GAS2 18-MAR-75 19:16 32122

Missing GAS2 in KWAC group Ident

Please include my Ident in the group ident KWAC...KWAC NEEDS GAS2!!! 1

GAS2 18-MAR-75 19:16 32122

Missing GAS2 in KWAC group Ident

(J32122) 18-MAR-75 19:16;;;; Title: Author(s): Glenn A. Sherwood/GAS2; Distribution: /FEEDBACK([ACTION]) ; Sub-Collections: NIC FEEDBACK; Clerk: GAS2;

DLS 19-MAR-75 06:45 32123

Procurement PaperWork for the NIC AF30602-75-C-0123

Now that we have a contract, I am journaling the NIC procurement file,,,need the space,

DLS 19-MAR-75 06:45 32123

Procurement Paperwork for the NIC AF30602-75-C-0123

(prop)osal 1

<norton>jcnarpaprop...@ ARC (mjournal,22849,) 1a

(sow) 2

pages 7 & 8 of proposal 2a

(pr) 3

2. Objective 3a

The objective of this effort is to continue the ARPANET Resource Handbook and Directry efforts started under the Network Information Center task--under contract F30602-72-C-0313, ref. ARPA Order 2842 3a1

3. Follow-on funding 3b

25K 3b1

6. Coor req. 3c

yes, yes, ARPA 3c1

7. Resour. req 3d

no 3d1

8. RC/CC 3e

276702 3e1

12. Term of contract 3f

12 mo 3f1

14. Unsol. Prop 3g

NA 3g1

15. Sole Source Company 3h

SRI 3h1

16. Contract num. 3i

N/A 3i1

17, Job order num	3j
28420101	3j1
20, Type buy	3k
B--sole source	3k1
21, Buying agency	3l
1--local	3l1
22, Title	3m
ARPANET Information Center	3m1
24, BPAC	3n
5P102842	3n1
25, PEC	3o
62706E	3o1
26, Fund User	3p
ISI	3p1
27, Lead Div	3q
IS	3q1
28, Proj	3r
2842	3r1
29, Task	3s
01	3s1
30, Line no	3t
01	3t1
31, Source	3u
ARPA	3u1
32, Funds	3v

77K 3v1

33. PR num 3w

B-5-3256 3w1

34. Change 3x

(memos) 4

(sole) source 4a

(eval)uation 4b

(dia)log 5

12-JUN-74 1322-PDT RADC-DOR at USC-ISI: EXTENSION OF SRI EFFORT
Distribution: STONE AT OFFICE-1, KENNEDY AT OFFICE-1
Received at: 12-JUN-74 13:21:05 5a

I RECEIVED THE FOLLOWING MESSAGE TODAY. I THINK THAT THE "NORMAL" 120
DAYS IS PROBABLY APPROPRIATE. DO YOU KNOW OF ANY REASON THAT IT SHOULD
NOT BE? PLEASE ADVISE.
12-JUN-74 08:40:32,767
Date: 12 JUN 1974 0840-PDT
From: EDWARDS
Subject: FOLLOW-ON TO AO 967 WITH SRI
To: RADC-DOR
cc: EDWARDS 5a1

JACK,
I AM IN PROCESS OF PREPARING A NEW AO (2842) TO GET A NEW CONTRACT
WITH SRI FOR A 12 MONTH 'CONTINUATION' OF THE NETWORK INFO CENTER
(NIC).YOU WILL RECALL THAT THIS HAS BEEN ONE TASK UNDER THE SUBJECT
AO 967.
WHAT I NEED, FOR PURPOSE OF FIGURING WHAT PART OF THE 12 MONTHS FUNDING
TO INCLUDE, IS YOUR BEST GUESS ON WHEN THE CONTRACT MIGHT BE INITIATED.
WE WILL NOT BE AUTHORIZING PRE-CONTRACT COSTS OR REQUESTING ANY SPECIAL
TREATMENT AND WE RECOGNIZE THIS WILL CAUSE A GAP BETWEEN OLD CONTRACT
AND THE NEW ONE.

ASSUMING YOU GET THE SIGNED AO BY 1 JULY WHAT IS A REASONABLE DATE FOR
PROCUREMENT TO COME TO FRUITION??
FRED,

HEY ED-IT LOOKS LIKE IT'S WORKING--LET ME KNOW--JACK, 5a2

19-MAY-74 1835-PDT RADC-DOR at USC-ISI: SRI CONTINUATION (CONTRACT 0313,ETC)
Distribution: STONE, RADC-DOR
Received at: 20-MAY-74 00:35:30 5b

DURING MY RECENT VISIT TO ARPA, I CHECKED ON YOUR QUESTIONS RELATING TO
POTENTIAL CONTINUATION OF SRI WORK, I DETERMINED A FEW SALIENT FACTS,
FIRST, ANY CONTINUATION OF SRI SPONSORSHIP WILL NOT BE IN THE MILLION-
PLUS LEVEL, BUT AT A SIGNIFICANTLY LOWER LEVEL, SECONDLY, NO FIRM
DECISION ON ACTUAL ACTIVITY TO BE SELECTED HAS BEEN MADE TO DATE,
THIRDLY (THIRDLY?)- THERE WILL BE A DEFINITE HIATUS IN FUNDING, REGARD-
LESS OF DECISION ON FUNDING LEVEL, IN VIEW OF THE SITUATION, ANY ACTION
TO CRANK UP PAPER-WORK WOULD BE PREMATURE, I SUGGEST ADDITIONAL
TRAFFIC A LITTLE LATER WTIH THE TECH MONITOR TO SEE IF THEY HAVE JELLED
THEIR THINKING--REMIND ME, O,K,? 5b1

13-MAY-74 To Runninger 5c

The effort amounts to $1,340,00...about...for a one year effort in four areas: 5c1

1, support to the MST program 5c2

2, support to the NSW program 5c3

3, additiooonal NLS development 5c4

4, the operation of a 10X facility 5c5

5c6

MST= Management Sciences Technology 5c7

NSW= National Software Works 5c8

NLS= oN Line System 5c9

10-MAY-74 0654-PDT RADC-DOR at USC-ISI: SRI EXTENSION (0313)
Distribution: STONE
Received at: 10-MAY-74 06:55:15 5d

