: CR/<CTRL-D>

2p2 OKINSERT: At the end of a command in Base subsystem only, executes the command and starts "Insert Statement" command, defaulting current location. Then you do: LEVEL-ADJUST CONTENT OK. INSERT mode continues until you type CD. In all other cases, OKINSERT has no special meaning; it is equivalent to Command Accept.

2p2a DNLS default special character: <CTRL-E>

2p2b TNLS default special character: <CTRL-E>

2p3 OKREPEAT: At the end of any command, executes it and repeats it from the beginning, defaulting each command-word until reaching the first field not a command-word that you can specify. Then you take over the command. REPEAT mode continues until you type CD. Used elsewhere, OKINSERT has no special meaning; it is equivalent to Command Accept.

2p3a DNLS default special character: <CTRL-B>

2p3b TNLS default special character: <CTRL-B>

2q CD: Command Delete. It aborts a command immediately and will also take you out of INSERT or REPEAT mode.

2q1 DNLS default special character: <CTRL-X>

2q2 TNLS default special character: <CTRL-X>

DRAFT Introduction to NLS 8 Glossary

(J25994) 12-JUN-75 14:06;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /DMB([ACTION] dirt notebook please) DIRT([INFO-ONLY]) ; Sub-Collections: SRI-ARC DIRT; Clerk: DVN; Origin: < VANNOUHUYS, GLOSSYINTRO.NLS;5, >, 12-JUN-75 12:55 DVN ;;;; @####;

.PEL; .PN=PN-1; .GCR;A couple of weeks ago Jim Biar asked that the introduction to the glossary be expanded to give more information to the user that would help her start ing out. Here is a draft. We are in the stage of trial COM proofs of the body of the glossary so I must ask for responses to this draft by Monday June 16.

1 25994 Distribution

1a Delorse M. Brooks, Jonathan B. Postel, Priscilla A. Wold, Rita Hysmith, Pamela K. Allen, Delorse M. Brooks, Elizabeth F. Finney, Beverly Boli, Lawrence A. Crain, Kirk Sattley, Susan Gail Roetter, Robert N. Lieberman, Ann Weinberg, Kenneth E. (Ken) Victor, Douglas C. Engelbart, James H. Bair, Elizabeth K. Michael, Richard W. Watson, Elizabeth J. Feinler, Harvey G. Lehtman, Kirk E. Kelley, Laura E. Gould, Jeanne M. Beck, Dirk H. Van Nouhuys, James C. Norton,

Letter to Bernard Wieder of Dept. of Commerce

1

Bernard Wieder
Office of
Program Development
U.S. Dept. Of Commerce
1325 G. Street N.W.
Washington, DC 20005

Dear Mr. Wieder,

Per your request, I have enclosed several documents which I hope adequately describes our developments to you. The work we have been pursuing for over 13 years is complex and extensive. Thus, it is often difficult to clearly explain the facilities solely in hardcopy.

If I can be of any further help please call me.

In any case, I will expect to hear from you about your trip west sometime this July.

Sincerely yours,

Robert N. Lieberman

Enclosures:

8a <1>
8a1 "Coordinated Information Services for a Discipline- or Mission-Oriented Community," Douglas Engelbart, 12-DEC-72, (mjournal,12445,)

8b <2>
8b1 "The Augmented Knowledge Workshop," Douglas C. Engelbart, Richard W. Watson, and James C. Norton, 1-MAR-73, (ijournal,14724,)

8c <3>
8c1 "Investments in Tomorrow," SRI, No. 14, Winter 1975

8d <4>
8d1 "The SRI-ARC Workshop Utility Service: What and Why," James Norton, 1-OCT-74, (jjournal,24031,)

8e <5>
8e1 "A Research Center for Augmenting Human Intellect," D. C. Engelbart and W. K. English, AFIPS - Conference Proceedings, Volume 33, 1968, (3954,)

8f <6>
8f1 "Online Team Environment: Network Information Center and

Letter to Bernard Wieder of Dept. of Commerce

Computer Augmented Team Interaction," SRI-ARC, June 1972, (13041,) 8f1

Letter to Bernard Wieder of Dept. of Commerce

(J25995) 13-JUN-75 15:36;;;; Title: Author(s): Robert N. Lieberman/RLL; Distribution: /ARC-LOG([INFO-ONLY]) DCE([INFO-ONLY]) JCN([INFO-ONLY]) ; Sub-Collections: SRI-ARC ARC-LOG; Clerk: RLL; Origin: < LIEBERMAN, WIEDER.NLS;7, >, 12-JUN-75 18:54 RLL ;;;; ####;

Letter to Bengt Brynne of ALFA-LAVAL, Sweden: enclosures

Letter to Benot Brynne of ALFA-LAVAL, Sweden: enclosures

2

Benot Brynne
Manager Technical Documentation
ALFA-LAVAL AB
Research and Development Group Staff
Postfack S-147 00
Tumba, Sweden 2

3 Dear Mr. Brynne, 3

4 This letter specifies the documents requested and enclosed, requested but not available, and not requested but thought to be of interest to you. 4

5 Please let me know if I can be of any additional assistance. 5

6

Sincerely yours, 6

7 Robert N. Lieberman 7

8 Enclosures: (numbers refer to your original request list) 8

9 Requested and enclosed 9

9a (8) L G ROBERTS B D WESSLER
The ARPA Network
Advanced Research Projects Agency Information Processing Techniques Washington D C May 1971 (SRI-ARC Catalog Item 7750) 9a

9b (26) D C ENGELBART W K ENGLISH (two copies)
A Research Center for Augmenting Human Intellect
AFIPS Proceedings-Fall Joint Computer Conference Vol 33 pp 395-410 1968 (SRI-ARC Catalog Item 3954) 9b

9c (28) D C ENGELBART
Coordinated Information Services for a Discipline- or Mission-Oriented Community
Stanford Research Institute Augmentation Research Center 12 December 1972 (SRI-ARC Journal File 12445)
Also published in Time Sharing: Past, Present, Future
Proceedings of the Second Annual Computer Communications Conference at California State University, San Jose, California, January 24-25 1973 pp 2.1-2.4 1973 9c

Letter to Bengt Brynne of ALFA-LAVAL, Sweden: enclosures

9d (39)
Online Team Environment: Network Information Center and Computer Augmented Team Interaction
Stanford Research Institute Augmentation Research Center
RADC-TR-72-232 8 June 1972 (SRI-ARC Journal File 13041) 9d

10 Not Available 10

10a (27) D C ENGELBART
Intellectual Implications of Multi-Access Computer Networks
Paper presented at Interdisciplinary Conference on Multi-Access Computer Networks Austin Texas April 1970 Preprint (SRI-ARC Journal File 5255) 10a

