DHC 6-NOV-72 16:04 12576

More fun and games with the output processor

Dirk;

1. Is the Output processor front-end, which gives options for form-feeds, etc. (that Engalbart worked on during iccc) available? The OP continues to be a pain, otherwise.

2. The output processor issues line-feeds, rather than cr-lf combinations, which is causing me many problems with output that i channel to a file. help.
tnx. D/

1

DHC 6-NOV-72 16:04 12576

More fun and games with the output processor

(J12576) 6-NOV-72 16:04; Title: Author(s): Crocker, David H./DHC; Distribution: Van Nouhuys, Dirk H./DVN; Sub-Collections: NIC; Clerk: DHC;

DIA 6-NOV-72 11:03 12577

I filled in that sheet online:

Mike: find my resume thingy in (andrews,resume,). Send me a message when you have it so I can delete it. Thanks, Don 1

DIA 6-NOV-72 11:03 12577

I filled in that sheet online:

(J12577) 6-NOV-72 11:03; Title: Author(s): Andrews, Don I./DIA; Distribution: Kudlick, Michael D./MDK; Sub-Collections: SRI-ARC; Clerk: DIA;

DVN 6-NOV-72 9:09 12578

Recall of (journal,10818,) and revision of DD 1473

I have asked Jeff to get back 10818. It was neither archived nor online but had accidently slipped away. That is not supposed to happen to journal itmes... 1

Yes, we will strip in the changes to DD 1473. 2

As you will see I am keeping you in touch with our eforts to get COM under control. 3

DVN 6-NOV-72 9:09 12578

Recall of (journal,10818,) and revision of DD 1473

(J12578) 6-NOV-72 9:09; Title: Author(s): Van Nouhuys, Dirk H./DVN;
Distribution: Jernigan, Mil E., Stone, Duane L./mej dls ;
Sub-Collections: RADC ; Clerk: DVN;

MFA 6-NOV-72 15:55 12579

ARC Environment Special Interest Group Meeting

There will be a meeting of the ARC environment special interest group Wed., Nov.8 at 3:00 in the Parsley room. All interested parties are invited to attend. We hope to plan some major changes for the console area and would appreciate as much feedback as possible. 1

MFA 6-NOV-72 15:55 12579
ARC Environment Special Interest Group Meeting

(J12579) 6-NOV-72 15:55; Title: Author(s): Auerbach, Marilyn F./MFA ; Distribution: Hoffman, Carol B., Lee, Susan R., Michael, Elizabeth K., Dornbush, Charles F., ARC, Guest O., Feinler, Elizabeth J. (Jake), Handbook, Augmentation Research, Kelley, Kirk E., Meyer, N. Dean, Byrd, Kay F., Prather, Ralph, White, James E. (Jim), Vallee, Jacques F., Kaye, Diane S., Rech, Paul, Kudlick, Michael D., Ferguson, Ferg R., Lane, Linda L., Auerbach, Marilyn F., Bass, Walt, Engelbart, Douglas C., Hardeman, Beauregard A., Hardy, Martin E., Hopper, J. D., Irby, Charles H., Jernigan, Mil E., Lehtman, Harvey G., North, Jeanne B., Norton, James C., Page, Cindy, Paxton, William H., Peters, Jeffrey C., Ratliff, Jake, Row, Barbara E., Riet, Ed K. Van De, Van Nouhuys, Dirk H., Victor, Kenneth E. (Ken), Wallace, Donald C. (Smokey), Watson, Richard W., Andrews, Don I./sri-arc ; Sub-Collections: PODAC SRI-ARC; Clerk: MFA ;

A RESEARCH CENTER FOR AUGMENTING HUMAN INTELLECT

SUMMARY 1

This paper describes a multisponsor research center at Stanford Research Institute in man-computer interaction. 1a

For its laboratory facility, the Center has a time-sharing computer (65K, 24-bit core) with a 4.5 megabyte swapping drum and a 96 megabyte file-storage disk. This serves twelve CRT work stations simultaneously. 1a1

Special hardware completely removes from the CPU the burden of display refreshing and input sampling, even though these are done directly out of and into core. 1a1a

The display in a user's office appears on a high-resolution (875-line) commercial television monitor, and provides both character and vector portrayals. A relatively standard typewriter keyboad is supplemented by a five-key handset used (optionally) for entry of control codes and brief literals. An SRI cursor device called the "mouse" is used for screen pointing and selection. 1a1b

The "mouse" is a hand-held X-Y transducer usable on any flat surface; it is described in greater detail futher on. 1a1b1

Special-purpose high-level languages and associated compilers provide rapid, flexible development and modification of the repertoire of service functions and of their control procedures (the latter being the detailed user actions and computer feedback involved in controlling the application of these service functions). 1a2

User files are organized as hierarchical structures of data entities, each composed of arbitrary combinations of text and figures. A repertoire of coordinated service features enables a skilled user to compose, study, and modify these files with great speed and flexibility, and to have searches, analyses data manipulation, etc. executed. In particular, special sets of conventions, functions, and working methods have been developed to air programming, logical design, documentation, retrieval, project management, team interaction, and hard-copy production. 1b

INTRODUCTION 2

In the Augmented Human Intellect (AHI) Research Center at

A RESEARCH CENTER FOR AUGMENTING HUMAN INTELLECT

Stanford Research Institute a group of researchers is developing an experimental laboratory around an interactive, multiconsole computer-display system, and is working to learn the principles by which interactive computer aids can augment their intellectual capability. 2a

The research objective is to develop principles and techniques for designing an "augmentation system." 2b

This includes concern not only for the technology of providing interactive computer service, but also for changes both in ways of conceptualizing, visualizing, and organizing working material, and in procedures and methods for working individually and cooperatively. 2b1

The research approach is stongly empiracal. At the workplace of each member of the subject group we aim to provide nearly full-time availability of a CRT work station, and then to work continuously to improve both the service available at the stations and the aggregate value derived therefrom by the group over the entire range of its roles and activities. 2c

Thus the research group is also the subject group in the experiment. 2d

Among the special activities of the group are the evolutionary development of a complex hardware-software system, the design of new task procedures for the system's users, and careful documentation of the evolving system designs and user procedures. 2d1

The group also has the usual activities of managing its activities, keeping up with outside developments, publishing reports, etc. 2d2

Hence, the particulars of the augmentation system evolving here will reflect the nature of these tasks--i.e., the system is aimed at augmenting a system-development project team. Though the primary research goal is to develop principles of analysis and design so as to understand how to augment human capability, choosing the researchers themselves as subjects yields as available secondary benefit a system tailored to help develop complex computer-based systems. 2d3

This "bootstrap" group has the interesting (recursive) assignment of developing tools and techniques to make it more effective at carrying out its assignment. 2e

Its tangible product is a developing augmentation system to provide increased capability for developing and studying augmentation systems. 2e1

This system can hopefully be transferred, as a whole or by pieces of concept, principle and technique, to help others develop augmentation systems for aiding many other disciplines and activities. 2e2

In other words we are concentrating fully upon reaching the point where we can do all of our work on line--placing in computer store all of our specifications, plans, designs, programs, documentation, reports, memos, bibliography and reference notes, etc., and doing all of our scratch work, planning, designing, debugging, etc., and a good deal of our intercommunication, via the consoles. 2f

We are trying to maximize the coverage of our documentation, using it as a dynamic and plastic structure that we continually develop and alter to represent the current state of our evolving goals, plans, progress, knowledge, designs, procedures, and data. 2f1

The display-computer system to support this experiment is just (at this writing) becoming operational. Its functional features serve a basic display-oriented user system that we have evolved over five years and through three other computers. Below are described the principal features of these systems. 2g

THE USER SYSTEM 3

Basic Facility 3a

As "seen" by the user, the basic facility has the following characteristics: 3a1

12 CRT consoles, of which 10 are normally located in offices of AHI research staff. 3a1a

The consoles are served by an SDS 940 time-sharing computer dedicated to full-time service for this staff, and each console may operate entirely independently of the others. 3a1b

Each individual has private file space, and the group has community space, on a high-speed disc with a capacity of 96 million characters. 3a1c

The system is not intended to serve a general community of time-sharing users, but is being shaped in its entire design toward the special needs of the "bootstrapping" experiment. 3a2

Work Stations 3b

As noted above, each work station is equipped with a display, an alphanumerica keyboard, a mouse, and a five-key handset. 3b1

The display at each of the work stations (see Figure 1) is provided on a high-resolution, closed-circuit television monitor. 3b2

The alphanumeric keyboard is similar to a Teletype keyboard. It has 96 normal characters in two cases. A third-case shift key provides for future expansion, and two special keys are used for system control. 3b3

The mouse produces two analog voltages as the two wheels rotate, each changing in proportion to the X or Y movement over the table top. 3b4

These voltages control--via an A/D converter, the computer's memory, and the display generator--the coordinates of a tracking spot with which the user may "point" to positions on the screen. 3b4a

Three buttons on top of the mouse are used for special control. 3b4b

A set of experiments, comparing (within our techniques of interaction) the relative speed and accuracy obtained with this and other selection devices showed the mouse to be better than a light pen or a joy stick (see Refs. English 2 and English 2). 3b4c

Compared to a light pen, it is generally less awkward and fatiguing to use, and it has a decided advantage for use with faster-scan, write-through storage tube, projection, or multiviewer display systems. 3b4c1

The five-key handset has 31 chords or unique key-stroke combinations, in five "cases." 3b5

The first four cases contain lower- and upper-case letters and punctuation, digits, and special characters.

(The chords for the letters correspond to the binary numbers from 1 to 26.) 3b5a

The fifth case is "control Case." A particular chord (the same chord in each case) will always transfer subsequent input-chord interpretations to control case. 3b5b

In control case, one can "backspace" through recent input, specify underlining for subsequent input, transfer to another case, visit another case for one character or one word, etc. 3b5c

One-handed typing with the handset is slower than two-handed typing with the standard keyboard. However, when the user works with one hand on the handset and one on the mouse, the coordinated interspersion of control characters and short literal strings from one hand with mouse-control actions from the other yields considerable advantage in speed and smoothness of operations. 3b5d

For literal strings longer than about ten characters, one tends to transfer from the handset to the normal keyboard. 3b5d1

Both from general experience and from specific experiment, it seems that enough handset skill to make its use worthwhile can generally be achieved with about five hours of practice. Beyond this, skill grows with usage. 3b5d2

Structure of Files 3c

Our working information is organized into files, with flexible means for users to set up indices and directories, and to hop from file to file by display-selection or by typed-in file-name designations. Each file is highly structured in its internal organization. 3c1

The specific structure of a given file is determined by the user, and is an important part of his conceptual and "study-manipulate" treatment of the file. 3c1a

The introduction of explicit "structuring" to our working information stems from a very basic feature of our conceptual framework (see Refs. Engelbart1 and Engelbart2) regarding means for augmenting human intellect. 3c2

With the view that the symbols one works with are

supposed to represent a mapping of one's associated concepts, and further that one's concepts exist in a "network" of relationships as opposed to the essentially linear form of actual printed records, it was decided that the concept-manipulation aids derivable from real-time computer support could be appreciably enhanced by structuring conventions that would make explicit (for both the user and the computer) the various types of network relationships among concepts. 3c2a

As an experiment with this concept, we adopted some years ago the convention of organizing all information into explicit hierarchical structures, with provisions for arbitrary cross-referencing among the elements of a hierarchy. 3c2b

The principal manifestation of this hierarchical structure is the breaking up of text into arbitrary segments called "statements," each of which bears a number showing its serial location in the text and its "level" in an "outline" of the text. This paper is an example of hierarchical text structure. 3c2b1

To set up a reference link from Statement A to Statement B, one may refer in Statement A either to the location number of B or to the "name" of B. The difference is that the number is vulnerable to subsequent structural change, whereas the name stays with the statement through change in the structure around it. 3c2c

By convention, the first word of a statement is treated as the name of the statement, if it is enclosed in parentheses. For instance, Statement 0 on the screen of Figure 1 is named "FJCC." 3c2c1

References to these names may be embedded anywhere in other statements, for instance as "see (AFI)," where special format informs the viewer explicitly that this refers to a statement named "AFI," or merely as a string of characters in a context such that the viewer can infer the referencing. 3c2c2

This naming and linking, when added to the basic hierarchical form yields a highly flexible general structuring capability. These structuring conventions are expected to evolve relatively rapidly as our research progresses. 3c2c3