THE ONLY INFORMATION THAT I HAVE TO DATE IS AN AMOUNT OF $70K WHICH
HAS BEEN PROGRAMMED BY ARPA TO EXTEND THIS EFFORT, BUT NOT YET REDUCED
TO AN ORDER. DOES THIS AMOUNT COME ANYWHERE NEAR THE PROPOSAL WHICH
YOU REFERENCE? IF NOT, WHAT IS THE AMOUNT?
IF IT HELPS, THE $70K IS PROGRAMMED AGAINST "NLS SUPPORT OF DEIS"--
PLEASE ADVISE--JACK, 5d1

8-MAY-74,,,to: Runninger 5e

The current ARPA effort with SRI,,contract 0313,,will end on 30 June 74. I understand that ARPA has been talking with SRI about an additional year's support. I have a draft proposal that I uncovered in SRI files, which will allow me to estimate $, manpower etc....SRI Proposal ISU 74-78. It should be very close to the final version. Could you check with ARPA to see if they intend to fund this proposal? We could come a lot closer to the 1 JULY 74 start date if we get started now.ThanksStoney 5f

DLS 19-MAR-75 06:45 32123

Procurement Paperwork for the NIC AF30602-75-C-0123

(J32123) 19-MAR-75 06:45;;;; Title: Author(s): Duane L. Stone/DLS; Distribution: /ELF([INFO-ONLY]) ; Sub-Collections: RADC; Clerk: DLS;

quest

pf on March19/75 1

Required to use NLS? Was looking forward to NLS because had used SCRIPT text-editor and liked it. Though was not forced to use it , had I not been favorably disposed to using it, I don't think LHD would have been out of line in greatly encouraging (moral suasion) me to use it even if I was less efficient using it than conventional means....it is cosyting Bell Canada $120,000 plus per year to be on this system and I don't think management is out of line in 'strongly' requesting us to put ourselves out, if necessatry and use the system. 1a

Job description include NLS? I think so, We have a tremendous amount of freedom in this group to use nesw techniques, services etc, in comparison to the rest of Bell and if we are not open to new ideas (e.g. augmented worker) than who is? 1b

1c

Encoureaged to use system? Actually I was all set to start bfore Bell was ready. Iused SCRIPT texteditor in July 1973 and liked it. We got the terminals in around Nov 1973 but did not yet have a dedicated slot so only MTB could use it. On NOV 29 1973, MTB was showing PIW how good the sytem was(PIW was skeptical about typing in stuff) ans I klooked over their shoulders. Within a few days both PIW and I were usinfg it quite well (albeit on a simple level). 1d

Trained for system? About one hour's worth of training all tt was neded to get me going on simple text-editing (whicjh satisfies 90% of needs) 1e

Demionstaration of Capabilities? A few brief demos by Jim Bair but not enough. I would like to see a few formal sessions biy Mike or Inez which would show off some of he more esoteric features(ironically when showing NLS to guests of BPG they probably get better view of NLS than say PIW and I have(we use system very similarly-at simle level) 1f

Used similar text-editing system? Yes I've written two working papers on-line IBM SCRIPT. While NLS has as a subset of it virtually every other text-editing sytem and is tautologivcally superior to any single other sytem, I'd say 90% of business applications can be easily handled on a simle stand alone testxt editor(e.g. usins IBM SElectric). The marginal cost of going from one of theses systems(S5000/yr) to NLS (120,000) per year cannot economically be justifeied because of the very modest gains that are accrued in the vast majority of application (typing up 2-page memos and letters9). Tgough time is on NLS's sidé since computer

costs and communications will either diminish or be sharply cut , the fact that you need so many terminals with caccompanying installation problems, maintenance problems, as well as extara office space (an increasingly expensive item) will keep NLS costs significantly above other stand-alone or shared logic syystems,. For this reason I do not thing that NLS will be a vianble business offering for many years to come, if ever. 1g

Security problems? Before people can use computer conferencing, or text-editing well they will nave to unlearn some bad nabits (e.g. mor tolerance of typos in text as opposed to types letters, and the fact that there is sa RECORD of what has been discussed, For this reson, I have myslef to be very open in my file with thoughts that one ordinarily would not put on paper if it will be in a place where it might be read. So far I've had no problems since very few people go into others' files and what is critical to the writer may be very humdrum to the person going through the author's files (also I use security code very confidential code though I rsealize that anyone at ARC could get in if they tries,) 1h

Tasks remotley? I have only typed in for messages, Haven't worked from the home beuse can never get terminal. I should try it just to see what it's like,(Thanks for the idea) 1i

Efficiency of medium? A rough guess is that PIW, MTB, LHD and PF are 30% more efficient with system, NLS will never pay its way on this basis, though, NLS was to have 'aumneted' the knowledge worker so that he could do things unimaginable before (Colin Cherry these in real benevite of new communication capabilities), I have not seen any evidence of this 'augmentaion,) 1j

How tasks done before? messages done by mouth or with piece of paper (worked very well),.Wroite reports done by typing and re-typing manuscripts (very inefficient),, text-editing is definitely wave of future(only I think it will be the cheap and simple tand alone editors) 1k

Reveiew other peoples work? no- I just ask them , it's simple and more efficient than having reams of garbage (i.e. of items of no i terest to me) beoing printed out, also I would feel a bit like I'm looking in their desk drawers and might be invading their privavcy (this is worng attitude since it defeats essences of NLS) (ah well, we all have outr hang-ups- I'll work on it) 1l

Access journals? very little transmitted this way 1m

Information exchange? just messages to Larry telling if I'm out of town 1n

Organiztion,? This is the onle case that I find paper much more efficient(whoops also use paper for brief letters - to much trouble to run back anfd forth to the printer) 1o

Reports? I've personally wriitten and edited and typed out in final version every paper and impt, memo I've written since July 1973. 1p

Editing reports written off system? find it easier to red pencil report than type in changes--much faster 1q

Purposes before? expected to use system to store all letters and to somehow become augmented, i.e. to be able to increase muy scope in new waye 1r