10b (29) D C ENGELBART
Augmenting Human Intellect: A Conceptual Framework
Stanford Research Institute Augmentation Research Center
AFOSR-3223 AD-289 565 October 1962 (SRI-ARC Catalog Item 3906) 10b

10c (30) D C ENGELBART B HUDDART
Research on Computer-Augmented Information Management (Final Report)
Stanford Research Institute Augmentation Research Center
ESD-TDR-65-168 AD 622 520 March 1965 (SRI-ARC Catalog Item 9690) 10c

10d (31) D C ENGELBART
Augmenting Human Intellect: Experiments, Concepts, and Possibilities - Summary Report
Stanford Research Institute Augmentation Research Center March 1965 (SRI-ARC Catalog Item 9691) 10d

10e (32) W K ENGLISH D C ENGELBART B HUDDART
Computer Aided Display Control - Final Report
Stanford Research Institute Augmentation Research Center July 1965 (SRI-ARC Catalog Item 9692) 10e

10f (33) D C ENGELBART W K ENGLISH J F RULIFSON
Development of a Multidisplay, Time-Shared Computer Facility and Computer-Augmented Management-System Research
Stanford Research Institute Augmentation Research Center AD 843 577 April 1968 (SRI-ARC Catalog Item 9697) 10f

10g (34) D C ENGELBART
Human Intellect Augmentation Techniques, Final Report
Stanford Research Institute Augmentation Research Center CR-1270 N69-16140 July 1968 (SRI-ARC Catalog Item 3562) 10g

10h (35) D C ENGELBART W K ENGLISH D C EVANS
Study for the Development of Computer Augmented Management

Letter to Bengt Brynne of ALFA-LAVAL, Sweden: enclosures

Techniques - Interim Technical Report
Stanford Research Institute Augmentation Research Center
RADC-TR-69-98 AD 855 579 8 March 1969 (SRI-ARC Catalog Item 9703) 10h

10i (36) D C ENGELBART SRI-ARC STAFF
Computer-Augmented Management-System Research and Development of Augmentation Facility - Final Report
Stanford Research Institute Augmentation Research Center
RADC-TR-70-82 April 1970 (SRI-ARC Catalog Item 5139) 10i

10j (37) D C ENGELBART SRI-ARC STAFF
Advanced Intellect-Augmentation Techniques - Final Report
Stanford Research Institute Augmentation Research Center CR-1827
July 1970 (SRI-ARC Catalog Item 5140) 10j

10k (38) D C ENGELBART
Experimental development of a Small Computer-Augmented Information System - Annual Report
Stanford Research Institute Augmentation Research Center April 1972 (SRI-ARC Catalog Item 10045) 10k

11 Not requested and enclosed 11

11a C H Irby 11a

11a1 Display Techniques for Interactive Test Manipulation, 1973 11a1

11b D I Andrews 11b

11b1 Line Processor: A Device for Amplification of Display Terminal Capabilities for Text Manipulation 11b1

11c M E Hardy, Jr. 11c

11c1 Microprocessor Technology to Extend the Utility of Computer Peripherals 11c1

11d M E Hardy, Jr. 11d

11d1 Workstation Equipment Reference Manual, DRAFT Nov 74 11d1

11e SRI-ARC 11e

11e1 NLS-8 Command Summary, Oct 74 11e1

11f D C Engelbart, R W Watson, and J C Norton 11f

11f1 The Augmented Knowledge Workshop, March 1973 11f1

RLL 16-JUN-75 13:15 25996

Letter to Bengt Brynne of ALFA-LAVAL, Sweden: enclosures

(J25996) 16-JUN-75 13:15;;;; Title: Author(s): Robert N. Lieberman/RLL; Distribution: /JCN([INFO-ONLY]) ARC-LOG([INFO-ONLY]) ; Sub-Collections: SRI-ARC ARC-LOG; Clerk: RLL; Origin: < LIEBERMAN, ALFA-LAVAL.NLS;5, >, 16-JUN-75 13:01 RLL ;;;;####;

KEV 12-JUN-75 16:45 25997

x110 debugging

updates my previous memo (whose number i lost)

x110 debugging

1 this document attempts to describe how to use some of the debugger back end routines from ddt to assist in debugging x110 programs. 1

2 the basic approach consists of editting some files (for address space configuration constarints), compiling some files, loading these files with the files you wish to debug, using tenex ddt to set breakpoints, examine/modify memory, etc., calling procedures that i have provided to display stack frames, records, catchframes, etc. 2

3 detatiled instructions: 3

3a 1) edit the file [bbnb]<victor>symbol.nls as follows: 3a

3a1 the two constants: frstpage & lastpage define the inclusive bounds of pages in the address space to be used as window pages for examining a fork. set these up to point to an unused area in your address space; the larger this area the better; 3a1

3a2 the nsw debugger keeps a copy of the symbol table for the fork it is debugging in its own address space. the size of this area is defined by the constant symzarea. in the special case where you are debugging the same address space as the one in which the debugger lives, this constant can get set to some small token amount to conserve space in your adr space, since the debugger does not in this special case get a duplicate copy of the symbol table. 3a2

3a3 (all these constants are statement names so it should be easy to find them) 3a3

3b 2) compile the following files using x110 to whatever rel files you like: 3b

3b1 [bbnb]<victor>symbol.nls % as editted above % 3b1

3b2 [bbnb]<victor>110ddt.nls 3b2

3b3 [bbnb]<victor>debug.nls 3b3

3c 3) load the above rel files with your rel files 3c

3d 4) this step is optional but recommended for your own convience: 3d

3d1 debugger functions are invoked by the execution of the followings instruction in ddt: 3d1

3d1a pushj s,func 3d1a

3d2 it is impossible in 110 to define a symbol with a 36bit value such that the rightnalf is a relocatable adr. therefore i recommend that in your runfil for loading that after the load is done, you go into ddt and perform the following steps to define shorthand representations for the needed procedure calls (I also recommend that we all use the same shorthands for the obvious reasons) : 3d2

3d2a to define the symbol "sf" to have the value "pushj s,func" type the following to ddt: 3d2a

3d2a1 pushj s,func<sf: 3d2a1

3d2b (see the appendix for a complete list of currently supported functions, recommended shorthands, and arguments reequired.) 3d2b

3e 5) using the debugger 3e

3e1 the procedures in the debugger all assume that a valid 110 environment exists at the time they are called. therfore it is your responsibility to set up this environment before calling any of the debugger procedures. you may then set tenex ddt breakpoints as you wish and call thiese procedures while at the breakpoint by typing the following (for example): 3e1

3e1a stx if you did step 4 above or pushj s,funcx 3e1a

3e2 after hitting a breakpoint if you wish to examine the stack you must call the procedure stop or sfra before calling the procedures snext, sback, sown, or scur 3e2