For some material, the structured-statement form may be undesirable. In these cases, there are means for suppressing the special formatting in the final printout of the structured text. 3c3

The basic validity of the structured-text approach has been well established by our subsequent experience. 3c4

We have found that in both off-line and on-line computer aids, the conception, stipulation, and execution of significant manipulations are made much easier by the structuring conventions. 3c4a

Also, in working on line at a CRT console, not only is manipulation made much easier and more powerful by the structure, but a user's ability to get about very quickly within his data, and to have special "views" of it generated to suit his need, are significantly aided by the structure. 3c4b

We have come to write all of our documentation, notes, reports, and proposals according to these conventions, because of the resulting increase in our ability to study and manipulate them during composition, modification, and usage. Our programming systems also incorporate the conventions. We have found it to be fairly universal that after an initial period of negative reaction in reading explicitly structured material, one comes to prefer it to material printed in the normal form. 3c4c

File Studying 3d

The computer aids are used for two principal "studying" operations, both concerned with construction of the user's "views," i.e., the portion of his working text that he sees on the screen at a given moment. 3d1

Display Start 3d1a

The first operation is finding a particular statement in the file (called the "display start"); the view will then begin with that statement. This is equivalent to finding the beginning of a particular passage in a hard-copy document. 3d1a1

Form of View 3d1b

The second operation is the specification of a "form" of view--it may simply consist of a screenful of text which sequentially follows the point specified as the display start, or it may be constructed in other ways, frequently so as to give the effect of an outline. 3d1b1

In normal, off-line document studying, one often does the first type of operation, but the second is like a sissors-and-staple job and is rarely done just to aid one's studying. 3d1c

(A third ttype of service operation that will undoubtedly be of significant aid to studying is question answering. We do not have this type of service.) 3d1d

Specification of Display Start 3d2

The display start may be specified in several ways: 3d2a

By direct selection of a statement which is on the display--the user simply points to any character in the statement, using the mouse. 3d2a1

If the desired display start is not on the display, it may be selected indirectly if it bears a "marker." 3d2a2

Markers are normally invisible. A marker has a name of up to five characters, and is attached to a character of the text. Referring to the marker by name (while holding down a special button) is exactly equivalent to pointing to the character with the mouse. 3d2a2a

The control procedures make it extremely quick and easy to fix and call markers. 3d2a2b

By furnishing either the name or the location number of the statement, which can be done in either of two basic ways: 3d2a3

Typing from the keyboard 3d2a3a

Selecting an occurrence of the name or number in the text. This may be done either directly or via an indirect marker selection. 3d2a3b

After identifying a statement by one of the above means, the user may request to be taken directly there for his next view. Alternately, he may request instead that he be taken to some statement bearing a specified structure relationship to the one specifically identified. For instance, when the user identifies Statement 3E4 by one of the above means (assume it to be a member of the list 3E1 through 3E7), he may ask to be taken to 3d2b

Its successor, i.e., Statement 3E5 3d2b1

Its predecessor, i.e., Statement 3E3 3d2b2

Its list tail, i.e., Statement 3E7 3d2b3

Its list head, i.e., Statement 3E1 3d2b4

Its list source, i.e., Statement 3E 3d2b5

Its subhead, i.e., Statement 3E4A 3d2b6

Besides being taken to an explicitly identified statement, a user may ask to go to the first statement in the file (or the next after the current location) that contains a specified word or string of characters. 3d2c

He may specify the search string by typing it in, by direct (mouse) selection, or by indirect (marker) selection. 3d2c1

Specification of Form of View 3d3

The "normal" view beginning at a given location is like a frame cut out from a long scroll upon which the hierarchical set of statements is printed in sequential order. Such a view is displayed in Figure 1. 3d3a

Otherwise, three independently variable view-specification conditions may be applied to the construction of the displayed view: level clipping, line truncation, and content filtering. The view is simultaneously affected by all three of these. 3d3b

Level: Given a specified level parameter, L (L = 1,2, ... , ALL), the view generator will display only those statements whose "depth" is less than or equal to L. (For example, Statement 3E4 is third level, 3E second, 4B2C1 fifth, etc.) Thus it is possible to

see only first-level statements, or only first-second- and third level statements, for example. 3d3b1

Truncation: Given a specification for desired content (written in a special high-level content-analysis language) the view generator optionally can be directed to display only those statements that have the specified content. 3d3b2

One can specify simple strings, or logical combinations thereof, or such things as having the word "memory" within four words of the word "allocation." 3d3b3

Content specifications are written as text, anywere in the file. Thus the full power of the system may be used for composing and modifying them. 3d3b4

Any one content specification can then be chosen for application (by selecting it directly or indirectly). It is compiled immediately to produce a machine-code content-analysis routine, which is then ready to "filter" statements for the view generator. 3d3b5

In addition, the following format features of the display may be independently varied: indentation of statements according to level, suppression of location numbers and/or names of statements, and separation of statements by blank lines. 3d3c

The use controls these view specifications by means of brief, mnemonic character codes. A skilled user will readjust his view to suit immediate needs very quickly and frequently; for example, he may change level and truncation settings several times in as many seconds. 3d3d

"Freezing" Statements 3d4

One may also pre-empt an arbitrary amount of the upper portion of the screen for holding a collection of "frozen" statements. The remaining lower portion is treated as a reduced-size scanning frame, and the view generator follows the same rules for filling it as described above. 3d4a

The frozen statements may be independently chosen or dismissed, each may have line truncation independent of the rest, and the order in which they are displayed is

arbitrary and readily changed. Any screen-select operand for any command may be selected from any portion of this display (including the frozen statements). 3d4b

Examples 3d5

Figures 3 and 4 show views generated from the same starting point with different level-clipping parameters. This example happens to be of a program written in our Machine-Oriented language. 3d5a

Figure 5, demonstrates the freezing feature with a view of a program (the same one shown in Figure 8) written in our Control Metalanguage. Statements 3C, 3C2, 2B, 2B1, 2B2, 2B3, and 2B4 are frozen, and statements from 2J on are shown normally with L = 3, T = 1. 3d5b

The freezing here was used to hold for simultaneous view four different functionally related process descriptions. The subroutines (+BUG1SPEC) and (+WAIT were located by use of the hop-to-name feature described above. 3d5b1

File Modification 3e

Here we use a standard set of editing operations, specifying with each operation a particular type of text entity. 3e1

Operations: Delete, Insert, replace, Move, Copy. 3e1a

Entities (within text of statements): Character, Text (arbitrary strings), Word, Visible (print string), Invisible (gap string). 3e1b

Entities (for structure manipulation): Statement, Branch (statement plus all substructure), Group (sublist of branches), Plex (complete list of branches). 3e1c

Structure may also be modified by joining statements, or breaking a statement into two at a specified point. 3e2

Generally, an operation and an entity make up a command, such as "Delete Word." To specify the command, the user types the first letter of each word in the command; thus "DW" specifies "Delete Word." There are occasional cases where a third word is used or where the first letter cannot be used because of ambiguities. 3e3

File Output 3f

Files may be sent to any of a number of different output devices to produce hard copy--an upper/lower-case line printer, an on-line high-quality typewriter, or paper tape to drive various typewriters. 3f1

In future it will be possible to send files via magnetic tape to an off-line CRT-to-film system fromwwhich we caa produce Xerox prints, Multilith masters, or microform records. 3f1a

Flexible format control may be exercised in this process by means of specially coded directives embeded in the files--running headers, page numbering, line lengths, line centering, suppression of location numbers, indenting, right justification (hyphenless), etc., are controllable features. 3f2

Compiling and Debugging 3g

Source-code files written in any of our compiler languages (see below), or in the SDS 940 assembly language (ARPAS, in which our compiler output is produced) may be compiled under on-line control. For debugging, we have made a trivial addition to the SDS 940's DDT loader-debugger so as to operate it from the CRT displays. Though it was designed to operate from a Teletype terminal, this system gains a great deal in speed and power by merely showing with a display the last 26 lines of what would have been on the Teletype output. 3g1

Calculating 3h

the same small innovation as mentioned above for DDT enables us to use the CAL system from a display terminal. 3h1

Conferencing 3i

We have set up a room specially equipped for on-line conferencing. Six displays are arranged in the center of a square table (see Figure 6) so that each of twenty participants has good visibility. One participant controls the system, and all displays show the same view. The other participants have mice that control a large arrow on the screen, for use as a pointer (with no control function). 3i1

As a quick means of finding and displaying (with

appropriate forms of view) any desired material from a very large collection, this system is a powerful aid to presentation and review conferences. 3i2

We are also experimenting with it in project meetings, using it not only to keep track of agenda items ad changes but also to log progress notes, action notes, etc. The review aid is of course highly useful here also. 3i3

We are anxious to see what special conventions and procedures will evolve to allow us to harness a number of independent consoles within a conference group. This obviously has considerable potential. 3i4

SERVICE-SYSTEM SOFTWARE 4

The User's Control Language 4a

Consider the service a user gets fromthe computer to be in the form of discrete operations--i.e., the execution of individual "service functions" from a repertoire comprising a "service system." 4a1

Examples of service functions are deleting a word, replacing a character, hopping to a name, etc. 4a1a

Associated with each function of this repertoire is a "control-dialogue procedure." This procedure involves selecting a service function from the repertoire, setting up the necessary parameter designations for a particular application, recovering from user errors, and calling for the execution of the function. 4a2

The procedure is made up of the sequence of keystrokes, select actions, etc. made by the user, together with the interspersed feedback messages fro the computer. 4a2a

The repertoire of service functions, together with their control-dialogue procedures, constitutes the user's "control language." This is a language for a "master-slave" dialogue, enabling the user to control application of the computer's capabiliies to his own service. 4a3

It seems clear that significant augmentation of one's intellectual effectiveness from the harnessing of computer services will require development of a broad and sophisticated control-language vocabulary. 4a3a

It follows that the evolution of such a control language is a very important part of augmentation-system research. 4a3b

For the designer of user systems, it is important to have good means for specifying the nature of the functions and their respective control-dialogue procedures, so that a design specification will be 4a4

Concise, so that its essential features are easily seen 4a4a

Unambiguous, so that questions about the design may be answered clearly 4a4b

Canonical, so that informtion is easily located 4a4c

Natural, so that the form of the description fits the conceptual frame of the design 4a4d

Easy to compose, study, and modify, so that the process of evolutionary design can be facilitated. 4a4e

It is also important for the userr to have a description of the service functions and thier control-dialogue procedures. 4a5

The description must again be concise, unambiguous, canonical, and natural; furthermore, it must be accurate, in that everything relevant to the user about the service functions and their control-dialogue procedures is described, and everything described actually works as indicated. 4a5a

State-Chart Representation of Connrol-Language Design 4b

Figure 7 shows a charting method that was used in earlier stages of our work for designing and specifying the control-procedure portions of the control language. Even though limited to describing only the control-dialogue procedures, this representation nonetheless served very well and led us to develop the successive techniques described below. 4b1

Figure 7 shows actual control procedures for four service functions frm te repertoire of an interactive system: Delete Word, Delete Text, Place Up Statement, and Forward Statement. 4b2

The boxes contain abbreviated descriptons of relevant display-feedback conditions, representing the intermediate states between successive user actions. Both to illustrate how the charting conventions are used and to give some feeling for the dynamics of our user-system control procedures, we describe briefly below both the chart symbols and the associated display-feedback conventions that we have developed. 4b2a

The writing at the top of each box indicates what is to be shown as "command feedback" at the top of the display. 4b2a1

An uparrow sometimes appears under the first character of one of the words of Command Feedback. 4b2a1a

This indicates to the user that the next character he types will be interpreted as designating a new term to replace that being pointed to--no uparrow under Command Feedback signifies that keyboard action will not affect the command designation. 4b2a1a1

"Entity" represents the entity word (i.e., "character," "word, "statement," etc.) that was last used as part of a fully specified command. 4b2a1b

The computer often "offers" the user an entity option. 4b2a1b1

The circle in the box indicates the character to be used for the "bug" (the tracking spot), which alternates between the characters uparrow and plus. 4b2a2

The uparrow indicates that a select action is appropriate, and the plus indicates that a select action is inappropriate. 4b2a2a

The string of X's with underlines, indicates that the selected characters are to be underlined as a means of showing the user what the computer thinks he has selected. 4b2a3