Functions at present?Reports , memos, messages 1s

Functios in future? my learning curce is saturated for present needs (i.e. use as simple text-editor) will not use more sophisticated or more efficient in future 1t

% on system? about 20% 1u

What purposes group will use ? same as now 1v

What purposes group is using? MK and JHK are using as simple stand-alone text-editor, PIW and PF as shared logic inexpensive text editor, MTB and LHD usinf some of the very great poewer of NLS though not nearly all that it's programmed for (no need for sll those commands in 99% of cases) 1w

Advantages? I don't like writing in pen (used to use typewriter) therefore this is very good substitute, It's faster(don't have to wait for clerk to type up manuscript 1x

Disadvantages? I see no disadvantages of this over converntional editing. My only problem is that on a cost basis NLS is and always will be cost ineffectivce in comparison to tother editirs already on the market 1y

General comments? I like doing my own text-editing in this particualr environment. In most environments it is probably wasteful to have mamnagers do their own typing. Idf typists will do the editing work only 5% of NLS capabilities will be used and new more cost-effective systems will evolve to meet these cheap and simple needs,... reievaluation,..I liked the idea of getting us into a consensor session to discuss how we feel abput he system,.....Good luck, Gwen 1z

PF 19-MAR-75 07:31 32124

quest

(J32124) 19-MAR-75 07:31;;;; Title: Author(s): Phil Feldman/PF;
Distribution: /GCE([ACTION]) ; Sub-Collections: NIC; Clerk: PF;

DLS 19-MAR-75 07:42 32125

NSW FE Procurement Paperwork AF30602-75-C-0156

Now that we have a contract, I am Journaling the procurement paperwork and precontract dialog...need the space.

NSW FE Procurement Paperwork AF30602-75-C-0156

(prop) 1

(,23352,1:xb) 1a

20-NOV-74 0952-PST HARDY at SRI-ARC: Revised NSW Proposal Schedule F (11/14/74),
Distribution: STONE AT OFFICE-1, watson, hardy, engelbart
Received at: 20-NOV-74 09:52:34 1b

Duane:
Journal (,24523,) is a new schedule F that was revised 11/14/74 during work sessions with the government auditors here at SRI. The reason for the changes is because we knew more exactly the particular equipment that would be used and their cost.
Could you have a copy of this new schedule F passed to your Price Analyses people as soon as possible to facilitate contract negotiation.
thanks,
...martin... HARDY@SRI-ARC 1b1

(eval) 2

NSW FE Procurement Paperwork AF30602-75-C-0156

RADC/ISIM (D. Stone/X3857) 19 MAR 75 2a

Technical Evaluation of SRI Proposal, ISU 74-132; in Response to PR B-5-3273 & PR B-5-3274, "NSW Frontend" 2b

RADC/ISIM
ISI
ISM
PMRB/Mr. Lemke
IN TURN 2c

1. The subject proposal has been evaluated in accordance with the established evaluation criteria, ref attached AFSC-65 and the attached ARPA Order No. 2853, Ammendment 1. 2d

2. The proposal from Stanford Research Institute (SRI) is acceptable for this procurement. SRI has been a leader in ARPANET technology and has been developing the interactive system NLS for a number of years. SRI has complied with the requirements of the work statement. 2e

3. It is recommended that award be made to SRI, who is uniquely qualified to accomplish this effort, ref attached ARPA MEMORANDUM FOR RECORD, "Selection of Stanford Research Institute to Develop Components of the National Software Works". 2f

4. It is recommended that any contract resulting with SRI be dated 1 JUL 74 and that SRI be allowed to submit charges from that date. SRI has been performing on subject effort since that date. If SRI had not continued with this effort the NSW project would have been irrepairably damaged, delayed at least a year and have cost at least twice as much. 2g

DUANE L. STONE 3 Attchs: SRI Tech Prop
ARPA Order
ARPA Memo 2h

Information Management Sciences Section
Information Processing Branch 2i
(sow) 3

NSW FE Procurement Paperwork AF30602-75-C-0156

ROME AIR DEVELOPMENT CENTER
GRIFFISS AIR FORCE BASE
NEW YORK

STATEMENT OF WORK

FOR

NATIONAL SOFTWARE WORKS FRONTEND

PR B-5-3273 & B-5-3274

19 MAR 75

TABLE OF CONTENTS

RESEARCH AND TECHNOLOGY WORK STATEMENT

1,0 Objective: The objectives of this effort are to develop a frontend and protocols for the National Software Works (NSW) and to make the oN Line System (NLS) an effective NSW tool.

2,0 Scope: This effort includes:

the development of minicomputer software to act as the frontend for the NSW,

the development of ARPANET and NSW protocols,

the restructuring of the oN Line System (NLS) to make it compatable with the NSW and

the development of documentation and programming enhancements to NLS, to support the AF Data Systems Design Center at Gunter AFS and the AF Data Services Center in the Pentagon.

3,0 Background: The Air Force software development process is unduly expensive and yields relatively unreliable systems. This situation could be markedly improved by giving AF programmers and managers access to advanced tools and methods designed to aid the software production process. Many of these tools exist at sites on the ARPANET, but are not accessible to the AF software production teams. The overall goal of the NSW is to make these tools and methods available to AF programmers. The NSW consists of 4 major components,

the Works Manager or executive system,

the Foreman, or implementor of the managers's command,

the Frontend which provides a coherent user interface to the NSW

and the tools themselves.

The works manager, foreman and hardware interfaces are being developed by other contractors. To complete the NSW project, a user oriented interface must be built, protocols for communication between tools and the works manager must be developed and tools must be interfaced according to the protocols. Since NLS is to be the initial tool offered via the NSW, it must be reconfigured to interface with the NSW.

4.0 Tasks/Technical Requirements:

4.1 The contractor shall provide engineering services to design, develop, test and deliver a software package for an NSW frontend system.

4.1.1 The contractor shall lease an appropriately sized PDP-11 and obtain time on a PDP-10X to support the NSW frontend software development effort.

4.1.2 The frontend software shall run under the ELF and TENEX operating systems, be capable of remote debugging and maintenance and run on either a PDP-10X or a PDP-11.