3f 6) debugger output 3f

3f1 all output is in octal (will be user settable in the nsw debugger) 3f1

3f2 the number of declared formals and number of locals will always be zero, but the number of passed formals to a procedure will be right 3f2

3f3 in displaying a record the field value will always be displayed in octal, and if there is a symbol in the symbol table with the exact value of the field value it will also be displayed symbollically. 3f3

3f4 in displaying a record the size of each field is shown in (octal) bits 3f4

3g 7) where to set breakpoints 3g

3g1 for best results set breakpoints at the following places: 3g1

3g1a procedure-name + 1 3g1a

3g1b coroutine-name + 3 3g1b

3g1c after a pcall after the store of the calling frame port id (this is usually a movem 8,-1(M) inst after a jsp a4,pcall inst) 3g1c

4 i believe that the debugger does not clobber anything and that it works, but please understand that it is still under development, please advise me of any problems you run into 4

5 my current plans call for me to work on a higher level in the debugger, but am open for suggestion if you would like other primitives (e.g. show list) that would assist in your current debugging 5

6 APPENDIX - currently supported functions 6

6a each function will be listed by showing first the function name, then the longhand calling sequence, then the recommended shorthand symbol, and finally a description of globals (if any) that need to be set up and the function performed by this procedure. 6a

6b stop - pushj s,stop - st 6b

6b1 this procedure shows the current top of stack frame 6b1

6c sfra - pushj s,sfra - sf 6c

6c1 this procedure displays the stack frame whose mark is in the global "frame" (frame should not be changed by anything the debugger does so it should live accross breakpoints) 6c1

6d scur - pushj s,scur - sc 6d

6d1 this procedure will display the current stack frame, the current stack frame is the frame that was last displayed by the debugger in its current instance, this procedure is useful if you have performed other functions and can no longer see the current frame on a display screen 6d1

6e sback - pushj s,sback - sb 6e

6e1 this procedure will show the stack frame for the routine that called the routine whose stack frame is the current frame 6e1

6f sown - pushj s,sown - so 6f

6f1 this procedure will show the stack frame for the routine that owns the current routine. if the current routine is a coroutine, then this procedure will show its owner; if the current routine is a procedure, then this procedure is equivalent to sback 6f1

6g snext - pushj s,snext - sn 6g

6g1 this procedure is the inverse of sback 6g1

6h spar - pushj s,spar - sp 6h

6h1 this procedure will show the passed formals to a procedure. in the future it will show the maximum of passed/declared formals for a procedure and the declared formals for a coroutine 6h1

6i scat - pushj s,scat - scp 6i

6i1 this procedure will show the invoked cathphrases for the current frame. the most recently invoked cathphrase will be the last displayed catchphrase. the address preceding the colon in the display is the address on the system catchframe stack for this catchphrase. 6i1

6j sstr - pushj s,sstr - ss 6j

6j1 this procedure will display the string whose address is in the global csname. (csname should not change by anything the debugger does.) 6j1

6k srec - pushj s,srec - sr 6k

6k1 this procedure will display the instance of the record whose name is in the 110 global string crname and whose instance address is in the global cradr. (neither cradr or crname will change by anything the debugger does.) (note that crname is an 110 string and must have valid 110 string syntax.) 6k1

6l ssig - pushj s,ssig - ssg 6l

6l1 this procedure will display the current signal status. to make best use of this function, set a breakpoint at bptctn. the active catchphrase displayed will then be the catchphrase

that will be dispatched (activated) upon continuing from the breakpoint at bptctn 611

x110 debugging

(J25997) 12-JUN-75 16:45;;;; Title: Author(s): Kenneth E. (Ken) Victor/KEV; Distribution: /NPG([INFO-ONLY]) ; Sub-Collections: SRI-ARC NPG; Clerk: KEV; Origin: < VICTOR, DOC-DEBUGGER.NLS;1, >, 12-JUN-75 13:39 KEB ;;;;#####;

JAKE 12-JUN-75 18:12 25998

What's my line???

1 Now that code has been successfully excuted so that one can set one's display line width to be 72, it is inte4resting to note than output quickprint has changed it s default line width to 71. Can anyone explain the logic of this to me. Also is there any chance of changing quickprint back to the 72 default as advertised by KEV a short time ago. 1

JAKE 12-JUN-75 18:12 25998

What's my line???

(J25998) 12-JUN-75 18:12;;;; Title: Author(s): Elizabeth J. Feinler/JAKE; distribution: /FEEDBACK([ACTION]) JDH([ACTION]) SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC FEEDBACK; Clerk: JAKE;

BEV 12-JUN-75 18:39 25999

Rethinking the Sendmail sample sessions

1 I started to work on the Sendmail sample session II today, and feel that we need to reconsider whether or not we need it. (Already discussed this with Kirk some>) This is the SS that is subtitled Reading the Mail. The commands to be included are Print Journal; Print Branch; Print File; Jump Link. The first consideration is that it would be hard to teach this session since you cannot count on a certain piece of mail being in the user's file. (This could be side-stepped I imagine.) More importantly, Print Journal would be very infrequently used. Print Branch and Print File are taught in the Editing sample sessions. This leaves only Jump Link, which would probably belong just as well in the Viewing Sample Session. A further consideration is that Kirk's Readmail thing is going to totally obsolete all of this, and sine that will be coming up before toooooo long (?), perhaps we could use the time for writing the ss on reading mail under the present system in a more useful way. Like to hear from you on this asap. Bev 1

BEV 12-JUN-75 18:39 25999

Rethinking the Sendmail sample sessions

(J25999) 12-JUN-75 18:39;;;; Title: Author(s): Beverly Boli/BEV;
Distribution: /DVN([ACTION]) KIRK([ACTION]) POOH([ACTION]) ;
Sub-Collections: SRI-ARC; Clerk: BEV;

BEV 12-JUN-75 20:16 26000

hi

1 Hi. Fascinating mail to receive on a Friday morning isn't it? I had to practice sending a message for one of my sample sessions, so you two get to be the guinia pigs (sp?). How about lunch today?
Your friend, Bev 1

BEV 12-JUN-75 20:16 26000

hi

(J26000) 12-JUN-75 20:16;;;; Title: Author(s): Beverly Boli/BEV;
Distribution: /PKA([ACTION]) PAW([INFO-ONLY]) ; Sub-Collections:
SRI-ARC; Clerk: BEV;

BEV 12-JUN-75 20:22 26001

ooops

1 Sorry about previous message. Please disregard. It was to a different PAW. But hi just the same. Bev 1

BEV 12-JUN-75 20:22 26001

ooops

(J26001) 12-JUN-75 20:22;;;; Title: Author(s): Beverly Boli/BEV;
Distribution: /PAW([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk:
BEV;