There is frequently an X on the output line from a box on the chart. This indicates that the computer is to wait until the user has made another action. 4b2b

After this next action, the computer follows a

branching path, depending upon what the action was (as indicated on the chart) to reach another state-description box or one of the function-execution processes. 4b2b1

The Control Metalanguage 4c

In search for an improvement over the state chart, we looked for the following special features, as well as the general features listed above: 4c1

A representational form using structural text so as to harness the power of our on-line text-manipulation techniques for composing, studying, and modifying our designs. 4c1a

A form that would allow us to specify the service functions as well as the control-dialogue procedures. 4c1b

A form such that a design-description file could be translated by a computer program into the actual implementation of the control language. 4c1c

Using our Tree Meta compiler-compiler (described below), we have developed a next step forward in our means of designing, specifying, implementing and documenting our on-line control languages. The result is called "Control Metalanguage" (CML). 4c2

Figure 8 shows a portion of the description for the current control language, written in Control Metalanguage. 4c2a

This language is the mean for describing both the service functions and their control-dialogue procedures. 4c2a1

The Control Metalanguage Translator (CMLT) can process a file containing such a description, to produce a corresponding version of an interactive system which responds to user actions exactly as described in the file. 4c2b

There is a strong correspondence between the conventions for representing the control procedures in Control Metalanguage and in the state chart, as a comparison of Figures 8 and 7 will reveal. 4c3

The particular example printed out for Figue 8 was chosen because it specifies some of the same procedures as in Figue 7. 4c3a

For instance, the steps of display-feedback states, leading to execution of the "Delete Word" function, can readily be followed in the state chart. 4c3b

The steps are produced by the user typing "D," then "W," then selecting a character in a given word, and then hitting "command accept" (the CA key). 4c3b1

The corresponding steps are outlined below for the Control Metalanguage description of Figure 8, progressing from Statement 3, to Statement 3c, to Statement 3c2, to Subroutine + BUG-SPEC, etc. 4c3b2

The points or regions in Figure 7 corresponding to these statements and subroutines are marked by (3), (3C), (3C2), and (+BUG1SPEC), to help compare the two representations. 4c3b3

These same steps are indicated in Figure 8, starting from Statment 3: 4c3c

"D" sets up the state described in Statement 3C 4c3c1

"W" sets up the state described in Statement 3C2 4c3c2

The subroutine +BUG1SPEC waits for the select-word (1) and CA (2) actions leading to the execution of the delete-word function. 4c3c3

Then the TWDR subroutine takes the bug-position parameter and sets pointers P1 through P4 to delimit the word in the text data. 4c3c3a

Finally, the + DEL subroutine deletes what the pointers delimit, and then returns to the last-defined state (i.e., to where S* = DW). 4c3c3b

Basic Organization of the On-Line System (NLS) 4d

Figure 9 shows the relationships among the major components of NLS. 4d1

The Tree Meta Translator is a processor specially designed to produce new translators. 4d2

There is a special language--the Tree Meta Language--for use in describing the translator to be produced. 4d2a

A special Tree Meta library of subroutines must be used, along with the output of the Tree Meta Translator, to produce a functioning new translator. The same library serves for every translator it produces. 4d2b

For programming the various subroutines used in our 940 systems, we have developed a special Machine-Oriented Language (MOL), together with an MOL Translator to convert MOL program descriptions into machine code (see Ref. Hay1 for a complete description). 4d3

The MOL is designed to facilitate system programming, by providing a high-level language for iterative, conditional, and arithmetic operations, etc., along with a block structure and conventions for labeling that fit our structured-statement on-line manipulation aids. 4d3a

These permit sophisticated computer aid where suitable, and also allow the programmer to switch to machine-level coding (with full access to variables, labels, etc.) where core space, speed, timing, core-mapping arrangements, etc., are critical. 4d3a1

The NLS is organized as follows (letters refer to Figure 9): 4d4

The Control Processor (E) receives and processes successive user actions and calls upon subroutines in the library (H) to provide it such services as the following: 4d4a

Putting display feedback on the screen 4d4a1

Locating certain data in the file 4d4a2

Manipulating certain working data 4d4a3

Constructing a display view of specified data according to given viewing parameters, etc. 4d4a4

The NLS library subroutines (H) are produced from MOL programs (F), as translated by the MOL Translator (G). 4d4b

The Control Processor is produced from the

control-language description (D), written in Control Metalanguage, as translated by the CMLT (C). 4d4c

The CMLT, in turn, is produced from a description (A) written in Tree Meta, as translated by the Tree Meta Translator (B). 4d4d

Advantages of Metalanguage Approach to NLS Implementation 4d5

The metalanguage approach gives us improved means for control-language specification, in terms of being unambiguous, concise, canonical, natural and easy to compose, study and modify. 4d5a

Moreover, the Control Metalanguage specification promises to provide in itself a users' documentation that is completely accurate, and also has the above desirable characteristics to facilitate study and reference. 4d5b

Modifying the control-dialogue procedures for existing functions, or making a reasonable range of changes or additions to these functions, can often be accomplished solely by additions or changes to the control-language record (in CML). 4d5c

With our on-line studying, manipulating and compiling techniques, system additions or changes at this level can be thought out and implementd (and automatically documented) very quickly. 4d5c1

New functions that require basic operations not available through existing subroutines in the NLS library will need to have new subroutines specified and programmed (in MOL), and then will need new terms in CML to permit these new functions to be called upon. This latter requires a change in the record (A), and a new compilation of CMLT by means of the Tree Meta Translator. 4d5d

On-line techniques for writing and modifying the MOL source code (F), for executing the compilations, and for debugging the routines, greatly reduce the effort involved in this process. 4d5d1

SERVICE-SYSTEM HARDWARE (OTHER THAN SDS 940) 5

In addition to the SDS 940, the facility includes peripheral

equipment made by other manufacturers and equipment designed and constructed at SRI. 5a

All of the non-SDS equipment is interfaced through the special devices channel which connects to the second memory buss through the SDS memory interface connection (MIC). 5b

This equipment, together with the RAD, is a significant load on the second memory buss. Not including the proposed "special operations" equipment, the maximum expected data rate is approximately 264,000 words per second or one out of every 2.1 memory cycles. However, with the 940 variable priority scheme for memory access (see Pirtle), we expect less than 1 percent degradation in CPU efficiency due to this load. 5b1

This channel and the controllers (with the exception of the disc controller) were designed and constructed at SRI. 5b2

In the design of the hardware serving the work stations, we have attempted to minimize the CPU burden by making the system as automatic as possible in its access to memory and by formatting the data in memory so as to minimize the executive time necessary to process it for the users. 5b2a

Figure 10 is a block diagram of the special-devices channel and associated equipment. The major components are as follows: 5c

Executive Control 5c1

This is essentially a sophisticated multiplexer that allows independent, asynchronous access to core from any of the 6 controllers connected to it. Its functions are the following: 5c1a

Decoding instructions from the computer and passing them along as signals to the controllers. 5c1a1

Accepting addresses and requests for memory access (input or output) from the controllers, determining relative priority among the controllers, synchronizing to the computer clock, and passing the requests along to memory via the MIC. 5c1a2

The executive control includes a comprehensive debugging panel that allows any of the 6 controllers to be

operated off-line without interfering with the operation of other controllers. 5c1b

Disc File 5c2

This is a Model 4061 Bryant disc, selected for compatibility with the continued 940-system development by Berkeley's Project GENIE, where extensive file-handling software was developed. 5c2a

As formatted for our use, the disc will have a storage capacity of approximately 32 million words, with a data-transfer rate of roughly 40,000 words per second and average access time of 85 milliseconds. 5c2b

The disc controller was designed by Bryant in close cooperation with SRI and Project GENIE. 5c2c

Display System 5c3

The display systems consists of two identical subsystems, each with display controller, display generator, 6 CRT's and 6 closed-circuit television systems. 5c3a

The display controllers process display-command tables and display lists that are resident in core, and pass along display-buffer contents to the display generators. 5c3b

The display generators and CRT's were developed by Tasker Industries to our specifications. Each has general character-vector plotting capability. They will accept display buffers consisting of instructions (beam motion, character writing, etc.) from the controller. Each will drive six 5-inch high-resolution CRT's on which the display pictures are produced. 5c3c

Character writing time is approximately 8 microseconds, allowing an average of 1000 characters on each of the six monitors when regenerating at 20 cps. 5c3c1

A high-resolution (875-line) closed-circuit television system transmits display pictures from each CRT to a television monitor at the corresponding work-station console. 5c3d

This system was developed as a "best solution" to our

experimental-laboratory needs, but it turned out to have properties which seem valuable for more widespread use: 5c3e

Since only all-black or all-white signal levels are being treated, the scan-beam current on the cameras can be reduced to achieve a short-term image-storage effect that yields flicker-free TV output even when the display refresh rate is as low as 15 cps. This allows a display generator to sustain about four times more displayed material than if the users were viewing direct-view refreshed tubes. 5c3e1

The total cost of small CRT, TV camera, amplifier-controller, and monitor came to about $5500 per work station--where a random-deflection, display-quality CRT of similar size would cost considerably more and would be harder to drive remotely. 5c3e2

Another cost feature which is very important in some system environments favors this TV approach: the expensive part is centrally located; each outlying monitor costs only about $600, so terminals can be set up even where usage will be low, with some video switching in the central establishment to take one terminal down and put another up. 5c3e3

An interesting feature of the video system is that with the flick of a switch the video signal can be inverted, so that the image picked up as bright lines on dim background may be viewed as black lines on a light background. There is a definite user preference for this inverted form of display. 5c3e4

In addition to the advantages noted above, the television display also invites the use of such commercially available devices as extra cameras, scan converters, video switches, and video mixers to enrich system service. 5c3f

For example, the video image of a user's computer-generated display could be mixed with the image from a camera focused on a collaboratory at another terminal; the two users could communicate through both the computer and a voice intercom. Each user would then see the other's face superimposed on the display of data under discussion. 5c3f1

Superimposed views from cameras focused on film images or drawers, or on the computer hardware, might also be useful. 5c3f2

We have experimented with these techniques (see Figure 11) and found them to be very effective. They promise to add a great deal to the value of remote display terminals. 5c3f3

Input-Device Controller 5c4

In addition to the television monitor, each work-station console has a keyboard, binary keyset, and mouse. 5c4a

The controller reads the state of these devices at a preset interval (about 30 milliseconds) and writes it into a fixed location table in core. 5c4b

Bits are added to information from the keyboards, keysets and mouse switches to indicate when a new character has been received or a switch has changed state since the last sample. If there is a new character or switch change, an interrupt is issued after the sample period. 5c4b1

The mouse coordinates are formatted as a beam-positioning instruction to the display generator. Provisions are made in the display controller for including an entry in the mouse-position table as a display buffer. This allows the mouse position to be continuously displayed without any attention from the CPU. 5c4b2

Special Operations 5c5

The box with this label in Figure 10 is at this time only a provision in the executive control for the addition of a high-speed device. We have tentative plans for adding special hardware here to provide operations not available in the 940 instruction set, such as character-string moves and string-pattern matching. 5c5a

Low-Priority Devices 5c6

This controller accommodates three devices with relatively low data-transfer rates. At this time only the line printer is implemented, with provisions for

adding an on-line typewriter (Dura), a plotter, and a terminal for the proposed ARPA computer network. 5c6a

The line printer is a Plotter Model HSP-3502 chain printer with 96 printing characters and a speed of about 230 lines per minute. 5c6a1

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Final Report Contract NAS 1-3988 SRI Project 5061 Stanford Research Institute Menlo Park California July 1965 6a

(English2) W. K. ENGLISH; D. C. ENGELBART; M. L. BERMAN
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Summary Report Contract AF 49 638 1024 SRI Project 3578
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(Hay1) R E HAY; J F RULIFSON
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Interim Technical Report Contract NAS 1-5940 SRI Project 5890
Stanford Research Institute Menlo Park California March 1968 6e

(Pirtle1) M. PIRTLE
Intercommunication of Processors and memory
Proc Fall Joint Computer Conference Anaheim California November 1967. 6f

A RESEARCH CENTER FOR AUGMENTING HUMAN INTELLECT

(J12580) 6-NOV-72 9:54; Title: Author(s): Stanford Research Institute/&SRI-ARC ; Sub-Collections: SRI-ARC; Clerk: MFA;
Origin: <AUERBACH>XDOC3954.NLS;1, 17-OCT-72 11:29 LLL ;