4.1.3 The frontend software will allow the user to access all the tools attached to the NSW. All commands to the works manager will be given through the frontend. The frontend must be able to accommodate a diversity of grammars and user profiles in a consistent manner. These will be tool dependent and will be automatically loaded into the frontend from the works manager upon the users' request to use a particular NSW tool.

4.2 The contractor shall provide engineering services to administer the NSW protocol development. Protocols which may need modification and further development include: host to host, file transfer, telenet, and graphics. This responsibility shall include:

4.2.1 overall coordination and management of the NSW protocol development.

4.2.2 participation in the specification of standards for protocols; their measurement and documentation.

4.2.3 documentation of a proposed protocol; its nature, use and effects.

4.2.4 coordination of the implementation of the NSW protocols.

4.2.5 measurement, testing and evaluation of the implemented protocols.

4.2.6 publication and distribution of test results.

4.3 The contractor shall provide engineering services to integrate NLS into the NSW environment. This shall include:

4.3.1 completion of NLS-8 and its transfer to Office-1 as the standard NLS system to be accessed by NSW users.

4,3,2 division of NLS-8 into a frontend and backend components, to ensure compatability with the NSW environment,

4,3,3 modifications to the NLS file system to ensure compatibility with the NSW,

4,3,4 production of special NLS user interfaces as necessary.

4,4 The contractor shall provide engineering services to modify NLS-8 to specifically support the initial users, These users include AFDSDC and AFDSC personnel, Their use will generally fall into two categories; documentation and COBOL programming, The contractor shall:

4,4,1 prepare a detailed list of potential changes,

4,4,2 coordinate these proposed changes with AFDSDC, AFDSC, ARPA and RADC,

4,4,3 implement and document the agreeded upon changes,

5,0 Report Requirements:

Quarterly Management Reports

Final technical report

Protocol reports as required, (These shall be prepared using NLS and distributed via the ARPANET),

NLS modification user documentation (Instructions for use of the modifications shall be added to the on-line HELP data base, No formal documentation is required),

Software documentations (This shall consist of commented source code maintained in NLS files, No formal documentation is required),

6,0 Government Furnished Facilities and Equipment:

Contract residue from AF30602-C-72-0313

(pr)

2, Objective

3, Follow-on funding

N/a

PR B-5-3273 & B-5-3274

6, Coor req,

yes, ARPA, yes

7, Resour, req

no

8, RC/CC

12, Term of contract

12 mo

14, Unsol, Prop

yes--SRI-ARC 23352, # ISU 74-132

15, Sole Source Company

Stanford Research Institute

16, Contract num,

17, Job order num

55500819

20, Type buy

21, Buying agency

Local--PM

22, Title

National Software Works Frontend

24, BPAC

25, PEC

26, Fund User

27, Lead Div

28, Proj

29, Task

PR B-5-3273 & B-5-3274

30, Line no

31, Source

32, Funds

33, PR num

B-5-3273

B-5-3274

34, Change

(memo)s

DLS 19-MAR-75 07:42 32125

PR B-5-3273 & B-5-3274

RADC/ISIM (D. Stone/X3857) 19 MAR 75

Precontract Meeting on SRI Proposal, ISU 74-132; in Response to PR B-5-3273 & PR B-5-3274, "NSW Frontend"

RADC/ISIM
ISI
ISM
PMRB/Mr. Lemke
IN TURN

1. The categories and number of manhours in subject proprosal are necessary and sufficient for performance of subject effort.

2. The trips to Washington are necessary to coordinate the overall effort with the NSW steering committee, to Boston to coordinate development efforts with MCA (the other principle NSW development contractor) and to Montgomery to install, debug and train the initial NSW user (AFDSDC).

3. The computing facility and terminal equipment (listed in SRI doc # 24523) are necessary and sufficient for performance of subject effort. The facility at SRI will be removed 1 Mar 74. Its operation has been supported through 1 Jan 75 under F30602-72-C-0313. There is not sufficient capacity on the Office-1 machine to support the development team for subject effort. Therefore, it became necessary to procure computer time elsewhere on the ARPANET, namely from BBN. The terminal equipment is also necessary, since the current display system cannot operate over the ARPANET, and must therefore be replaced.

4. The material, supplies and documentation are necessary and sufficient for performance of subject effort.

DUANE L. STONE
Information Management Sciences Section
Information Processing Branch

DLS 19-MAR-75 07:42 32125

NSW FE Procurement Paperwork AF30602-75-C-0156

(J32125) 19-MAR-75 07:42;;;; Title: Author(s): Duane L. Stone/DLS;
Distribution: /ELF([INFO-ONLY]) MAW([INFO-ONLY]) ;
Sub-Collections: RADC; Clerk: DLS;

initial plan shown to Mac...basic revisions to be mmade include deletion of reference to other AF org support and inclusion of application to language control facility.

NLS Application and Development Plan---DRAFT

GOAL: 1

The overall goal of this project is the application of NLS within RADC and to other AF organizations. The reason for augmenting RADC first is not just parochial, but that we might act as a test bed for development, refinement and evaluation of the system and associated equipment and procedures before they are introduced into the AF operational community. 1a

The acceptance and use of NLS at RADC over the past three years has been slow for several reasons. The conditions prevailing in the past have changed as indicated below. 1a1

The system itself was shakey. Development and operational use were going on in parallel on the same machine, leading to confusion and unreliability. 1a1a

With the advent of Office-1, the operational use of the system was stabalized, the reliability of the system improved, and changes held to a minimum. The development of NLS is now done on a seperate machine, and periodic debugged releases made...NLS-8 being the latest. 1a1a1

Considerable capital investment in equipment and training was required. 1a1b

The cost of workstations to run DNLS has dropped from 16K to 5K, the cost of computer time and related services has dropped 31% from $8.01 per available connect hour to $5.49, there is a body of reasonably well trained people at RADC. Further drops in cost are expected during 76, due to the use of a Front End and the movement of the Back End to the MULTICS machine. 1a1b1

Management at the ISI and IS levels did not perceive the benefits to be gained from using NLS. 1a1c