BEV 12-JUN-75 20:31 26002

hello

1 Good morning Priscilla. I tried to send you a message a few minutes ago, but didn't realize that you were PAW2 rather than PAW. It was a rather silly message, since I was just goofing around because I needed a transcript for one of my sample sessions. The result was that Paul Wintz at Purdue Univ. will be greeted by a bit of giddiness tomorrow morning. And now so will you too. How about lunch today? Bev 1

BEV 12-JUN-75 20:31 26002

hello

(J26002) 12-JUN-75 20:31;;;; Title: Author(s): Beverly Boli/BEV;
Distribution: /PAM2([ACTION]) ; Sub-Collections: SRI-ARC; Clerk:
BEV;

DVN 12-JUN-75 22:55 26004

Journal Delivery Problem

1 I've started getting items I send both as author iand in my "journal" branch. 1

DVN 12-JUN-75 22:55 26004

Journal Delivery Problem

(J26004) 12-JUN-75 22:55;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /FEEDBACK([ACTION]) JDH([INFO-ONLY]) JCP([INFO-ONLY]) ; Sub-Collections: SRI-ARC FEEDBACK; Clerk: DVN;

RWW 13-JUN-75 11:45 26005

Requirements for any Future Protocol Meeting and Notes for Carlson

1 Bill, 1

1a A couple of comments on the current meeting and requirements for future Protocol meetings. Most of the meeting has been involved usefully in bringing (or starting to bring) the second wave of NSW participants up to speed and while attention finally turned yesterday to the detailed issues about file transfer in NSW, most discussion has been on the new guys trying to find out about high level NSW goals, wanting to know what the WM is and how it is being designed and meets these goals and finally asking similar questions about the Protocols. 1a

1b Most of the Protocol discussion at the DPS level (I think they will all agree on the file stuff today) was at the wrong level or on wrong issues. It was much like looking at a tractor design to see if it could plow, haul wagons etc. and instead of looking at structural features, everybody focused on the size of the chrome around the headlights and how many knobs should be on the dash board. 1b

1c Nothing has been said yet to change my view that the DPS work is not dead center on NSW requirements. It is probably off in 10% (which is where the discussion rightfully gets focused but also has the danger of people losing perspective on the correct 90%)in the sense there are some primitives missing to cover needs that were not clear before and are coming out now that the TBH people are getting involved, contains some small number of primitives that are not needed with similar comments on arguments., and should be defined in terms of subsets needed for implementation on the 11 for the FE, on TBHs, on hosts supporting WMs etc. 1c

1d As an aside, while it occurs to me, Charles showed Raj what we were doing with the Frontend and he got very turned on and is going to go back and seriously consider writing a CLI to use the output of CML to be a Frontend for Multics. Related to our discussion of yesterday and earlier I still think the right NSW strategy for getting straight from 360's etc to tools is to use the strategy recommended to have real NSW Frontends on the desired machines. I think the cost to move it is in the 2-3 man year area possibly even less and thats very small relative to all other costs involved and benifits to be gained. 1d

1e Now about future Protocol meetings. I think they are needed but to be really fruitful and meet your our and others needs I would recommend that the following requirements be satisfied before having them. 1e

1e1 1)The current DPS and its integration with FE WM and NLS BE be working so we do not have to have and question about whether

it will work in anyones minds and it is clear what if any problems exist that can either be fixed or cannot because they are imbedded in the DPS structure. 1e1

1e2 2) Someone be charged with creating specifications on NSW, WM, FE TBH with appropriate dialog and review so all people who will review Protocols understand and agree to these requirements. 1e2

1e3 3) We produce a document that shows how or how not we feel what we have done meets these requirements . 1e3

1e4 4) Jon work closely with BBN, MIT CCN MCA and whoever to be sure they are getting or staying up to speed in the Protocol area relative to current vector. 1e4

1f I am glad you were here for the week and felt a lot of useful exchange took place. Finally I continue to feel the NSW is headed right, the basic design of the whole while not yet adequately documented is sound and will shortly demonstrate to the satisfaction of all that it works as planned. We just need to sharpen up all the various communications from top down and bottem up. Best Dick 1f

RWW 13-JUN-75 11:45 26005

Requirements for any Future Protocol Meeting and Notes for Carlson

(J26005) 13-JUN-75 11:45;;;; Title: Author(s): Richard W. Watson/RWW; Distribution: /DCE([INFO-ONLY]) CHI([INFO-ONLY]) JEW([INFO-ONLY]) JBP([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: RWW;

Updating on Travel and Vacation Dates

1 As of today, I plan to leave for Gunter July 8, spend July 9-11 in Gunter and then return to Califronia. I will spend the next week here (14-18), I will spend the following week (21-25) on vacation, and on Monday July 28, I will go to Washington. I will spend at least two days there depending on what needs to be done. I will then return to ARC. If anyone finds this plan not suitable, please let me know as soon as possible so I can make other arrangements. 1

POOH 16-JUN-75 11:05 26006

Updating on Travel and Vacation Dates

(J26006) 16-JUN-75 11:05;;;; Title: Author(s): Ann Weinberg/POOH;
Distribution: /RWW([ACTION]) DVN([ACTION]) BEV([ACTION])
JCN([INFO-ONLY]) KIRK([INFO-ONLY]) EKM([INFO-ONLY]) ;
Sub-Collections: SRI-ARC; Clerk: POOH;

Response to 32695 Viewgraphs for User Services

1 Response to Viewgraphs Proposal: 1

1a I think the information you want to get across with viewgraphs is great and something that is certainly needed. I am not sure I know what a viewgraph is. Is it something to be used with an overhead projector? If so, I also think that copies should be made available to users since there is alot of useful information. I especially like the idea of a command matrix. That is something that was on one of the old cue cards and I think it is very helpful. 1a

1b I do think, however, it would be too bad if we duplicated efforts..that is perhaps some of the things we are doing for NSW can be used by applications. Two things come to mind immediately. There is the Preface to NLS which I know Susan and Jim have seen. There are two viewgraph items in there: an outline and an explanation of command syntax. Maybe we can incorporate them somehow. Also, BEV just wrote a really nice scenario on Help and thAt might be good for you all to use. She has also done some things on viewing files and on Sendmail. I would like to propose setting up some sort of meeting in the next week or so so that we can really get caught up on what we are all doing and what we plan to do. I am not sure when Jeanne and Susan will both be here, but before I go to Gunter (7/8) would be the best. 1b

Response to 32695 Viewgraphs for User Services

(J26007) 16-JUN-75 12:02;;;; Title: Author(s): Ann Weinberg/POOH;
Distribution: /SGR([ACTION]) JMB([ACTION]) JHB([ACTION])
DVN([ACTION]) BEV([ACTION]) KIRK([ACTION]) ;
Sub-Collections: SRI-ARC; Clerk: POOH;