SJL 6-NOV-72 19:36 12581

Message

Hello Clark 1

Since I noticed your name is on nls I thought I would send you a message 2

and see how it works. I am currently trying to convince PRC to send me to the 3

FJCC so if I make I will see you there. 4

Take care, 5

Sheldon Laube 6

SJL 6-NOV-72 19:36 12581

Message

(J12581) 6-NOV-72 19:36; Title: Author(s): Laube, Sheldon J./SJL; Distribution: Weissman, Clark/CW; Sub-Collections: NIC; Clerk: SJL;

VGC 6-NOV-72 14:24 12582

Respnse to Nancy Neigus

Nancy, a partial list includes MIT-AI, Mathlab, DMCG, NMC, CCN(91), SAIL, BBN(???). 1

VGC 6-NOV-72 14:24 12582

Respnse to Nancy Neigus

(J12582) 6-NOV-72 14:24; Title: Author(s): Cerf, Dr. Vinton G./VGC; Distribution: Neigus, Nancy J./njn ; Sub-Collections: NIC; Clerk: VGC;

VGC 6-NOV-72 14:34 12583

Map request from Vint cerf

Alex: I would like a map. Please send it tome at:
Stanford E;ectronics Lab
Stanford University
Stanford, California 94305

Where do I send the $2?? thanks, vint 1

VGC 6-NOV-72 14:34 12583

Map request from Vint cerf

(J12583) 6-NOV-72 14:34; Title: Author(s): Cerf, Dr. Vinton G./VGC;
Distribution: McKenzie, Alex A./aam ; Sub-Collections: NIC; Clerk: VGC;

JLM 7-NOV-72 7:40 12584

doc/dist

31 oct. 1

f allen called to let me know that air staff was sending down a letter saying that we should be encouraged to work on ahi and help f allen define a program . 1a

i said that was great and that we could use the letter in our pitches for money in this area. I brought up our discussion with doug about the fact that arc had developed a extensive capability in document prearation and distribution which could be available for experimentaion by some org like admin. 1a1

he reacted with interst and said they were doing some of computer aided doc prep now .i suggested that we get together some time with sri and explore possible applications . 1a2

i think it would be worth the effort the next time that doug or one of his guys were in the area to arrange a chat with him. 2

i also think it would be worth a call or something to get up to date on what aflc is doing with the lpg etc. they might be a ideal customer. 3

JLM 7-NOV-72 7:40 12584

doc/dist

(J12584) 7-NOV-72 7:40; Title: Author(s): McNamara, John L./JLM;
Distribution: Stone, Duane L., Engelbart, Douglas C./DLS DCE;
Sub-Collections: RADC; Clerk: JLM;
Origin: <MCNAMARA>DOC/DIST.;1, 7-NOV-72 5:21 JLM ;

DVN 13-NOV-72 10:29 12585

Thanks to SRI Washington and Irving Harris

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

SCharlotte Sakellaris
Manager, Administrative Services
RI-WASH

Dear Ms. Sakellaris:

We would like to thank SRI Washington and in particular Mr. Irving Harris for the way they picked up all the debris from our demonstrations at the ICCC at the Washington Hilton last week. 1

Mr. Harris was promptly on the spot though little dismayed by the volume and disarray of stuff with which we confronted him. He promptly set about taking it off our hands to our immense relief. It has arrived safely. 2

Yours sincerely,

Dirk vanNouhuys
Research Analyst
Augmentation Research Center

ber

DVN 13-NOV-72 10:29 12585

Thanks to SRI Washington and Irving Harris

(J12585) 13-NOV-72 10:29; Title: Author(s): Van Nouhuys, Dirk H./DVN; Sub-Collections: SRI-ARC; Clerk: BER;
Origin: <ROW>THANKS.NLS;2, 7-NOV-72 9:08 BER ;

.HJournal="DVN 14 NOV 72 4:38AM 12585";

JCN 10 NOV 72 5:52AM 12586";

JCN 7-NOV-72 17:54 12586
Operations Administration Plan Update Request

The most recent pass at developing plans for this Operations activity was documented in (10901,) in July 1972. 1

Now that ICCC is over, we should re-examine our plans and reshape them to meet current needs. The EMC is now gathering some specifics about what tasks are now ongoing and what we think should be the next set. 1a

Each pusher for our Operational components should also make his plans and needs known so that they can be integrated into the overall ARC set of plans. 1a1

Please extend and/or update the plans for your area outlined below. These are extracted from the July set, with minor changes made recently by JCN. 1b

I would like to receive a completed plan from each Operations activity by Friday, November 17, regardless of the state at that time. OK? 1c

Administration: Pusher: DVN 2

1. Objectives 2a

To keep functions within its scope running smoothly; 2a1

To keep many problems off minds of others in ARC; 2a2

To foresee and resolve problems as quickly and effectively as possible within resources and priority. 2a3

2. Areas of Responsibility (task areas) 2b

Tasks: 2b1

Space 2b1a

Acquire, Assign, Arrange. 2b1a1

Controller Functions: 2b1b

ARC Budget preparation, analysis. 2b1b1

Project cost analysis, summary preparation. 2b1b2

ARC backlog report. 2b1b3

Time sheet submitting, approvals, analysis (percent of time sold).	2b1b4
Prepare Cost sections of Proposals.	2b1b5
Telephones	2b1c
Acquire, Assign, Arrange.	2b1c1
Capital equipment	2b1d
Help select, Order.	2b1d1
Visitor coordination	2b1e
Direct visitors to proper people; schedule; protect people from useless visitors; watch over vistor log.	2b1e1
Contract Coordination	2b1f
Request contract officer approvals, help negotiate.	2b1f1
Report coordination:	2b1g
-- annual, final, quarterly management reports;schedule and assign writing, editing, printing.	2b1g1
Proposal coordination,	2b1h
schedule and assign writing, editing, printing	2b1h1
follow up in contract negotiation.	2b1h2
SRI Department Interface Help ARC people when they have to deal with:	2b1i
ISE office	2b1i1
Purchasing	2b1i2
-- approve, order, coordinate	2b1i2a
Contracts	2b1i3
Accounting	2b1i4
Library	2b1i5

Capital equipment		2b3b2
Common --		2b3c
Plans for improvement		2b3c1
Contract Coordination (mostly JCN)		2b3c2
Visitor coordination		2b3c3
Personnel matters,		2b3c4
SRI Department Interface (mostly DvN)		2b3c5
		2b3d
Estimated DVN Time: Split next few months:		2b4
	%	2b4a
Administration	30	2b4b
RADC	20	2b4c
DPCS	10	2b4d
User Interface (training +)	20	2b4e
Overhead	20	2b4f

3. New or changed features needed 2c

4. Methodology, procedures needed: 2d

5. Stages of development: 2e

6. Relationships to other tasks and activities: 2f

7. Effort needed to meet stages: 2g

JCN 7-NOV-72 17:54 12586

Operations Administration Plan Update Request

(J12586) 7-NOV-72 17:54; Title: Author(s): Norton, James C./JCN ;
Distribution: Engelbart, Douglas C., Irby, Charles H., Watson, Richard
W., Norton, James C., Van Nouhuys, Dirk H./EMC DVN ; Sub-Collections:
SRI-ARC EMC; Clerk: JCN ;
Origin: <NORTON>ADMIN.NLS;1, 7-NOV-72 16:22 JCN ; HJOURNAL="

JCN 7-NOV-72 17:58 12587
Operations CSO: Hardware Plan Update Request

HJOURNAL=" JCN 10 NOV 72 5:53AM 12587";

Operations CSO: Hardware Plan Update Request

The most recent pass at developing plans for this Operations activity was documented in (10901,) in July 1972. 1

Now that ICCC is over, we should re-examine our plans and reshape them to meet current needs. The EMC is now gathering some specifics about what tasks are now ongoing and what we think should be the next set. 1a

Each pusher for our Operational components should also make his plans and needs known so that they can be integrated into the overall ARC set of plans. 1a1

Please extend and/or update the plans for your area outlined below. These are extracted from the July set, with minor changes made recently by JCN. 1b

I would like to receive a completed plan from each Operations activity by Friday, November 17, regardless of the state at that time. OK? 1c

CSO: Hardware: Pusher: MEH 2

1. Objectives 2a

Provide appropriate equipment, in sufficient amount, keep running smoothly 2a1

2. Areas of Responsibility (task areas) 2b

Acquire equipment, including acceptance tests/quality assurance processes 2b1

Coordinate with projects, new development coordinator, delivery, user needs 2b1a

Maintain equipment - regularly 2b2

Trouble shoot - responsively 2b3

Document hardware and maintain it 2b4

Develop and document procedures for above 2b5

Maintain trouble logs 2b6

Get and train right people, keep developing them 2b7

Have analyses made of the needs of users and service levels to see how they are being met. 2b8

3. New or changed features needed 2c

4. Methodology, procedures needed: 2d

5. Stages of development: 2e

See EKV's Hardware Reccommendations (11943,:xbnh) 2e1

6. Relationships to other tasks and activities: 2f

7. Effort needed to meet stages: 2g

JCN 7-NOV-72 17:58 12587
Operations CSO: Hardware Plan Update Request

(J12587) 7-NOV-72 17:58; Title: Author(s): Norton, James C./JCN ;
Distribution: Engelbart, Douglas C., Irby, Charles H., Watson, Richard W., Norton, James C., Hardy, Martin E./EMC MEH ; Sub-Collections: SRI-ARC EMC; Clerk: JCN ;
Origin: <NORTON>CSOHARDWARE.NLS;2, 7-NOV-72 17:22 JCN ;

JCN 7-NOV-72 18:04 12588
Operations CSO: Software Plan Update Request

HJOURNAL=" JCN 10 NOV 72 5:53AM 12588";

JCN 7-NOV-72 18:04 12588
Operations CSO: Software Plan Update Request

The most recent pass at developing plans for this Operations activity was documented in (10901,) in July 1972. 1

Now that ICCC is over, we should re-examine our plans and reshape them to meet current needs. The EMC is now gathering some specifics about what tasks are now ongoing and what we think should be the next set. 1a

Each pusher for our Operational components should also make his plans and needs known so that they can be integrated into the overall ARC set of plans. 1a1

Please extend and/or update the plans for your area outlined below. These are extracted from the July set, with minor changes made recently by JCN. 1b

I would like to receive a completed plan from each Operations activity by Friday, November 17, regardless of the state at that time. OK? 1c

CSO: Software: Pusher: DCW and HGL? 2

1. Objectives 2a

Deliver new system features to users, keep running smoothly 2a1

2. Areas of Responsibility (task areas) 2b

TENEX: DCW 2b1

Accept new system features, including acceptance tests/quality assurance processes 2b1a

Coordinate with projects, new development, delivery, user needs 2b1a1

Trouble shoot - responsively 2b1b

Maintain documentation 2b1c

Maintain trouble logs 2b1d

Get and train right people, keep developing them 2b1e

Have analyses made of the needs of users and service levels to see how they are being met. 2b1f

NLS: HGL? 2b2

Accept new system features, including acceptance tests/quality assurance processes 2b2a

Coordinate with projects, new development, delivery, user needs 2b2a1

Trouble shoot - responsively 2b2b

Maintain documentation 2b2c

Maintain trouble logs 2b2d

Get and train right people, keep developing them 2b2e

Have analyses made of the needs of users and service levels to see how they are being met. 2b2f

3. New or changed features needed 2c

4. Methodology, procedures needed: 2d

5. Stages of development: 2e

6. Relationships to other tasks and activities: 2f

7. Effort needed to meet stages: 2g

JCN 7-NOV-72 18:04 12588
Operations CSO: Software Plan Update Request

(J12588) 7-NOV-72 18:04; Title: Author(s): Norton, James C./JCN ;
Distribution: Engelbart, Douglas C., Irby, Charles H., Watson, Richard
W., Norton, James C., Wallace, Donald C. (Smokey), Lehtman, Harvey
G./EMC DCW HGL ; Sub-Collections: SRI-ARC EMC; Clerk: JCN ;
Origin: <NORTON>CSOSOFTWARE.NLS;1, 7-NOV-72 17:24 JCN ;

JCN 10 NOV 72 5:54AM 12589";

The most recent pass at developing plans for this Operations activity was documented in (10901,) in July 1972. 1

Now that ICCC is over, we should re-examine our plans and reshape them to meet current needs. The EMC is now gathering some specifics about what tasks are now ongoing and what we think should be the next set. 1a