Although there is no direct use of NLS by the ISI management, there is a generally increasing awareness of its utility. IS management has begun to use the system on a daily basis in an elementary way. 1a1c1

Applications to the outside world were not clear. 1a1d

NLS is now being used by ARPA, ARMY, NAVY, NSA and a number of commercial organizations. The number of using organizations are growing in breadth and depth. NLS was chosen by the NSW community to be their principle

"working medium". NSF and the Academy of Sciences are starting projects employing it. 1a1d1

ROLES: 2

Given the above facts, I think there are several useful roles that the "hardcore" NLS pushers at RADC can usefully assume, (if properly infused with manpower and dollars). The roles are based on the following assumptions: 2a

NLS has passed through the critical "evaluation" stage here at RADC. It will be used henceforth in an operational mode to augment individuals, teams and management within IS. 2a1

NLS use is growing throughout the DOD community. New users will need special subsystems, training, and help in applying it within their respective environments. Since RADC has more experience in using NLS than any other organization in DOD, we can provide an invaluable "engineering services" role to organizations just starting. 2a2

NLS is worthy of developmental effort in its own right. It is not finished, in the sence that there are additional subsystems and interfaces to other systems which should be developed to round out its capability. 2a3

Growth within RADC 2b

The rest of ISI should be brought up on the system as soon as possible. Without a complete branch using NLS, many of the management and organizational related uses of the system are not possible. The tracking of travel, procurements, contract status etc. is confusing and overlapping when one section is using NLS and the other not. The result is duplicative effort and incompete data bases. Too often the system is used as an expensive Xerox machine, where files are input for the sole purpose of printing them out again. Use of the system should also be extended to the section office level within the other branches, to provide a skeletal chain-of-command capability. The installation of a terminal in procurement would also save a lot of time, confusion and hand carrying of paperwork. 2b1

Procedure development 2b1a

Extension of the system from individual use to organizational use requires that standard procedures, file formats, and methods of relaying information be developed. All involved must understand and use these if it is to work. Standard procedures are needed when using

NLS, just as they are in the conventional manual office environment. 2b1a1

A system for handling travel requests, estimating the expense and forwarding the estimates has been developed. It awaits implementation and refinement based on experience. 2b1a2

A system for tracking technical efforts (effort write-ups), based on the TPO organization is available and has been used sporadically within ISIM. The procedures are known, the file structure has been refined, it awaits implementation as the standard means of tracking technical efforts. 2b1a3

A means of accounting for time expenditures has been designed. It was never implemented, because at the time no one was very interested in tracking time. 2b1a4

File formats for tracking efforts in procurement (precontract) are in use in ISIM. These include directives etc. for automatically preparing memos, SOW's, Sole Source statements, and 77's. These need to be generalized and put into practice. 2b1a5

Command branches, content analyzer patterns, recorded sessions, and L-10 user programms have been constructed to allow manager's snapshot views of these files with little effort on their part. 2b1a6

Procedures for handling large documents, COMing them, for handling address lists, for doing repetitive calculations, etc have been developed and documented. They are not in general use, however. 2b1a7

Training 2b1b

Training of users at RADC has always been on a hit or miss basis. We are entitled to basic training from SRI as part of our purchased slots. Advanced training, however will have to come from internal resources, since it should reflect the particular applications we are attempting. NLS seminars have been held in the past, but since there was little standard use of the system, these were limited to general techniques for handling messages, organizing initials' files, etc. 2b1b1

Equipment 2b1c

We have a reasonable complement of equipment to handle the current set of users. An increased user population will require additional terminals. I recommend that only display terminals be acquired in the future. They are a lot more powerful than the TTY types for editing, viewing, etc, and offer capability like split screens that cannot be obtained with the TTY's. It does not seem unreasonable to have at least one in each room involved in using NLS. This means roughly 20 displays. 2b1c1

The cost of displays for running DNLS has dropped dramatically. Almost any commercial CRT that has addressable cursor can now be used. This is possible due to the development at SRI of something called a "line processor", which allows the interface of CRT, mouse, keyset, and communications line. Other devices for special applications can also be interfaced; such as a graphics terminal, local printer and casssette recorder. 2b1c1a

Engineering Services in Support of AF Organizations 2c

Assuming that we have a body of knowledgeable NLS users at RADC, we will be in an unique position to assist organizations just starting to use NLS, particularily within the NSW community. 2c1

Document Production 2c1a

AFDSDC scenerios explicitly call out document preparation, revision and publication as one of their chief uses of the NSW. Significant acculturation* must occur before they will be able to perform this function gracefully using NLS. RADC should be able to accelerate this process in an orderly manner. 2c1a1

* "modifications in a primitive culture resulting from contact with an advanced society"...Webster 2c1a1a

AFDSC is experimenting with a 4000 page manual which they would like to input, edit, format and publish using NLS. They could benefit greatly from our experience here in publishing large documents if we had time and manpower to devote to assisting them. 2c1a2

Office Automation 2c1b

AFDSDC scenerios also call for using NLS to support this function. Although not the highest priority in most

organizations, it is the application on which most seem to begin, probably because it is a familiar and visible area, 2c1b1

ARPA, ARMY and NAVY groups have all asked for support in this area, but we have been unable to give them other than cursory assistance, 2c1b2

NLS Development 2d

ISIM use of NLS to date has led to the identification of additional subsystems, improvements to existing ones and interfaces to other systems that are necessary before a full complement of tools is available. Although they have arisen out of our use of the system, they are generally desired by the NLS using community, as evidenced by the last architects' meeting. Many of these efforts are or can be covered under the NSW program. It should be understood, however, that their development within the NSW environment does not mean that they will automatically be available on Office-1 2d1

Graphics Subsystem 2d1a

The ability to deal with intermixed line drawings and text has long been recognized as essential to NLS if it is to adequately support document production. This subsystem is currently being developed under the NSW project. It will need further refinement and transfer to the general NLS users' environment, 2d1a1

Forms Subsystem 2d1b

Within the DOD environment, NLS will always have to interface with the "official" outside world. This interface is particularly cumbersome now, where form oriented data is concerned. A complete design of a forms system has been worked out through several iterations between SRI and RADC. It allows interactive preparation of the form template, prompts and error checks the user when filling out the form, and formats the data for output in the appropiate box on the official form. The data is retained in the system in such a manner that it is easily stripped off for input to a Management Information System. The system is ready for implementation, 2d1b1