NSW Review, Pecgress on Sample Sessions, Several items to COM:
Documentation Informal Weekly Report

1 POOH 1

1a prepared and gave demonstration on graphics for Carlson, Crain etc. meetings, meetings, meetings on NSW things 1a

1b cue card was reviewed and it is being reprinted due to an error in the print shop 1b

2 Bev 2

2a Worked on COM directives for Edit I Sample Session some more. Dirk sent it off for another try. 2a

2b Attended demo/meetings with Carlson and Crain. 2b

2c Finished up first draft of Edit III SS. Put in initial review changes, except for issue to be resolved with Jim B. and Susan. 2c

2d Began writing Sendmail SS II. This is now what was proposed as SEndmail SS III, but it was decided not to do Sendmail II as described in Sec. Func. Guide outline. Instead the Jump Link command stuff will go into the Viewing SS. The rest is already covered elsewhere. 2d

3 Kirk 3

3a Looked at the existing help search code. Changed _ to < for going back (_ will work too). 3a

3b Continued to de-bug AFMFORMAT and New Userop tab commands. Sent com test of AFMFORMAT to ISI. 3b

3c Demonstrated a few silver bb's. 3c

3d Made note of several things which need to be updated in ARC tool interface file. 3d

3e My ARC do and done list is in <BBNB,KKELLEY,DO,> and <OFFICE-1,KELLEY,DO,> 3e

4 DvN: 4

4a NSW: Met on various occasions with Bill Carlsen and Larry Crain to review (journal, 25975,) and plan user documentation for NSW, and to discuss using NLS for documentation purposes at the Airforce Data Services Center and allied developments. Wrote most of the Formating Sample Session. Worked on responding to Applications Review of Introduction to Document Production, the

NSW Review, Pecgress on Sample Sessions, Several items to COM:
Documentation Informal Weekly Report

NLS Preface. See also dialog with Kirk Satterly: (journal 25986,) and (journal,25991,). 4a

4b COM: Firday morning I put on tape at ISI the final version of the Introduction to Document Production through NLS (dpcsintro.com;1), a new draft of the first editing Sample Session (edicom.com;1) the revised Output Processor User's Guide (op-guide.com;1) and a sample formatted in the Airforce Manuals format (VIX9.com;1). They are on either tape 113 or 112, the operator could not read the label. I called DDSI and asked Ted Spires to pick them up and fix the label. 4b

4c Final report: The crew continues to read in SRI edits. 14 of the 18 affected sections are done. Still need to collect and make space for all illustrations. Should have a Tuesday night. 4c

4d Glossary: Waiting proofs from DDSI. 4d

DVN KIRK POOH BEV 16-JUN-75 12:12 26008

NSW Review, Pecgress on Sample Sessions, Several items to COM:
Documentation Informal Weekly Report

(J26008) 16-JUN-75 12:12;;;; Title: Author(s): Dirk H. Van Nouhuys, Kirk E. Kelley, Ann Weinberg, Beverly Boll/DVN KIRK POOH BEV;
Distribution: /DMB([ACTION] dirt notebook please) DIRT([INFO-ONLY]) ; Sub-Collections: SRI-ARC DIRT; Clerk: DVN;

RLL 16-JUN-75 15:19 26009

CONTACT: AMC, Shirley Martin on 14 June 75

1 (AMC) Contact report 26009 1

1a (DATE) 14 June 75 1a

1b (BY) Lieberman 1b

1c (ATTENDEES) 1c

1c1 Shirley Martin of AMC-HQ 1c1

1c2 Robert Lieberman of SRI-ARC 1c2

1d (ADDRESSES) Full name of organization, address, and phone number 1d

1e (MEDIUM) FACE-TO-FACE 1e

1f (WHERE) Menlo Park, CA 1f

1g (ACTION-ITEMS) 1g

1g1 JCN/RLL to decide on proposal duration. 1g1

1h (DISTRIBUTION) ARC-LOG DCE JCN RLL 1h

1i (REFERENCES) 1i

1j (DOCUMENTS) Hard copy given and received 1j

1j1 (GIVEN) Date and documents given 1j1

1j1a Copy of AMC proposal 1j1a

1j2 (RECEIVED) Date and documents received 1j2

1k (REMARKS) 1k

1k1 Shirley stopped in to visit Saturday on the way back to Washington, DC. Her purpose was to clarify the proposal that we recently sent AMC-HQ. 1k1

1k2 She did not know if AMC would buy three or two slots. The third slot is still up in the air. They should know in a few weeks. 1k2

1k3 Shirley did not know the exact route of the funds (via BRL to RADC, perhaps). 1k3

1k4 More importantly, she was surprised to see that the

CONTACT: AMC, Shirley Martin on 14 June 75

proposal was only for six months. It seemed that they have the money for a full year worth of service starting in July. The prospect of having another contract starting in January of 1976 did not seem particular good to her. The likelihood of a year contract starting in January 1976 is very low. This is due to the fiscal year funding. 1k4

1k5 We decided to explore the following four options. 1k5

1k5a Modification of the recent proposal to be a year starting in July 1k5a

1k5b A year proposal starting in January 1976 1k5b

1k5c A six month proposal starting in January 1976 1k5c

1k5d A 18 month proposal starting in July 1975 1k5d

1k6 I, of course, indicated the problems or advantages with each option. 1k6

1k7 One possible problem, especially for the third slot, is that the funding is coming from various Army sources. This might delay actual transfer of funds until a date beyond 18 July. Shirley wondered if we could still set up directories, etc. I indicated that it depended upon exactly were the contract stood more than actual money transfer. 1k7

RLL 16-JUN-75 15:19 26009

CONTACT: AMC, Shirley Martin on 14 June 75

(J26009) 16-JUN-75 15:19;;;; Title: Author(s): Robert N. Lieberman/RLL; Distribution: /JCN([ACTION]) ARC-LOG([INFO-ONLY]) DCE([INFO-ONLY]) JCN([INFO-ONLY]) RLL([INFO-ONLY]) ; Sub-Collections: SRI-ARC ARC-LOG; Clerk: ALOG;

Output Processor, Document Production, and Editing Documentation, and Airforce Manuals Format to COM.

1 Friday morning I put on tape at ISI the final version of the Introduction to Document Production through NLS (dpcsintro.com;1), a new draft of the first editing Sample Session (edicom.com;1) the revised Output Processor User's Guide (op-guide.com;1) and a sample formatted in the Airforce Manuals format (VIX9.com;1). They are on either tape 113 or 112, the operator could not read the label. I called DDSI and asked Ted Spire to pick them up this morning and fix the label. 1

DVN 16-JUN-75 12:18 26010

Output Processor, Document Production, and Editing Documentation, and Airforce Manuals Format to COM.