Each pusher for our Operational components should also make his plans and needs known so that they can be integrated into the overall ARC set of plans. 1a1

Please extend and/or update the plans for your area outlined below. These are extracted from the July set, with minor changes made recently by JCN. 1b

I would like to receive a completed plan from each Operations activity by Friday, November 17, regardless of the state at that time. OK? 1c

Operator: Pusher: WRF 2

See also: ARC Operators' Manual (11149,1:xbznC) 2a

1. Objectives 2b

The main objective of the operators roles' is to insure that the computer facilities designed for both local and NET usage are available as scheduled. This objective is accomplished by continual monitoring of the state of the system, and performance of a number of daily duties, which are briefly outlined below. 2b1

2. Areas of Responsibility (task areas) 2c

a. Maint. of local system 2c1

Act as first shot trouble shooter for various system failures, attempting to coordinate activies of software and hardware personnel 2c1a

Collect statistics and format the UP-DOWN Chart 2c1b

c. Set DBUGSW at its appropriate setting (1 or 2 during day, and 0 during off-hours) 2c1c

b. Maint. of NET 2c2

Periodically check status of NETSER, esp. 5 am - 6 pm (and take appropriate corrective measures when it fails) 2c2a

Coordinate hardware efforts concerning IMP (i.e. maintain contact with BBN) 2c2b

c. Ride shotgun over file system 2c3

Retrieve files from dump and <ARCHIVE> tapes. 2c3a

Archive files for users 2c3b

Move files from one directory to another 2c3c

Copy various files to DEC tape for shipment to other software groups 2c3d

Insure that there is sufficient disk space (and run DELD if there is not) 2c3e

Make first shot repairs and adjustments (like disk alloc. and passwords) to directory system 2c3f

4. Journal System Maint. 2c4

Insure that the Journal is available for submission from 5am until 6pm (by trying to submit a message), and notify apropriate personnel if BACKGROUND is in SNKERR, or submission test fails. 2c4a

Run Journal Hardcopy Formatting job daily (and coordinate appropriate personnel if this fails) 2c4b

Coordinate printing of Journal Hardcopy 2c4c

Help JDH fix Journal when it is not available 2c4d

e. Insure that a system dump is made after every workday 2c5

Maintain sufficient number of blank tapes 2c5a

Coordinate on-call personnel 2c5b

f. Maintain various documents of System 2c6

Update Monitor Listings whenever necessary (about once every week to ten days, whenever a new Monitor is brought up) 2c6a

Maintain Dump Listings 2c6b

Update Opeators' Manual whenever necessary (same time as Monitor Listings) 2c6c

g. Provide user help and aid with various problems 2c7

More definition will be forthcoming 2c7a

3. New or changed features needed 2d

4. Methodology, procedures needed: 2e

5. Stages of development: 2f

6. Relationships to other tasks and activities: 2g

7. Effort needed to meet stages: 2h

JCN 7-NOV-72 18:08 12589

Operations CSO: Operator Plan Update Request

(J12589) 7-NOV-72 18:08; Title: Author(s): Norton, James C./JCN ;
Distribution: Engelbart, Douglas C., Irby, Charles H., Watson, Richard W., Norton, James C., Ferguson, Ferg R./EMC WRF ; Sub-Collections: SRI-ARC EMC; Clerk: JCN ;
Origin: <NORTON>OPERATOR.NLS;2, 7-NOV-72 17:40 JCN ; HJOURNAL="

10 NOV 72 5:55AM 12590";

Operations PSO Plan Update Request

The most recent pass at developing plans for this Operations activity was documented in (10901,) in July 1972. 1

Now that ICCC is over, we should re-examine our plans and reshape them to meet current needs. The EMC is now gathering some specifics about what tasks are now ongoing and what we think should be the next set. 1a

Each pusher for our Operational components should also make his plans and needs known so that they can be integrated into the overall ARC set of plans. 1a1

Please extend and/or update the plans for your area outlined below. These are extracted from the July set, with minor changes made recently by JCN. 1b

I would like to receive a completed plan from each Operations activity by Friday, November 17, regardless of the state at that time. OK? 1c

PSO: Pusher: DVN 2

Background: Launching the PSO 2a

Functions (from activities such as RINS, NIC, Baseline Record, and Journal) and use of Deferred EXecution (DEX) techniques have created several new types of needs for people services support. 2a1

As a result, we are reorganizing these activities to allow more effective and efficient handling of routine and other tasks and to allow for easier expansion of the group size to meet needs for an increasing amount of throughput. The three aims are: 2a2

Getting the throughput up to meet demands. 2a2a

Getting in position to be rapidly expandable (in throughput quantity) to meet fluctuating service demands. 2a2b

Working at minimizing costs while maximizing responsiveness to customers' needs/values. 2a2c

Last Fall, we launched a new approach to ARC's "people services operations". (see -- 7834,1a)
The main thrusts were: 2a3

Organization 2a4

A group with skills in handling paperwork and messages, in using TNLS and DEX, was explicitly identified as PSO, and a group of advisors (PSST) with skills in administration, documentation, and training was assigned to assist in getting PSO into formal operation. 2a4a

PSST has been retired, with the day-to-day operation of the PSO being handled by several people in key roles. CXP is the work scheduler; DVN is temporarily acting as the PSO pusher. 2a4b

Physical Location and Configuration 2a5

Office and workroom areas were expanded and relocated, to give the growing support operations more efficient location and arrangement. New tables, shelves, cabinets, and files were acquired and their configurations worked out. 2a5a

Procedure Establishment and Documentation 2a6

Manuals and procedures were written for use of TNLS (see -- 7470,) and DEX (see -- 9934,). 2a6a

Procedures were established and written for handling of transcription and other service requests. 2a6b

Procedures for all related ARC activities, clerical and secretarial, were established and documented. 2a6c

Transcription Activities 2a7

Types of work to be handled: 2a7a
- Handwritten drafts 2a7a1
- Tape recordings 2a7a2
- Dictation notes 2a7a3
- Off-line documents 2a7a4
- On-line documents to be edited 2a7a5

Techniques for transcribing material into on-line files have been developed: 2a7b

Deferred Execution (DEX) 2a7b1

This process makes use of terminal and magnetic tape recording equipment for initial input of data

with actual entry into computer files deferred until periods of relatively low system use (thereby resulting in less expensive use of the system for the processing of this work). 2a7b1a

DEX is preferred for most work. Pieces of work can be spooled by priority. 2a7b1b

Where and how long to store entered tapes for backup, the conventions for hierarchical statement entry treatment, and when the transcriber should try to put hierarchical structure into documents are still under development. 2a7b1c

TNLS 2a7b2

In some cases TNLS is used, particularly for high-priority items during off-peak load hours. 2a7b2a

DNLS 2a7b3

Display NLS is used for otherwise difficult final formatting and other appropriate tasks. 2a7b3a

Receiving process 2a7c

We have set up a central receiving station. 2a7c1

There is one person with an alternate who can handle users' questions regarding job status, time and cost estimates, etc. 2a7c2

Priority determination process 2a7d

A requester specifies his preference for priority: 2a7d1

Immediate service (1-4 hours) 2a7d1a
Normal service (4-12 hours) 2a7d1b
Deferred service (a week or two) 2a7d1c

Temporary storage of unassigned work 2a7e

A log system using appropriate work request forms has been set up. 2a7e1

We have a central storage place, organized for control of work by priority. 2a7e2

Assignment process for transcription work 2a7f

A work scheduler assigns incoming work to group members, balancing priority request with members' capabilities and workload. 2a7f1

Later, priorities may be established by a bidding scheme. 2a7f2

It is contemplated to enlarge this effort to allow assignment to an outside pool of workers trained in DEX, both SRI people and contract manpower. 2a7f3

Output processes 2a7g

We have developed conventions for naming of temporary input files (special and separate for the catalog process) with provision for special instructions from the author. 2a7g1

We have developed procedures for delivery of completed work to the requester. 2a7g2

Terminals 2a8

We have made a thorough study of available teletype terminals and magnetic tape devices, and after experimenal use of several, have leased nine TI terminals and six Termicettes, for use with DEX. 2a8a

We need to keep watch on the number and type of terminals required and secure more when necessary. 2a8b

This will be done in a coordinated manner with Delivery. 2a8b1

Personnel 2a9

We have added several new staff members who have replaced people leaving ARC. We have also added several temporary people and trained them in ARC and NIC tasks. 2a9a

Training 2a10

Classes in TNLS and DEX were held for ARC and network PSO people. 2a10a

1. Objectives 2b

Provide needed service, keep running smoothly to meet demand within balance of needs/funds constraints 2b1

2. Areas of Responsibility (task areas) 2c

Responsibilities 2c1

Develop and maintain procedures - keep users informed 2c1a

Provide services offered to meet loads --see (7834,) 2c1b

PROCESSES: 2c1b1

Transcription 2c1b1a

Reproduction 2c1b1b

Distribution 2c1b1c

Journal entry 2c1b1d

Baseline routines 2c1b1e

Identification file maintenance 2c1b1f

Catalog maintenance, and production 2c1b1g

Routine office tasks 2c1b1h

NIC station activity 2c1b1i

Functional document production 2c1b1j

Analyze needs, interact with projects, Develoment Coordinator, delivery 2c1c

Get and train the right people and keep developing them 2c1d

Balance services offered and provided with user needs and funds available to run the service smoothly 2c1e

A list of the types of tasks the PSO group and associated information handling people perform (or plan to perform) to support ARC is given below: 2c2

Acquisition of publications 2c2a

Checking holdings 2c2a1

Collating	2c2f3
Stamping, Punching	2c2f4
Xeroxing of documents	2c2f5
Line printer output	2c2f6
Outside repro contact	2c2f7
Planning and scheduling	2c2g
Goal setting	2c2g1
Procedure establishment	2c2g2
Discussion	2c2g2a
Procedure writing	2c2g2b
Experimentation	2c2g2c
Work flow scheduling	2c2g3
PSO time and cost studies	2c2g4
Reference work	2c2h
Locating citations for ARC	2c2h1
Locating documents for ARC	2c2h2
Literature search	2c2h3
Storage and maintenance	2c2i
ARC Journal Master-access copies	2c2i1
Engelbart copies	2c2i2
Supplies	2c2i3
Training	2c2j
Instruction	2c2j1
Development of training aids	2c2j2
Visual aids	2c2k
Chartmaking	2c2k1

3. New or changed features needed 2d

4. Methodology, procedures needed: 2e

5. Stages of development: 2f

6. Relationships to other tasks and activities: 2g

7. Effort needed to meet stages: 2h

JCN 7-NOV-72 18:12 12590

Operations PSO Plan Update Request

(J12590) 7-NOV-72 18:12; Title: Author(s): Norton, James C./JCN ;
Distribution: Engelbart, Douglas C., Irby, Charles H., Watson, Richard
W., Norton, James C., Van Nouhuys, Dirk H./EMC DVN ; Sub-Collections:
SRI-ARC EMC; Clerk: JCN ;
Origin: <NORTON>PSO.NLS;1, 7-NOV-72 17:41 JCN ; HJOURNAL=" JCN

JCN 7-NOV-72 18:18 12591
Operations User Interface Plan Update Request

HJOURNAL=" JCN 10 NOV 72 5:57AM 12591";

JCN 7-NOV-72 18:18 12591
Operations User Interface Plan Update Request

The most recent pass at developing plans for this Operations activity was documented in (10901,) in July 1972. 1

Now that ICCC is over, we should re-examine our plans and reshape them to meet current needs. The EMC is now gathering some specifics about what tasks are now ongoing and what we think should be the next set. 1a

Each pusher for our Operational components should also make his plans and needs known so that they can be integrated into the overall ARC set of plans. 1a1

Please extend and/or update the plans for your area outlined below. These are extracted from the July set, with minor changes made recently by JCN. 1b

I would like to receive a completed plan from each Operations activity by Friday, November 17, regardless of the state at that time. OK? 1c

User Interface: Pusher: MFA 2

See also: Preliminary charter for Operations User Interface (10189,1:wznC) 2a

1. Objectives 2b

- Provide information needed by ARC and Network users as to ARC system facilities and user features 2b1

- Provide interactive communication with users regarding user information needs and problems 2b2

- provide feedback culled from user group as to user needs to ARC - other ARC functions 2b3