Calendar Subsystem 2d1c

Our experience with the "tickler" file and other means of

notifying people of meetings, due dates, etc, led to the design of a calendar system. Another independent design was created by SRI at about the same time. These need to be merged and coordinated with the architects' community. The system would allow anyone to insert data about an upcoming event, specified who should be notified, how far in advance and how often. One could also query the system to find anyone's schedule for any time period. 2d1c1

Sendmail Improvements 2d1d

The Sendmail subsystem needs to be worked on to improve its reliability, to allow multi-site capability and to add features such as sequential distribution. 2d1d1

Calculator Improvements 2d1e

The Calculator Subsystem should allow adding of columns and rows with a single command. It should be made programmable or an interface to BASIC constructed. It should be possible to have tables of data automatically plotted. The later capability may involve an addition to the Graphics Subsystem or an interface to it. 2d1e1

Interface to DM system 2d1f

NLS file structure is not well suited to searching for combinations of keys in a typical formatted data base. Most organizations, however, have a number of Management Information Systems used to track and control their resources. NLS provides an ideal "front End" for such a MIS, where data preparation and query formulation can take place. The NSW environment should make it possible to construct an interface between NLS and a Data Managment system in a straightforward manner. AFAA would like us to interface NLS to the Mead Data system at Avionics Lab. The Data Computer at CCA is another candidate. Local data management systems are also candidates if GECOS is integrated into the NSW environment. 2d1f1

DEVELOPMENT PLAN: 3

Resources 3a

People 3a1

Dollars 3a2

Time 3a3

NLS Application and Development Plan---DRAFT

(J32127) 19-MAR-75 09:46;;;; Title: Author(s): Duane L. Stone/DLS;
Sub-Collections: RADC; Clerk: DLS;

RMS2 19-MAR-75 11:21 32128

Equipment trades and information

Please let me know what the chance are of for carrying out some of these suggested trades in equipment

Equipment trades and information

Because of the expanding users group within the MIT seismic allocation it has become necessary to consider expanding our equipment inventory. In addition to the increased number of users at Lincoln Laboratory there are people that have been added to the growing list of Office-1 users that will, or may, need equipment such as the DNLS setup. What this note is all about is to try to do some "horse trading" in order to clear up some of our equipment deficienties (such as a non working Techtran) and improve our ability to operate at office 1 more effectivly. 1

It is my understanding that we are allowed the following equipment. 2

1 DNLS package 2a

2 TI silent 700 terminals 2b

2 Techtran cassette recorders 2c

With all this in mind let me expand on the trading and questions that concern Lincoln Labs and Office-1, 3

DNLS DISPLAY EQUIPMENT 3a

We just received the DNLS display unit the Datamedia 2500, Would it be possible to get another DNLS unit like this in exchange for some of our allocated equipment. Namely, cane we trade 1 TI 700 and 1 Techtran for 1 DNLS Datamedia 2500? There is also the distinct possibility that some other users with the MIT Seismic allocation will want a Datamedia 2500.... How much will it cost to lease 1 unit for a year and what arrangements can we make to this effect? 3a1

TI 733 ASR WITH UPPER AND LOWER CASE 3b

Can we trade the second TI and the second Techtran for a TI 733 ASR with upper and lower case? This trade will enable use to try the DEX system. As it stands now, the Techtran that you sent us will not work with any of the TI 700's that we now have. I will be sending that unit back to you shortly. 3b1

DNLS FOR USE WITH TEKTRONIX 4014-1 DISPLAY TERMINAL 3c

Would you have any idea if it could be possible to connect a Lineprocessor (Keyset and Mouse) up to a Tektronix 4014-1. We have 2 of these units and they provide us with the capability to display at least 4-5 times the number of lines pre display page then do the Deltadata or the Datamedia. This is a requirement for some people and it would be a very powerful

tool if we could get a Lineprocessor tied into the unit. Can you give me some idea of the complexity of this operation/? 3c1

USE OF "MOUSE" ON OUR COMPUTER <INDEPENDANT OF OFFICE-1 WORK> 3d

We would like to adapt the concept of the "MOUSE" to some of our work ,both within the MIT Seismic allocation and within our own environment on the PDP-11's and the PDP-7's. In order to do this we would have to obtain a diagram of the Lineprocessor board that does the A/D for the mouse and some idea of output values and power requirements for the unit. Would it be possible to obtain enough information about the mouse (including cost and boards) to make an evaluation of this idea? 3d1

TRAINING FOR USERS AT ALBUQUERQUE, NEW MEXICO 3e

We are bring up some new users of NLS at Office-1. These people are located at the Kirtland Air Force base in Albuquerque, New Mexico. What arrangements can we make to have some training persons from SRI visit them for about 2 days of NLS training? 3e1

Also, in connection with these new people ..... I have ask feedback to set up 4 new directories for me OVER TWO WEEKS AGO. Why do I have to wait that long for new directories to be setup? Is there anything that Jim Norton can do to help get these new directories started? I would appreciate any help I can get with this problem ... it is getting to be serious at this point. 3e2

Equipment trades and information

(J32128) 19-MAR-75 11:21;;;; Title: Author(s): Robert M. Sheppard/RMS2; Distribution: /JCN([ACTION]) MEH([ACTION]) RTL([INFO-ONLY]) ; Sub-Collections: NIC; Clerk: RMS2; Origin: < SHEPPARD, TRADE,NLS;3, >, 19-MAR-75 09:57 RMS2 ;;;;####;

KM 19-MAR-75 11:43 32129

Our list of goodies.