(J26010) 16-JUN-75 12:18;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /DMB([ACTION] dpcs and dirt notebooks pleas) DPCS([INFO-ONLY]) ; Sub-Collections: SRI-ARC DPCS; Clerk: DVN;

BEV 16-JUN-75 13:02 26011

1 Good morning. I'm practicing using the Sendmail command. Hope you have a pleasant day. 1

(J26011) 16-JUN-75 13:02;;;; Title: Author(s): Beverly Boli/BEV;
Distribution: /BEV([ACTION]) POOH([INFO-ONLY]) ;
Sub-Collections: SRI-ARC; Clerk: BEV;

1 good afternoon. The sendmail command is working. 1

(J26012) 16-JUN-75 16:57;;;; Title: Author(s): Ann Weinberg/POOH; Distribution: /BEV([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: POOH;

My visit

1 < VANNOUHUYS, ONETEST.NLS;13, >, 28-APR-75 23:55 DVN ;;;;(;
EXTERNAL LINKS: <vannouhuys,dvn,> 1

1a This is a sentence. This is another sentence to test automatic editing. this is not another sentence. Too many spaces are here. 1a

1b This is a sentence. This is another sentence to test automatic editing. this is not another sentence. Too many spaces are here. 1b

1c A blue dog ratted when the sun flew over the hedgerow. 1c

1c1 Tiny Fungi Eat gas and oil. 1c1

1d Putative Martian organisms which flourished in the ageuous epoch may now be in cryptobiotic repose. 1d

1e Following Matsubara, temperature plays the role of an imagenary time. 1e

1f When anarchy comes to power and I am King, I will outlaw hierarchy. 1f

1g A blue dog ratted when the sun flew over the hedgerow. 1g

1g1 Tiny Fungi Eat gas and oil. 1g1

1h Putative Martian organisms which flourished in the ageuous epoch may now be in cryptobiotic repose. 1h

1i Following Matsubara, temperature plays the role of an imagenary time. 1i

1j When anarchy comes to power and I am King, I will outlaw hierarchy. 1j

DVN 16-JUN-75 17:29 26013

My visit

(J26013) 16-JUN-75 17:29;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /DCE([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: DVN;

1 N 1

(J26014) 16-JUN-75 17:30;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Sub-Collections: SRI-ARC; Clerk: DVN;

1 N 1

(J26015) 16-JUN-75 17:32;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Sub-Collections: SRI-ARC; Clerk: DVN;

Debugging

1 If debugging is the process of taking errors out, then coding is the process of putting them in. [Gerald M. Weinberg] 1

Debugging

(J26016) 16-JUN-75 20:34;;;; Title: Author(s): Jonathan B. Postel/JBP; Distribution: /SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: JBP;

Debugging

1 Debugging is the point when you no longer pretend you are on schedule. [Gerald M. Weinberg] 1

Debugging

(J26017) 16-JUN-75 20:36;;;; Title: Author(s): Jonathan B. Postel/JBP; Distribution: /SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: JBP;

JBP 16-JUN-75 20:40 26018

Thanks

1 I would like to thank all who helped with our various discussions and demonstrations for our visitors last week. --jon. 1

JBP 16-JUN-75 20:40 26018

Thanks

(J26018) 16-JUN-75 20:40;;;; Title: Author(s): Jonathan B. Postel/JBP; Distribution: /SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: JBP;

KIRK 17-JUN-75 01:41 26019

Bad files show up with compile procedure in GNLS via 'SYSTEM ERROR' message

While typing this message on LSI ELF terminal 'undefined LP code - lpgetchar' occured deleting everything I typed.

KIRK 17-JUN-75 01:41 26019

Bad files show up with compile procedure in GNLS via 'SYSTEM ERROR' message

1 Compile procedure in GNLS caused "SYSTEM ERROR". Using NLS the problem went away. Using GNLS, it appeared at another time. Verify File and Update Compact in GNLS both said "bad file". Delete modifications fixed it. 1

2 Jump (to) File Return immediately thereafter caused ILLEGAL INSTRUCTION unassigned JSYS 30. 2

KIRK 17-JUN-75 01:41 26019

Bad files show up with compile procedure in GNLS via 'SYSTEM ERROR' message

(J26019) 17-JUN-75 01:41;;;; Title: Author(s): Kirk E. Kelley/KIRK; Distribution: /HGL([ACTION]) EKM([INFO-ONLY]) KLM([INFO-ONLY]) DSM([INFO-ONLY]) RLB2([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: KIRK;

110 helper

110 helper

1 Data types 1

1a Simple variables 1a

1a1 Simple variables represent one computer word, or 36 bits, of memory. 1a1

1b Arrays 1b

1b1 Multi-word (one-dimensional) array variables may be declared; computer words within them may be accessed by indexing the variable name, with the index enclosed in square brackets []. Indices range from 0 to n-1 with a default of 0. 1b1

1c Text pointers 1c

1c1 A text pointer is an L10 feature used in string manipulation constructions and points between two characters of a string. 1c1

1d Strings 1d

1d1 String variables are a series of words holding text. 1d1

1e Referenced variables 1e

1e1 Referenced variables hold the address of other declared variables of any type. 1e1

1f Lists--<JOURNAL,25692> 1f

1g Stores--L10 supports STACKS and RINGS. 1g

1h Records--a bit-level template that defines the fields of any variable. 1h

2 Unusual symbols 2

2a %commenttext% a comment can occur anywhere a space is legal. 2a

2b _ assigns a value to a declared variable and is really a backarrow. 2b

2c = is used for constant symbol declarations. 2c

2d !_ is used to append a list. 2d

2e # relational symbol meaning not equal to. 2e

2f sy gives the address of y. 2f

2g &refvar unrefs the REF variable(gives the value). 2g

2h [expr] refers to the location whose address is the value of expr. 2h

2i *stringname* refers to the contents of a string. 2i

2j #listname# references a list. 2j

2k !procedurename JSYS procedure name. 2k

2l !uppercaseopcode assembly language instruction. 2l

2m id1.id2 id2 represents field descriptor. 2m

2n ddBn in literals, B indicates octal and n is the number of octal zeros added to the right of the original digits(dd). 2n

3 Program structure 3

3a General--L10 is a procedure-oriented block-structured language with a wide variety of conditionals and iteratives that encourage structured program design. 3a

3b Statements 3b

3b1 Imbedded--the value of a statement is used when a statement is imbedded. 3b1

3b2 Case--the CASE statement or expression is like an IF THEN... ELSE IF... ELSE IF... . 3b2

3c Routines--all arguments and results are one word. 3c

3c1 Procedures 3c1

3c1a Statement--(procname) PROCEDURE (arg1,arg2,...); 3c1a

3c1b Return--RETURN [boolean](res1,res2,res3,...); 3c1b

3c1c Call--res1_procname [boolean](arg1,arg2,...
:res2,res3,...) 3c1c

3c2 Coroutines--a procedure establishes coroutine links via OPENPORT and communicates with the coroutine over the ports via port-calls(PCALL)<JOURNAL,25295;41>. 3c2