2. Areas of Responsibility (task areas) 2c

Responsibilities: 2c1

- originate, provide, maintain, and dissiminate ARC user system documentation and hold training sessions as necessary 2c1a

- Analyze user needs for the purpose of recommending system modifications, new features, etc. 2c1b

- Maintain active communications channels with users 2c1c

- Orient new ARC personnel in conjunction with Operations Administration and appropriate groups at ARC 2c1d

- Monitor as user representative ongoing system development with eye on user needs 2c1e

- Provide some sort of newsletter providing users with information on current system status at regular intervals 2c1f

First responsibility is to provide user community with a common set of documentation to enable reasonable system usage 2c2

encourage users to utilize the above to attain some degree of sophistication with increasing effectiveness 2c3

Scope 2c4

- At present, limited to user interface for ARC and Network and coordinated with other functions which interact with users - e.g. NIC, Station Agent, Liaison, and the Operations CSO operator. 2c4a

Immediate tasks 2c5

- Hardcopy and journal documentation of recent user features from the file <NLS>Status for ARC users 2c5a

- Hardcopy and Journal documentation of newly updated <DOCUMENTATION>FOLKLORE file for Network users 2c5b

DONE?- Documentation and training session for PSO personnel covering simple content analysis, sorts and merges, and the basics of running user programs 2c5c

DONE?- Quick and dirty DNLS documentation based on old TODAS Manual and whatever can be culled from the Folklore branch of <NLS>STATUS, the Handbook, heresay, etc. 2c5d

- Update the Dialog Support System User Guide and republish 2c5e

- Prepare draft for DEX-2 User Guide 2c5f

Ongoing tasks 2c6

- user interaction 2c6a

- Handbook maintenance 2c6b

- successive publishing and journalizing of new system features via the file <NLS>STATUS 2c6c

Longer range tasks 2c7

- produce TNLS/DNLS Super Reference Document 2c7a

DONE?- produce TNLS/DNLS summary (20 pages) 2c7b

DONE?- produce NLS Primer (80 pages or so) 2c7c

Notes: 2c8

- The current TNLS documentation will not be updated as such but will be republished as part of the super TNLS/DNLS Reference Manual which will be pursuant to the new NLS language changes which should be implemented by the Spring of '73. 2c8a

- New features, changes in NLS will be communicated to users via the file <NLS>STATUS. 2c8b

- Some effort will be directed toward the development of user profiles as a means for guiding this phase of Operations at ARC 2c8c

- The following procedural and task related documents are forthcoming: 2c8d

  * guide for the orientation of new ARC personnel 2c8d1

  * summary of documentation tasks required by NIC 2c8d2

  * maintenance procedures for <NLS>STATUS, <DOCUMENTATION>FOLKLORE, and all published user documentation 2c8d3

3. New or changed features needed 2d

4. Methodology, procedures needed: 2e

5. Stages of development: 2f

6. Relationships to other tasks and activities: 2g

7. Effort needed to meet stages: 2h

JCN 7-NOV-72 18:18 12591
Operations User Interface Plan Update Request

(J12591) 7-NOV-72 18:18; Title: Author(s): Norton, James C./JCN ;
Distribution: Engelbart, Douglas C., Irby, Charles H., Watson, Richard W., Norton, James C., Auerbach, Marilyn F./EMC MFA ; Sub-Collections: SRI-ARC EMC; Clerk: JCN ;
Origin: <NORTON>USERINTERFACE.NLS;1, 7-NOV-72 17:46 JCN ;

JCN 7-NOV-72 17:50 12592
ARC Operations: Goals, Responsibilities and Current Plan Requests

HJOURNAL=" JCN 10 NOV 72 5:58AM 12592";

ARC Operations: Goals, Responsibilities and Current Plan Requests

ABOUT ARC OPERATIONS 1

ARC Operations is an ARC Line Activity (LINAC) which together with the Personal and Organizational Development and Framework Activities (PODAC and FRAMAC) is a key component activity of the Augmentation Research Center. 1a

The main objective of Operations is to provide the necessary support for effective development and use of the ARC augmentation system so as to permit as significant progress in its development and exportation as is consistent with other ARC goals. 1b

This includes meeting commitments to SRI and to ARC clients (through support of projects such as IPT, NIC, ONR, and RADC), improving the ARC working modes and environment, and maintaining a financially sound business operation. 1b1

To these ends, almost everything in our Center's operation is of concern to Operations. The distinction between Operations and the other ARC activities, Developmental thrusts and projects lies in the placement of the prime responsibility for meeting our various sub-goals. 1b2

Where Operations has interests that will be affected by decisions or efforts of other activities, thrusts, or projects (and vice-versa), the team aspect of our management structure will come into play. For instance, where training and other personnel development needs arise, both the concerned Developmental thrust and PODAC will be involved with Operations in our approach to various problems and decisions. 1b3

Operations fits into the LINAC structure (with SRI project sub-numbers) as follows: 1c

Project 1868 ARPA/RADC: 1c1
- OPERATIONS 1c1a
  - 101 Administration 1c1a1
  - 102 CSO - Hardware 1c1a2
  - 103 CSO - Software 1c1a3
  - 104 CSO - Operators 1c1a4
  - 105 PSO - General 1c1a5
  - 106 User Interface 1c1a6
- DEVELOPMENT 1c1b
  - 201 Development Coordination 1c1b1
  - 202 Delivery 1c1b2

203 DSS - Dialog Support System	1c1b3
204 DPCS - Documentation Production and Support SYstem	1c1b4
205 BRS - Baseline Record System	1c1b5
206 SDHS - System Developers Handbook System	1c1b6
207 SEAS - Software Engineering Augmentation System	1c1b7
208 Basic NLS development	1c1b8
209 Other development	1c1b9
ANALYSIS	1c1c
311 Analysis activity	1c1c1
IPT	1c1d
401 Administration	1c1d1
NIC	1c1e
601 Administration	1c1e1
603 CSO	1c1e2
605 PSO	1c1e3
606 Net interface (includes station agent, Liaison and Net participation)	1c1e4 1c1e4a
607 NIC Development	1c1e5
XEROX	1c1f
701 Administration	1c1f1
702 MPS development	1c1f2
Project 8622 ONR:	1c2
SDIS (RINS)	1c2a
801 Administration	1c2a1
808 SDIS - System Developers Intelligence System	1c2a2
Project 1894 RADC:	1c3
RADC	1c3a
901 Administration	1c3a1
905 Baseline Management System Development Support	1c3a2

The main components of ARC Operations are: 1d

Administration: Pusher - Dirk van Nouhuys (DVN)	1d1
Computer Service Operations - Hardware: Pusher - Martin Hardy (MEH)	1d2
Computer Service Operations - Software: Pusher - Smokey Wallace and Harvey Lehtman (DCW and HGL?)	1d3
Operator: Pusher - Bill Ferguson (WRF)	1d4
People Service Operations: Dirk van Nouhuys (DVN)	1d5
User Interface: Pusher - Marilyn Auerbach (MFA)	1d6

These activities are involved in an integrated way with the provision of the various augmentation sub-system service to our users. For instance, Dialog Support System service is provided using both the CSO and the PSO in an integrated way. 1e

CURRENT REQUESTS FOR PLANS 2

The most recent pass at developing plans for our Operations activities was documented in (10901,) in July 1972. 2a

Now that ICCC is over, we are re-examining our plans and reshaping them to meet current needs. The EMC is now gathering some specifics about what tasks are now ongoing and what we think should be the next set. 2a1

Each pusher for our Operational components is also making his plans and needs known so that they can be integrated into the overall ARC set of plans. 2a1a

I have requested a completed plan from each Operations activity by Friday, November 17. 2a2

Links to plan update requests 11/7/72 are: 2a2a

Administration: Pusher: DVN
(12586,:zxbn) 2a2a1

CSO: Hardware: Pusher: MEH
(12587,:zxbn) 2a2a2

CSO: Software: Pusher: DCW and HGL?
(12588,:zxbn) 2a2a3

Operator: Pusher: WRF
(12589,:zxbn) 2a2a4

PSO: Pusher: DVN
(12590,:zxbn) 2a2a5

User Interface: Pusher: MFA
(12591,:zxbn) 2a2a6

BASIC PLAN ELEMENTS (for each Operations activity) are: 2b

1. Objectives 2b1
2. Areas of Responsibility (task areas) 2b2
3. New or changed features needed 2b3
4. Methodology, procedures needed 2b4
5. Stages of development 2b5
6. Relationships to other tasks and activities 2b6
7. Effort needed to meet stages 2b7

8. Additional notes

2b8

The plans for our ARC Operations components now under development are intended to be kept up-to-date on a continuing basis once made. They will be filed in the Baseline section of our document library. 2b9

We also plan to develop and maintain a Table of Contents (a functional document) to these plans that will be available both online and in hardcopy. 2b9a

JCN 7-NOV-72 17:50 12592

ARC Operations: Goals, Responsibilities and Current Plan Requests

(J12592) 7-NOV-72 17:50; Title: Author(s): Norton, James C./JCN ;
Distribution: Hoffman, Carol B., Lee, Susan R., Michael, Elizabeth K., Dornbush, Charles F., ARC, Guest O., Feinler, Elizabeth J. (Jake), Handbook, Augmentation Research, Kelley, Kirk E., Meyer, N. Dean, Byrd, Kay F., Prather, Ralph, White, James E. (Jim), Vallee, Jacques F., Kaye, Diane S., Rech, Paul, Kudlick, Michael D., Ferguson, Ferg R., Lane, Linda L., Auerbach, Marilyn F., Bass, Walt, Engelbart, Douglas C., Hardeman, Beauregard A., Hardy, Martin E., Hopper, J. D., Irby, Charles H., Jernigan, Mil E., Lehtman, Harvey G., North, Jeanne B., Norton, James C., Page, Cindy, Paxton, William H., Peters, Jeffrey C., Ratliff, Jake, Row, Barbara E., Riet, Ed K. Van De, Van Nouhuys, Dirk H., Victor, Kenneth E. (Ken), Wallace, Donald C. (Smokey), Watson, Richard W., Andrews, Don I., Stone, Duane L./SRI-ARC DLS ; Sub-Collections: SRI-ARC; Clerk: JCN ;
Origin: <NORTON>OPERATIONS.NLS;1, 7-NOV-72 17:31 JCN ;

EHF 7-NOV-72 10:14 12593

MESSAGE FOR JEANNIE B. NORTH: PLEASE SEND COPIES OF THE RESOURCE NOTEBOOKS TO: DR. PETER BONO, NAVSEC, CENTER BLDG, HYATTSVILLE,MD.REQUESTTHROUGH MITRE CORPORATION. 1

(J12593) 7-NOV-72 10:14; Author(s): Forman, Ernest H./EHF;
Distribution: North, Jeanne B./JBN; Sub-Collections: NIC; Clerk: ARCG;

?

1

(J12594) 7-NOV-72 6:56; Author(s): ARC, Guest O./ARCG; Distribution: North, Jeanne B./JBN; Sub-Collections: SRI-ARC; Clerk: ARCG;

ARCG 7-NOV-72 7:06 12595

RESOURCE NOTEBOOKKS

NAVSEC, CENTER BLDG. HYATTSVILLE, MD.