Jim , 1

Here is the list we have compiled, I thought it would be of value to you to see it before I arrive (on 27th March). 1a

Keith, 1a1

NSA's Network Management Facility 2

Initial Size 2a

Core - 160K words 2a1

Disk - 80K pages 2a2

Swap Device - 1 High Speed Device 2a3

- possibly 1 Low Speed Device 2a4

Terminals - 10 @ 300bps 2a5

- 4 @ 4800bps 2a6

Current Implementation Schedule 2b

Snapshot of ARC's system for transfer to NSA	Summer 1975	2b1
Delivery of hardware to NSA	Sept-Nov 1975	2b2
Tenex/NLS available for use	Dec 1975	2b3
Possible upgrade of hardware and software	late 1976	2b4

Desired Software to be Transfered 3

Unless otherwise stated, source code and documentation are needed for all items. 3a

Tenex 3b

ARC's Tenex system - including :- 3b1

Exec 3b1a

Our list of goodies.

standard subsystems (eg, TECO, DED, RD) 3b1b

documentation of ARC's Tenex/JSyS changes. 3b1c

Protocol Handler modules (both User and Server) - Telnet, FTP, RSEXEC (RSSR), RJE, RJS, SNDMSG, 3b2

Source code and available documentation on Net Graphics if possible. 3b2a

Source code listings of the NCP and the Protocol handlers would be of value if they were available as soon as possible. 3b2b

Other subsystems 3b3

Including Mailer, Downtime, Spooling, RUNFIL, TIPCOPY, BANANARD. 3b3a

Archiving and Retrieval Programs 3b4

Group Allocation Scheme modules 3b5

Accounting modules 3b6

Including SUPERWATCH, Count of accesses program. 3b6a

Bug Notification modules - BUG, FEEDBACK 3b7

NLS 3c

Editor - user profiles, Help 3c1

Subsystems 3c2

Journal 3c2a

Sorter, Compile and Sort programs 3c2b

Our list of goodies.

Calculator	3c2c
Number	3c2d
Ident File subsystem	3c2e
Message	3c2f
Catalogue Processing programs	3c2g
Publish	3c2h
Output Processor	3c2i
DEX	3c2j
Programs - including L10 and CML	3c2k
DNLS capability (but only line processor at present - maybe IMLAC at a later date)	3c3
User Programs	3c4
INSEGH or its derivative	3c4a
NLSXFER	3c4b
ADDTEXT	3c4c
APPEND	3c4d
All appropriate documentation from USERGUIDES	3c5

KM 19-MAR-75 11:43 32129

Our list of goodies.

(J32129) 19-MAR-75 11:43;;;; Title: Author(s): Keith McCloghrie/KM; Distribution: /JCN([INFO-ONLY]) JNH([INFO-ONLY]) KM([INFO-ONLY]) ; Sub-Collections: NIC; Clerk: KM; Origin: < MCCLOGHRIE, NLSTRANSFER.NLS;6, >, 19-MAR-75 11:40 KM ;;;;####;

FGB 19-MAR-75 11:45 32130

test

Directory: MATHSCI 1

Users:	Ident:	
Elizabeth Cuthill	EHC	1a1
Harold Doerfel	HD2	1a2
David F. Eliezer	DFE	1a3
Allen Hankinson	AH	1a4
James J. Goertz	JJG2	1a5
John B. Smith	JBS	1a6
Harley E. Tillitt	HET	1a7

FGB 19-MAR-75 11:45 32130

test

(J32130) 19-MAR-75 11:45;;;; Title: Author(s): Frank G. Brignoli/FGB; Distribution: /ILA([ACTION]) CMC([INFO-ONLY]) ; Sub-Collections: NIC; Clerk: FGB;

MIKE 20-MAR-75 08:03 32132

update of reviw of MRI Delphi on Solar Energy

this is a retransmit of something I sent earlier, but may have been undelivered.

MIKE 20-MAR-75 08:03 32132

update of reviw of MRI Delphi on Solar Energy

I have lsted here my initial observations regarding the MRI first questionnaire in the solar electric energy Technology Assessment conducted for the OTA. 1

The questionnaire covers a broad range of subjects; it is natural to expect that the respondents would possess a similarly broad range of expertise. I think this assumption is open to question. In particular, I doubt whether those respondents who can capably answer Section B, on Long-Term Socio-Economic trends could also answer (with equal authority) the questions on the average wholesale price of bituminous coal "(in dollars per ton)". The use of a self-rating feature would be appropriate here, to a certain degree, but I think an even better approach in this particular example would be to eliminate the questions on Long-Term Socio-Economic trends, and replace them with a scenario of the trends. Give the respondents a picture of the future environment of their forecasts. 2

"The time frame under consideration is about 50 years."

W O W !

3

"This assessment is evoted to a particular technology which has long range implications ...." Actually, as you read the introductory papers which preceded the questonnaire, you realize that the particular technoloy is not yet identified; this is part of the role of the respondents. 4

The use of graphs to indicate trends is terrific. I have advocated this for a long time, especially in the Canadian Government's Delpi on the future of tourism in Canada, but to now avail. Here it is implemented, and implemented well. Would the use of semi-log paper have been more appropriate for most of the data ? (Or would this have confused some of the respondents....probably not, if they are familiar with the trnds under consideration.) There is the obvious possiblity here of doing some consistency rating for the individual responsents (as Institute for the Future has done in the past). By changing the scales, or asking for a trend in one case and a value in a separate question, the researcher is able to determine the relative consistency of his respondents. A respondendent who is guessing off the top of his head will likely not be consistent. (Obvious liability here is that you upset the respondents who are internally consistent; "You already asked me this question !" 5

The use of comments is a welcome addition to studies using methodologies similar to the Delphi technique. (The term "Delphi"

was never used in any of supporting literature for this questionnaire,) I like the fact that the comments space appears right beside the questions being asked, rather than buried below a number of questions, but this may be because I like to set up my own questionnaires this way. I wish that the comments space had been larger for each question. True, the back of the page and margins are available to respondents, but they do not come naturally. I would have turned the paper on its side, included only two "items" per page, at the expense of adding pages to an already hefty document. (Although it sould be remembered that not many questions are asked,) 6

The section on Sources of Energy in the U.S. is the weakest point in the whole questionnaire. The graphic aids are appreciatd, but they don't relate to the numbers that respondents are asked to fill in. Asing respondents to fill in ten percentage-contributions for each of four time-frames amounts to considerably more than a first-look-approach of forty questions. I believe the amount of work involved for the respondents is closer to four times ten factorial (4 x 10!) I've never attempted questions with more than five "fill-in-the-percentages-to-total-to-100%-type elements. 7