4 Nonsequential facilities 4

4a Signals--a mechanism for transfering control and arguments to other procedures in the thread of control<JOURNAL,25295;6d>. 4a

4a1 Signal Types--1.) ABORT is used when a procedure has encountered an unrecoverable error condition. 2.) NOTE is used when passing information up the thread of control. 3). HELP is used when information is required from a routine up the thread of control. 4a1

4a2 Catchphrases--are used to trap(dispatch) a signal and must CONTINUE, RESUME, or TERMINATE according to the current SIGNALTYPE. CATCHPHRASES must be INVOKEd and must have an ENABLE count > 0 to become active upon receiving a signal. CATCHPARAM is a system variable(like SIGNAL and SIGNALTYPE) that provides parameter passing. 4a2

5 Compile-time facilities 5

5a Builtins-- 5a

5a1 ADDR(ESS)= (18 on PDP-10, 16 on PDP-11). 5a1

5a2 CHAR(ACTER)= (7 on PDP-10, 8 on PDP-11). 5a2

5a3 WORD= (36 on PDP-10, 16 on PDP-11). 5a3

5a4 Register names(R0-R15) and accumulators(A1-A4). 5a4

5a5 Id.SIZE--SIZE is the recordsize in words. 5a5

5a6 NULL-LISTS--deallocates run-time allocated storage associated with the local lists of a procedure. 5a6

5b Expressions--can be used to give initial values to declared items(including compile-time constants). 5b

110 helper

(J26020) 17-JUN-75 12:34;;;; Title: Author(s): Larry L. Garlick/LLG; Distribution: /JBP([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: LLG; Origin: < GARLICK, L10HELPER.NLS;4, >, 4-JUN-75 17:40 LLG ;;;;####;

EKM 17-JUN-75 12:50 26021

Tasks Print Files

1 I changed (recfil,outptr) to point at directory arcprinter in NLS, NIC-NLS, and NINE and recompiled. As son as Dave brings up a new system we can use tasks to Print. 1

EKM 17-JUN-75 12:50 26021

Tasks Print Files

(J26021) 17-JUN-75 12:50;;;; Title: Author(s): Elizabeth K. Michael/EKM; Distribution: /NPG([ACTION]) ; Sub-Collections: SRI-ARC NPG; Clerk: EKM;

CONTACT: Midland Bank Executives on 17 June 75

1 (Midland) A contact report 26022 1

1a (DATE) 17 June 1975 1a

1b (BY) Lieberman 1b

1c (ATTENDEES) 1c

1c1 W. G. Kneale - Midland Bank 1c1

1c2 J. A. Brooks - Midland Bank 1c2

1c3 T. E. Crawford - Midland Bank 1c3

1c4 D. C. Fiske - SRI-Europe 1c4

1c5 Robert Lieberman - SRI-ARC 1c5

1d (ADDRESSES) Full name of organization, address, and phone number 1d

1d1 Midland Marine Bank of London 1d1

1e (MEDIUM) FACE-TO-FACE 1e

1f (WHERE) SRI-ARC, Menlo Park, CA 1f

1g (ACTION-ITEMS) 1g

1g1 Actions taken, to be taken, etc., dated 1g1

1h (DISTRIBUTION) ARC-LOG DCE JCN RLL NDM 1h

1i (REFERENCES) 1i

1j (DOCUMENTS) Hard copy given and received 1j

1j1 (GIVEN) Date and documents given 1j1

1j1a "Coordinated Information Services for a Discipline- or Mission-Oriented Community," Douglas Engelbart, 12-DEC-72, (mjournal,12445,) 1j1a

1j1b "The Augmented Knowledge Workshop," Douglas C. Engelbart, Richard W. Watson, and James C. Norton, 1-MAR-73, (ijournal,14724,) 1j1b

1j1c "Investments in Tomorrow," SRI, No. 14, Winter 1975 1j1c

CONTACT: Midland Bank Executives on 17 June 75

1j2 (RECEIVED) Date and documents received 1j2

1k (REMARKS) 1k

1k1 Three executives from the Midland Marine Bank in London were at SRI for a two day visit. Apparently SRI has a large contract (or is about to have a large contract) from this world wide bank. I gave them a demonstration of the system on Tuesday for about 45 minutes. Fiske, director of SRI-Europe, accompanied them. 1k1

1k2 All Midland men seemed knowledgeable in computer technology and were impressed with certain aspects of the workshop we are creating. Unfortunately, they were non-talkers and few questions were asked. 1k2

1k3 Fiske seemed to ask questions that showed some interest on his part. He was particularly interested in the marketing of our system. 1k3

1k4 I would recommend that people like Fiske be made better aware of our work and our marketing plans. 1k4

1k5 Midland does have branches in the United States. 1k5

1k6 W. G. Kneale is the Assistant Chief General Manager, J. A. Brooks is the General Manager Computer Operations, and T. E. Crawford is the Assistant General Manager Computer Operations for Midland Bank. 1k6

RLL 17-JUN-75 20:04 26022

CONTACT: Midland Bank Executives on 17 June 75

(J26022) 17-JUN-75 20:04;;;; Title: Author(s): Robert N. Lieberman/RLL; Distribution: /ARC-LOG([INFO-ONLY]) DCE([INFO-ONLY]) JCN([INFO-ONLY]) RLL([INFO-ONLY]) NDM([INFO-ONLY]) ; Sub-Collections: SRI-ARC ARC-LOG; Clerk: RLL;

DVN 17-JUN-75 15:04 26023

Markers Loop

1 Starting Yesterday (6/16) at BBNB but not office-1 or or ISI C,
when you jump to a marker you go into a loop. 1

DVN 17-JUN-75 15:04 26023

Markers Loop

(J26023) 17-JUN-75 15:04;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /FEEDBACK([ACTION]) JDH([INFO-ONLY]) DSM([INFO-ONLY]) ; Sub-Collections: SRI-ARC FEEDBACK; Clerk: DVN;

DVN 17-JUN-75 15:09 26024

Documentation Meeting Call

1 Lets get 's get together tomorrow (6/18) to report to one another our status on NSW documentation work at 2:00. 1

DVN 17-JUN-75 15:09 26024

Documentation Meeting Call

(J26024) 17-JUN-75 15:09;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /KIRK([ACTION]) BEV([ACTION]) POOH([ACTION]) ; Sub-Collections: SRI-ARC; Clerk: DVN;

RLB2 17-JUN-75 15:16 26025

Functional description of the new mouse/keyset interface.

Request for comments.

Functional description of the new mouse/keyset interface.