RESOURCE NOTEBOOKKS

ARCG 7-NOV-72 7:06 12595

RESOURCE NOTEBOOKKS

(J12595) 7-NOV-72 7:06; Title: Author(s): ARC, Guest O./ARCG;
Distribution: /; Sub-Collections: SRI-ARC; Clerk: ARCG;

JBN 7-NOV-72 7:25 12596

RESOURCE NOTEBOOKS

JBN 7-NOV-72 7:25 12596

RESOURCE NOTEBOOKS

PLEASE SEND A COPY OF THE RESOURCE NOTEBOOKS TO DR PETER BONO,NAVSEC,CENTER BLDG HYATTSVILLE, MD. THA 1

JBN 7-NOV-72 7:25 12596

RESOURCE NOTEBOOKS

(J12596) 7-NOV-72 7:25; Title: Author(s): North, Jeanne B./JBN; Distribution: North, Jeanne B./JBN; Keywords: ; Sub-Collections: SRI-ARC; Clerk: ARCG;

DVN 7-NOV-72 14:40 12597

Printing NLS Files Across the Net: Current Status

The problem with printing things out from our files on your printer via the commands used at ICCC is that people from the net are not allowed to call subsystems other than NLS. 1

A speciall arrangement was made for the ICCC but is no longer in effect. 1a

The usefulness of the arrangment at ICCC is, however, obvious to everyone and we are changing the system. Smokey (DCW) is writting the new system. He says it should be available next week. 2

When it is ready to go, we will send out instructions for it's use. 2a

Did you succeed in moveing from one user to another? 3

DVN 7-NOV-72 14:40 12597

Printing NLS Files Across the Net: Current Status

(J12597) 7-NOV-72 14:40; Title: Author(s): Van Nouhuys, Dirk H./DVN; Distribution: Crocker, David H., Lawrence, Thomas F./dhc tfl (for your information); Sub-Collections: SRI-ARC; Clerk: DVN;

JAKE 7-NOV-72 9:15 12598

Resource Notebook content and format

As you may or may not know, the Resource Notebook was issued in DRAFT form for the ICCC Meeting and we will soon be finalizing its content and format prior to dissemination of a new version to all the sites, etc. If anyone has criticisms, feedback from users at ICCC, and/or hot ideas as to what should or should not be in the Resource Notebook and how it should or should not be organized, I would like to hear from you by next week sometime. (Many PSO people have worked on the different versions of the Resource Notebook, so lets hear your views too.) 1

JAKE 7-NOV-72 9:15 12598

Resource Notebook content and format

(J12598) 7-NOV-72 9:15; Title: Author(s): Feinler, Elizabeth J. (Jake)/JAKE ; Distribution: Hoffman, Carol B., Lee, Susan R., Michael, Elizabeth K., Dornbush, Charles F., ARC, Guest O., Feinler, Elizabeth J. (Jake), Handbook, Augmentation Research, Kelley, Kirk E., Meyer, N. Dean, Byrd, Kay F., Prather, Ralph, White, James E. (Jim), Vallee, Jacques F., Kaye, Diane S., Rech, Paul, Kudlick, Michael D., Ferguson, Ferg R., Lane, Linda L., Auerbach, Marilyn F., Bass, Walt, Engelbart, Douglas C., Hardeman, Beauregard A., Hardy, Martin E., Hopper, J. D., Irby, Charles H., Jernigan, Mil E., Lehtman, Harvey G., North, Jeanne B., Norton, James C., Page, Cindy, Paxton, William H., Peters, Jeffrey C., Ratliff, Jake, Row, Barbara E., Riet, Ed K. Van De, Van Nouhuys, Dirk H., Victor, Kenneth E. (Ken), Wallace, Donald C. (Smokey), Watson, Richard W., Andrews, Don I./SRI-ARC ; Sub-Collections: NIC SRI-ARC; Clerk: JAKE ;

JAKE 7-NOV-72 9:30 12599

Viewspecs during output quickprint

At present it is not possible to issue viewspecs after giving an output directive such as Output Quickprint, etc. Instead one must define viewspecs before issuing the output command. It would save time and addressing for the user of TNLS to be able to insert viewspecs after giving an output command if this is not incompatible with TNLS programming. 1

JAKE 7-NOV-72 9:30 12599

Viewspecs during output quickprint

(J12599) 7-NOV-72 9:30; Title: Author(s): Feinler, Elizabeth J. (Jake)/JAKE ; Distribution: Irby, Charles H./CHI ; Sub-Collections: SRI-ARC; Clerk: JAKE ;

JRP 7-NOV-72 15:20 12600

i got your message. im very busy today but ill try to answer your questions tomorrow (wed) . i had fun at the archives but didnt really find anything. john. 1

JRP 7-NOV-72 15:20 12600

(J12600) 7-NOV-72 15:20; Author(s): Pickens, John R./JRP;
Distribution: Neigus, Nancy J./NJN; Sub-Collections: NIC; Clerk: JRP;

MDK 7-NOV-72 10:36 12601

Thanksgiving week activities

Marilyn ... On your request for comments re Thanksgiving week, I've scheduled an interview for Tuesday Nov 21st with David Retz that willl last five or six hours (9:00 am to about 3:00 pm) including a seminar by Mr. Retz on his recent work. That haasn't been announced yet (it's still being set up) but it definitely will come off. So I7d appreciate your not scheduling anything that would tie up ARC for that day. Thank you. MDK. 1

MDK 7-NOV-72 10:36 12601

Thanksgiving week activities

(J12601) 7-NOV-72 10:36; Title: Author(s): Kudlick, Michael D./MDK ; Distribution: Auerbach, Marilyn F., Van Nouhuys, Dirk H., Hopper, J. D./mfa dvn jdh ; Sub-Collections: SRI-ARC; Clerk: MDK;

NJN 7-NOV-72 14:13 12602

John ... I think I sent you a message yesterday on your own system. It was one of the few things I could get to work. This is to check if that message ever got to you. Basically I wanted to know what simpleminded things a simpleminded (and poorly equipped, i.e. no graphics facilities) user like myself could do to hack around on UCSB. Send answer here or to NEIGUS at BBN-TENEX. Thanks, Nancy 1

NJN 7-NOV-72 14:13 12602

(J12602) 7-NOV-72 14:13; Title: Author(s): Neigus, Nancy J./NJN;
Distribution: Pickens, John R./JRP; Sub-Collections: NIC; Clerk: NJN;

NJN 7-NOV-72 9:34 12603

Station Agents List

Jeanne....I received the RFC today that contains the current network mailing lists, and I noticed that I was not listed as the station agent for BBN-NET. 1

Also, I have not received any documentation from the station collection. At least that, I recall, was promised; although not until after the ICCC you said. 2

Am I not being considered a station agent, or was the mailing list in error? In any case we are starving for documentation here, so I would appreciate that process being started as soon as it is feasible. 3

I would also appreciate an answer to the question of my status. Thanks very much. .... Nancy Neigus 4

NJN 7-NOV-72 9:34 12603

Station Agents List

(J12603) 7-NOV-72 9:34; Title: Author(s): Neigus, Nancy J./NJN;
Distribution: North, Jeanne B./JBN; Sub-Collections: NIC; Clerk: NJN;

TFL 7-NOV-72 10:58 12604

New RADC Directories

Jim we would like to have individual directories set up for the following people who will begin training in the use of NTNLS today Monday 6 Nov 72.

William E. Rzepka 315-330-3857 or 7834
Frank S. La Monica 315-330-3857 or 7834
FROM: Tom Lawrence 1

TFL 7-NOV-72 10:58 12604

New RADC Directories

(J12604) 7-NOV-72 10:58; Title: Author(s): Lawrence, Thomas F./TFL;
Distribution: Norton, James C./JCN; Sub-Collections: RADC; Clerk: TFL;
Origin: <LAWRENCE>NEWDIR.NLS;1, 6-NOV-72 6:00 TFL ;

NJN 8-NOV-72 8:39 12605

Comment on abstract of Learning and Executing Generalized Robot Plans

A really far out paper. 1

NJN 8-NOV-72 8:39 12605

Comment on abstract of Learning and Executing Generalized Robot Plans

(J12605) 8-NOV-72 8:39; Title: Author(s): Neigus, Nancy J./NJN; Distribution: Fikes, Richard E., Coles, L. Stephen/REF LSC; Sub-Collections: NIC; Clerk: NJN;

DVN 8-NOV-72 10:32 12606

People Service Organization (PSO) Meeting, 2 November 1972 and Allocation of Transcription Work

Following (12426,) PSO met to discuss the need and means of exchanging more information. I urged brisk meetings every two weeks and brief written reports. Several people offered examples of what they might tell about their recent work at such meetings. It happened in two cases that the information offered proved immediately useful to someone else. 1

After discussion and voting we decided not to produce written reports and to meet for information exchange on the first Thursday of every month. I expect the following people to attend such meetings: 2

KFB BER SRL CBH KIRK LLL MEJ DvN 2a

The meetings are open and anyone interested is welcome. 2b

For the last few months Cindy has handed out transcription work that has been submitted with a transcription work sheet into the box in the PSO work room. Who should do the handing out now that Cindy is gone? Cindy suggested that people watch the box and pick up work as it appears. "It's no big deal" she said. We'll try to operate in this way and keep a close eye that no work gets off schedule or lost in the shuffle. 3

DVN 8-NOV-72 10:32 12606

People Service Organization (PSO) Meeting, 2 November 1972 and Allocation of Transcription Work

(J12606) 8-NOV-72 10:32; Title: Author(s): Van Nouhuys, Dirk H./DVN; Distribution: Hoffman, Carol B., Lee, Susan R., Michael, Elizabeth K., Dornbush, Charles F., ARC, Guest O., Feinler, Elizabeth J. (Jake), Handbook, Augmentation Research, Kelley, Kirk E., Meyer, N. Dean, Byrd, Kay F., Prather, Ralph, White, James E. (Jim), Vallee, Jacques F., Kaye, Diane S., Rech, Paul, Kudlick, Michael D., Ferguson, Ferg R., Lane, Linda L., Auerbach, Marilyn F., Bass, Walt, Engelbart, Douglas C., Hardeman, Beauregard A., Hardy, Martin E., Hopper, J. D., Irby, Charles H., Jernigan, Mil E., Lehtman, Harvey G., North, Jeanne B., Norton, James C., Page, Cindy, Paxton, William H., Peters, Jeffrey C., Ratliff, Jake, Row, Barbara E., Riet, Ed K. Van De, Van Nouhuys, Dirk H., Victor, Kenneth E. (Ken), Wallace, Donald C. (Smokey), Watson, Richard W., Andrews, Don I./SRI-ARC; Sub-Collections: SRI-ARC; Clerk: BER; Origin: <VANNOUHUYS>PSOMEETING.NLS;2, 8-NOV-72 10:13 BER ;

Visitor Log: John Alderete from Hewlett-Packard

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On ? September 1972 Walter and I met with John Alderete of Hewlett-Packard, Data Systems, 11000 Wolfe Road, Cupertino. 2

First I showed the system to Mr. Alderete, and he asked questions, particularly from the angle of whether the system would help a writer write better (faster?). 3

I said that if a writer were producing a document largely taken from references online (a cut and paste job) NLS could help him to work faster and better. 3a

If he was composing something out of his head which required a lot of organizational work, he could compose it faster and better in NLS because he could jot down his thoughts and reorganize them so easily. 3b

But if he were writing about familiar material in a continuous flow it didn't make much difference. 3c

Walter and I then met with him to discuss the documentation production and control system. 4

Again his questions centered around the idea of a system which would integrate bookmaking from the first rough notes to delivering the book to the final user. 4a

But with the emphasis on helping the writer. 4b

Mr. Alderete has been a programmer and works in product development for Hewlett-Packard but at the moment is on loan to their publications department. 5

The publications department has been using ATS but is dissatisfied and is "looking around". 5a

Somebody from the Hewlett-Packard publications department was here several months ago. 5b

We made it clear, of course, that NLS wasn't something that Hewlett-Packard's publication department could buy and install. 5c

I sensed wider applications were in the back of somebody's mind at Hewlett-Packard. 6

He told us that Hewlett-Packard will soon put on the market a

Visitor Log: John Alderete from Hewlett-Packard

next-size-larger computer called the 3000, a machine with 64K core, and was investigating the "publications system" for that machine. 6a

Walter and I suggested that if Hewlett-Packard was seriously interested in NLS they would want to buy into the plan to get NLS up on Tymshare and that if he wished to pursue that plan he should talk to Doug. 6b

Mr. Alderete was also interested in formal evaluations of such systems. 7

He had the recent article by van Dam on Online Text Editing in Computer Surveys. I gave him the old article on evaluating the mouse and keyset and promised to send him (pending Bair's approval) Jim Bair's (10872,) writings on evaluation of ARC. 7a

Later I did send them. I also know that he phoned Bair. 7a1

We also suggested that Mr. Alderete talk to Bill English at Xerox. 7b

He sent a thank you letter September 30 in which he said he looked forward to profitable meetings in the future, but we have not heard from him since. 7c

DVN 8-NOV-72 11:06 12607

Visitor Log: John Alderete from Hewlett-Packard

(J12607) 8-NOV-72 11:06; Title: Author(s): Van Nouhuys, Dirk H./DVN; Distribution: Bass, Walt, Meyer, N. Dean, Van Nouhuys, Dirk H., Auerbach, Marilyn F., Kaye, Diane S., Engelbart, Douglas C., Norton, James C., Watson, Richard W., Irby, Charles H., Engelbart, Douglas C., Bair, James H./DPCS DCE JHB; Sub-Collections: SRI-ARC DPCS; Clerk: BER; Origin: <VANNOUHUYS>JVHP.NLS;3, 8-NOV-72 11:03 BER ;

DVN MFA 8-NOV-72 16:38 12608

Plans for Parsley Activities Thanksgiving Week

It seemed natural to devote some of the time during Thanksgiving week when the computer will be down to Personal and Organizational development. We met to plan on Monday. After considerable discussion we arrived at the following schedule: 1

Monday 2

AM 2a

Activity: Redecoration 2a1

People Responsible: Environmental Committee (12579,) 2a2

Place: Display Area 2a3

PM 2b

Activity: Roles and Exercises 2b1

People Responsible: MFA DvN JDH 2b2

Place: Conference Room 2b3

Tuesday 3

AM 3a

Activity: ICCC Tensions 3a1

People Responsible: JDH DvN 3a2

Place: Conference Room 3a3

PM 3b

Activity: Roles and Exercises 3b1

People Responsible: MFA DvN JDH 3b2

Place: Conference Room 3b3

Wednesday 4

AM 4a

Activity: Discussion of the SRI Committee studying ARC management. Dave Brown will explain, answer questions, and ask questions. 4a1

Plans for Parsley Activities Thanksgiving Week

People Responsible: DvN DRB 4a2

Place: Conference Room 4a3

PM 4b

Activity: Party 4b1

People Responsible: MFA 4b1a

Place: ARC 4b1a1

Explanation of table: 5

Roles and Exercises: 5a

means various exercises used in the field of organizational development to practice and understand relations between people and all people with groups. 5a1

ICCC Tensions: 5b

Several of us observed that the pressure of preparation for ICCC put a lot of strain on the people involved and created various conflicts, and regret that this side of ICCC was not discussed in the post mortem. 5b1

It is not clear to everybody that ICCC was worth the hassle. 5b1a

Dave Hopper and Dirk van Nouhuys would like to use these tensions as a starting point for the special interest group in techniques in Personal and Organizational Development (11548,). We invite everyone, but particularly those most hassled to try to explore the conflicts from the viewpoint of learning how to handle similar conflicts better. 5b2

Dave Hopper will moderate this discussion; it will begain at 9:00 o'clock. 5b3

All activities are voluntary. We encourage everyone to take part in some activity, but we expect other ARC work to be going on in parallel. 6

We discussed two other matters of note at this meeting. 7

At Ken Victor's insistence we agreed not to have Parsley Meetings on Mondays in the future. 7a

Plans for Parsley Activities Thanksgiving Week

We agreed that Jake Feinler would replace Don Limuti as our ISAG representative pending Jake's consulting with Don. 7b

DVN MFA 8-NOV-72 16:38 12608

Plans for Parsley Activities Thanksgiving Week

(J12608) 8-NOV-72 16:38; Title: Author(s): Van Nouhuys, Dirk H., Auerbach, Marilyn F./DVN MFA; Distribution: Hoffman, Carol B., Lee, Susan R., Michael, Elizabeth K., Dornbush, Charles F., ARC, Guest O., Feinler, Elizabeth J. (Jake), Handbook, Augmentation Research, Kelley, Kirk E., Meyer, N. Dean, Byrd, Kay F., Prather, Ralph, White, James E. (Jim), Vallee, Jacques F., Kaye, Diane S., Rech, Paul, Kudlick, Michael D., Ferguson, Ferg R., Lane, Linda L., Auerbach, Marilyn F., Bass, Walt, Engelbart, Douglas C., Hardeman, Beauregard A., Hardy, Martin E., Hopper, J. D., Irby, Charles H., Jernigan, Mil E., Lehtman, Harvey G., North, Jeanne B., Norton, James C., Page, Cindy, Paxton, William H., Peters, Jeffrey C., Ratliff, Jake, Row, Barbara E., Riet, Ed K. Van De, Van Nouhuys, Dirk H., Victor, Kenneth E. (Ken), Wallace, Donald C. (Smokey), Watson, Richard W., Andrews, Don I., Brown, David R./SRI-ARC DRB; Sub-Collections: SRI-ARC; Clerk: BER;
Origin: <VANNOUHUYS>PARSLEYMEETING.NLS;4, 8-NOV-72 16:28 BER ;

DVN 8-NOV-72 9:57 12609

TTY Users Meeting

On November 3 at 11 the following people met with me to discuss allocation of the tty terminals available: 1

PR DSK HGL JAKE BAH MDK 1a

Before the meeting, Doug Engelbart moved himself on to the list of people who keep tty's at home (12479,). 2

We had a sometimes painful discussion in which various people urged that they deserved to have a tty permanently devoted to their home and/or office, and I pointed out that there were not enough tty's to go around. We came to the following decisions: 3

We agreed that Diane Kaye made good use of a T-I at home. 3a

Of the four remaining T-I's and Execuports, we agreed that one would be shared by Mike and Jake, one would be shared by Paul and Beau and the remaining two would float. 3b

At the moment one is floating in Beau's office and the other has been taken home temporarily. 3c

We noted one T-I had disappeared from general ARC use when it was given to Dean Meyer in Berkeley. 4

We concluded that two more T-I's would mean that in general people could get T-I's when they needed them and urged Operations to acquire two more. 5

I talked to Jim Norton later and he seemed amenable to leasing two more T-I's. 5a

I feel that the conflict over procedures and fairness in allocating T-I's will reappear and look forward to suggestions for handling it. I feel that the principle usefulness of this meeting was users' seeing the demand and the reasonableness of one another's needs. 6

DVN 8-NOV-72 9:57 12609

TTY Users Meeting

(J12609) 8-NOV-72 9:57; Title: Author(s): Van Nouhuys, Dirk H./DVN; Distribution: Hoffman, Carol B., Lee, Susan R., Michael, Elizabeth K., Dornbush, Charles F., ARC, Guest O., Feinler, Elizabeth J. (Jake), Handbook, Augmentation Research, Kelley, Kirk E., Meyer, N. Dean, Byrd, Kay F., Prather, Ralph, White, James E. (Jim), Vallee, Jacques F., Kaye, Diane S., Rech, Paul, Kudlick, Michael D., Ferguson, Ferg R., Lane, Linda L., Auerbach, Marilyn F., Bass, Walt, Engelbart, Douglas C., Hardeman, Beauregard A., Hardy, Martin E., Hopper, J. D., Irby, Charles H., Jernigan, Mil E., Lehtman, Harvey G., North, Jeanne B., Norton, James C., Page, Cindy, Paxton, William H., Peters, Jeffrey C., Ratliff, Jake, Row, Barbara E., Riet, Ed K. Van De, Van Nouhuys, Dirk H., Victor, Kenneth E. (Ken), Wallace, Donald C. (Smokey), Watson, Richard W., Andrews, Don I./SRI-ARC; Sub-Collections: SRI-ARC; Clerk: BER; Origin: <VANNOUHUYS>TTYMEETING.NLS;5, 8-NOV-72 9:55 BER ;

CHI 8-NOV-72 19:04 12610

Acknowledgement of (journal,12329,1)

Mike, this is to acknowledge that I have read your anotation note and am preparing a reply (I have thought about this problem some and proposed a way ov handling it some months ago, which I will re-propose). Since I am somewhat pressed to get the new monitor up, I must defer this until I have more time. Thanks for your interest and patience. 1

CHI 8-NOV-72 19:04 12610

Acknowledgement of (journal,12329,1)

(J12610) 8-NOV-72 19:04; Title: Author(s): Irby, Charles H./CHI; Distribution: Kudlick, Michael D./MDK; Sub-Collections: SRI-ARC; Clerk: CHI;

NLS organization notes: 1

A First Pass at some NLS re-organization 1

From doing call-return tracing and PC sampling it's pretty clear that NLS could benifit from some changes - in the direction of increased efficiency and better code orgranization. This is just a first cut: I'm sure there are lots more undiscovered things. Also, if anyone see's anything that would help, drop a note in the Journal, even if you make a change yourself, so that I can try to detect the improvement, and so that we have a record of it. 1a

Where "hand coding" is recomended, I mean a few instructions should be stuck in (in L10 still) to get better code than L10 produces. 1a1

I volunteer to do the hand-coding unless someone else would like... 1a2

Here is a list of important things: 1b

(utilty,ascom) is called whenever two strings are compared (the compiler produces the call). The damn thing compares the strings a byte at a time (which isn't so bad by itself) and it computes a byte pointer to each byte each time. I think we should stick a hand coded routine in here to do it a word at a time. Smokey has one such routine in BSYS which he stole from the system. I suggest we modify it (to do the right thing per relations, etc.) so that it will work in NLS. 1b1

(utilty,compas) compares two a-strings and returns TRUE or FLASE. This could use the same code as ascom, no? 1b2

The input routines should be better organized. I suggest the following: 1b3

Put UNPUT in front of INPUT. 1b3a

Move (auxcod,nlcrms) to follow (inpfbk,inpt0). 1b3b

Move TINPTC, TODCHR, RAWCHR, SHIFT, so that they are together. 1b3c

A simple way of turning off the name area is needed - at least a way to avoid calling DN each time a routine wants to MAKE SURE the name area is blank. It seems a bit bizaare to go thruogh the whole thing of displaying a null string just to turn it off 1b4

In utilty, MVBFBF should be moved to follow CPYSR. 1b5

In filmnp, LDRNG, LODSDB, and FRZBLK should be together. 1b6

Finally, (utilty,chbptr) is very small, but uses around 2% of NLS execution time. It is partly because of calls in (utilty,ascom) but it would be good to hand code it. It could be coded inline in (utilty,apchr) and (utilty,ldchr), since it is very often called from there. 1b7

Some less important things that might be considered: 1c

(utilty,stbptr) is nearly the same as chpbtr mentioned above, and could be improved at the same time. But alas, it is not often used and not much time would be gained. 1c1

(utilty,apachr), (utilty,ldchr) and (utilty,apchr) are used alot and could be hand coded with half word operators and sped up. but they account for a small amount of total time. 1c2

DSK mentioned something about getting rid of (dspgen,getrta) since all it does is return a table entry. It probably takes as long to do the call as it does to get the address and check the bounds... 1c3

Calls to (utilty,chbptr) with a argument of empty could be avoided if there was a global constant for empty-string-byte-pointer. I noticed such a call in (inpfbk,cfldsp): for all I know this is the only place. 1c4

A suggestion: We may want to do this now, or in MPS. 1d

There are several functions that are very frequently performed, many of them are procedure calls produced by the L10 compiler, such as calls to chbptr, archr, ldchr readc, etc. 1d1

It seems reasonable to me that some of these low level functions should be USER JSYS's. This would be a very fast way of getting to a piece of code that did not call any procedures, had a small number of arguments (passed in the registers), and was fast enough (in execution time) that the call-return mechanism was a significant addition to its execution time. 1d2

A user JSYS is a JSYS instruction with an address greater than 1000B. The cell at that address contains

an address to stick the return location into (which could be a register), and an address to start executing at. 1d2a

READC is the only function I know of that is given such special treatment. It would be worth considering if, and what others should get special treatment also. 1d3

READC happens to be a JSP routine, not a JSYS. JSP is even faster. Perhaps JSP is the kind of call we should consider; 1d3a

A few candidates are LDCHR, APCHR, CHBPTR, ASCOM, ASSREF, GETRTA. 1d4

Whether done with JSYS or JSP, it should be possible to call the "procedure" from inside an expression (specifying arguments in parens) and get a result. It would be nice if one could do this with TENEX JSYS's also. 1d5

This is an encroachment on the elegance of L10, but I think it could be done cleanly. It's hard to say what the improvement would be in terms of % execution time. What are your reactions? 1d6

One last thing: who's going to make these changes? 1e

I am willing to do the "hand-coding" and the moving of code, but I don't know who to address other suggestions to. So volunteer and send me a note 1e1

DIA 8-NOV-72 20:39 12611

NLS organization notes: 1

(J12611) 8-NOV-72 20:39; Title: Author(s): Andrews, Don I./DIA;
Distribution: Irby, Charles H., Kaye, Diane S., Lehtman, Harvey G.,
Hopper, J. D., Bass, Walt/CHI DSK HGL JDH WLB; Sub-Collections: SRI-ARC;
Clerk: DIA;
Origin: <ANDREWS>NLSNOTES1.NLS;6, 8-NOV-72 20:24 DIA ;