1 INTRODUCTION 1

1a In conjunction with the development of the LSI-11 line processor, a serial mouse/keyset interface is being designed and developed. Since the mouse and keyset are central to the operation of display NLS, the mouse/keyset interface has been designed to meet the following criteria. 1a

1a1 a) Low cost. The manufacturing cost of the unit should be held to the lowest value consistant with - 1a1

1a2 b) Flexability. The unit should be designed to provide mouse/keyset information to a broad class of processors with little or no future interface modification. 1a2

2 BASIC DESIGN 2

2a The prototype unit is designed with the following features. 2a

2a1 a) The unit contains a 10 bit a/d converter to encode the position of the two mouse wheels; a 10 bit switch register to sense changes in the 3 mouse buttons, 5 keyset keys, and 2 spare switches; a serial transmitter and receiver to accept and transmit keyboard data from an alphanumeric display along with the mouse and keyset data; a parallel keyboard interface to encode keystrokes from a commercial keyboard connected directly to the unit. 2a1

2a2 b) Either the serial receiver or the parallel keyboard may be used; however, only one configuration may be selected at a time. Data from the keyboard is transmitted from the mouse/keyset unit as 7 bit characters with the 8th bit always OFF. 2a2

2a3 c) Mouse and keyset data are transmitted in the form of 3 two character vectors as follows: 2a3

2a3a char	---------- 1 ----------								---------- 2 ----------						2a3a
2a3b bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1 0 2a3b
2a3c ksi(lsb)	1	0	1	sp1	sp2	mb1	mbc	mbr	1	0	1	ks5	ks4	ks3	ks2 2a3c
2a3d x0(lsb)	1	1	0	x9	x8	x7	x6	x5	1	1	0	x4	x3	x2	x1 2a3d

Functional description of the new mouse/keyset interface.

2a3e 1 1 1 y9 y8 y7 y6 y5 1 1 1 y4 y3 y2 y1 y0(lsb) 2a3e

2a3f where: 2a3f

2a3f1 sp1 and sp2 are the 2 spare switches 2a3f1

2a3f2 mbl, mbc, and mbr are the left, center and right mouse buttons (1=down) 2a3f2

2a3f3 ks5 through ks1 are the keyset keys (rightmost is the least significant) 2a3f3

2a3f4 x9 through x0 is the x coordinate - 0 is at the left (0 to 1023) 2a3f4

2a3f5 y9 through y0 is the y coordinate - 0 is at the bottom (0 to 1023) 2a3f5

2a3g The button vector is sent when ANY switch CHANGES state. 2a3g

2a3h The x and y vectors are sent independently of each other when either value changes from the value last transmitted. That is, x is transmitted when x changes and y is transmitted when y changes. 2a3h

2a3i Keyboard characters (bit 7 off) may be sent BETWEEN the two coordinate or button characters. 2a3i

2a4 d) The logic is contained on a single 8 by 10 inch printed circuit board. The board has the same format as the DEC extended length/quad height board so the module can be plugged into a PDP 8, 10 or 11 to obtain power. In general, no use is made of this edge connector for input and output signals. 2a4

2a5 e) The unit requires about 1.5 amp of +5 vdc and 50Ma at -12 vdc. 2a5

2a6 f) Input and output signals are available through a 34 pin connector (Ansley 609-3400 (ribbon cable connector) Ansley 609-3402 (pc right angle connector)) as follows. 2a6

2a6a	Pin	Function
2a6b	1-14	Parallel keyboard
2a6c	15-17	free

2a6d	18	EIA receiver	2a6d
2a6e	19	EIA transmitter	2a6e
2a6f	20	free	2a6f
2a6g	21	y coordinate pot	2a6g
2a6h	22	x coordinate pot	2a6h
2a6i	23	left mouse button (n.o. to ground)	2a6i
2a6j	24	center mouse button (n.o. to ground)	2a6j
2a6k	25	right mouse button (n.o. to ground)	2a6k
2a6l	26	free	2a6l
2a6m	27-28	ground	2a6m
2a6n	29	ks2 (n.o. to ground)	2a6n
2a6o	30	?	2a6o
2a6p	31	ks1 (lsb)	2a6p
2a6q	32	ks5 (msb)	2a6q
2a6r	33	ks3	2a6r
2a6s	34	ks4	2a6s

3 CONFIGURATIONS 3

3a Two initial configuration are invisioned for the use of the interface. 3a

3b LSI-11 LINE PROCESSOR. 3b

3b1 In the LSI-11 LP configuration, the interface will be plugged directly into the 11 chassis for power and mechanical mounting. The two spare switches will be assigned to the footswitch and system reset functions. Either a parallel keyboard or the keyboard of the alphanumeric display may be utilized. 3b1

3c FRONTEND DNLS TERMINAL CLUSTER. 3c

3c1 In applications where several DNLS displays are to located

"close" to the frontend machine considerable economy can be realized by replacing line processors with the mouse/keyset interface and handling the linprocessor functions in the frontend. For this configuration, the mouse/keyset interface can be mounted in a 10x12x3 inch chassis with its own power supply and connectors. 3c1

4 COST 4

4a The cost of the interface will depend on the manufacturing agreements reached to build the unit; however, the parts cost can be listed as follows: (this is only an estimate) 4a

4a1 p.c. board	$ 82			4a1
4a2 ic's	$100			4a2
4a3 connectors	$ 25			4a3
4a4 chassis and power (stand alone unit)	$100			4a4
4a5 subtotal		$307		4a5
4a6				4a6
4a7 direct labor	$ 40	(4 man hours @ $10)		4a7
4a8 (p.c. board assembly)				4a8
4a9 direct labor	$ 60	(6 man hours @ $10)		4a9
4a10 (stand alone chassis)				4a10
4a11 subtotal		$100		4a11
4a12				4a12
4a13 mouse, keyset, footswitch		$650		4a13
4a14				4a14
4a15 cost of LP module (assuming 100% labor overhead)			$ 937	4a15
4a16 cost of stand alone unit (100% labor overhead)			$1157	4a16

5 STATUS 5

5a Initial design is complete. A printed circuit board has been

layed out and produced. Chip sockets have been installed. Power and ground circuits have been checked and corrections made. 5a

RLB2 17-JUN-75 15:16 26025

Functional description of the new mouse/keyset interface.

(J26025) 17-JUN-75 15:16;;;; Title: Author(s): Robert Louis Belleville/RLB2; Distribution: /CHI([INFO-ONLY]) JBP([INFO-ONLY]) RWW([INFO-ONLY]) JCN([INFO-ONLY]) DCE([INFO-ONLY]) MEH([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: RLB2; Origin: < BELLEVILLE, MOUSE/KEYSET-DESCRIPTION.NLS;1, >, 17-JUN-75 15:06 RLB2 ;;;;####;