The demographics section looks good; it contains the expert-self-rating feature mentioned above. 8

I noticed that the questions do not have mutually exclusive answers, that is there are two item 5's. This may present a problem for coding. I lke to put the qestion number right next to where I expect the respondent's answer to show up, and to keep the question numbers distinct. 9

I assume that the address on the cover of the questonnaire is the one where the respondent is supposed to send the questionnaire. If not, they should have made a point of including the address in the questionnaire itself, not confining it to a letter of transmittal or such. 10

I liked the questionnaire, and if the other questionnaires follow in its vein, then I may be mistaken about the lack of direction or planning revealed in the other study documents that accompanied the questionnaire. 11

The fact that the researcher has gone to the trouble of plotting the trends-to-date for each trend will be much appreciated by the respondents, and will make their responses more valuable. 12

MIKE 20-MAR-75 08:03 32132

update of reviw of MRI Delphi on Solar Energy

(J32132) 20-MAR-75 08:03;;;; Title: Author(s): Michael T. Bedford/MIKE; Distribution: /LHD([INFO-ONLY]) ; Sub-Collections: NIC; Clerk: MIKE;

SGR 20-MAR-75 09:39 32134

Miscellaneous Training stuff

I received (25592,) in response to a problem you reported with attendance at training clases. Would beinterestedin hearing w4at the problem was. The file (roetter,record,) is ready for your perusal. I also have a copy of the users file in my dr. I'm going to try to add what I did at ARPA this weeK and then you can take it over. Feel free to add stuff about SRI and NSW any time you have time. I'll try to keep it updated! Also sometime give me an estimate of how much time it will take to finish the command branch you've started for the ARPA orders (or whatever the first one was for). Susan 1

SGR 20-MAR-75 09:39 32134

Miscellaneous Training stuff

(J32134) 20-MAR-75 09:39;;;; Title: Author(s): Susan Gail Roetter/SGR; Distribution: /JMB([ACTION]) ; Sub-Collections: SRI-ARC; Clerk: SGR;

Attendence List of Navy Briefing

The following is a list of individials of the Computer Sciences Branch that attended the briefing SGR gave Tuesday, March 18, 1975 to members of NELC and NUC, Point Lomos. 1

Clemot J. Van Vliet, Mathematician, Software Applications/Communication Systems 2

Frank Miller, Computer Specialist, Software Applications/Communication Systems 3

Janet McDonald, Mathematician, Software Applications/Communication Systems 4

Dennis Squier, Computer Specialist, Software Applications/Communication Systems 5

Steve Fickas, Computer Specialist, Systems/Advanced Software 6

L.J. (Bud) Ronner, Operations Manager, Business Systems 7

M. Vineberg, E.E., Systems/Advanced Software 8

Tricia Santoni, Computer Programmer, Systems/Advanced Software 9

Virginia Martin, Computer Technician, Services 10

Lin Sutton, Computer Specialist, Software Applications/Communication Systems 11

RH 20-MAR-75 11:31 32135

Attendence List of Navy Briefing

(J32135) 20-MAR-75 11:31;;;; Title: Author(s): Rita Hysmith/RH;
Distribution: /SGR([ACTION]) RLL([INFO-ONLY]) JCN([INFO-ONLY]
) DEC([INFO-ONLY]) JMB([INFO-ONLY]) ; Sub-Collections: SRI-ARC
DEC; Clerk: RH; Origin: < HYSMITH, ALIST,NLS;2, >, 20-MAR-75
11:26 RH ;;;;####;

JVW 20-MAR-75 12:01 32136

Here, There, EveryWhere

To lead a bwetter life, I need my love to be here, Here, making each day of the year,Enough said, Dont you all wish this day and tomarrow would be over, so we could have a nice weekend. 1

Here, There, Everywhere

(J32136) 20-MAR-75 12:01;;;; Title: Author(s): Josephine V. Wagner/JVW; Distribution: /SHR([INFO-ONLY]) PAG([INFO-ONLY]) CFP([INFO-ONLY]) JVW([INFO-ONLY]) ; Sub-Collections: NIC; Clerk: JVW;

Suggestions for the next version of the Basic and Second Courses

After my last training trip and extensive use of both the basic and second course I have the following suggestions to make for the next version of both courses. 1

Basic Course 2

In the section on basic TNLS I think the definition of OK should be removed and put in the definitions for course outline section. (p.s. just noticed that OK was in the list of definitions for the course outline in the second course - same thing would be great in the basic course) Also, the show directory command needs three CR's, only 2 are shown. 2a

To the description of linking in Tenex, add a description of how to break links. 2b

Also, I received some complaints about how much skipping around was done, so I changed in later courses and essentially ignored the (2)'s and went through the basic course sequentially with the exception of the insert text command. It seemed to work better (except people wondered what the (2)'s were!) and made me wonder if the (2)'s are really necessary or if the document might not look better without them - and work more smoothly too. 2c

Second Course 3

In the definitions for the course outline add an * beside the definitions for [ ], <esc>, and CM. 3a

In the login section, in the description of elog, add a space <> after EL. 3b

In the printing section add an * to the description of LF and add the Set Viewspecs command. 3c

In the addressing section remove the * from the description of +e. 3d

In the Communicating section, the syntax for the Group command should include --(through) SOURCE or some such thing. In the section on Interrogate, Group should be added as a potential type of source. The Show Record command doesn't show that you have to first type a space and that you have to also type the H. 3e

In the Trouble shooting section, the Show Disk command needs another space before Disk. 3f

Also, and finally, I think it might be better to move the editing section to follow the file section so that when you have defined the words branch and group you could move into an explanation of

how the editing commands use those words. I don't think it would be any trouble to leave the printing and addressing until after the editing. In fact I did try it in this order once and thought it worked well. All the above suggestions were mainly editing things - this is a little more major so you might want to wait and see what Jeanne has to say too. 3g

Suggestions for the next version of the Basic and Second Courses

(J32137) 20-MAR-75 12:12;;;; Title: Author(s): Susan Gail Roetter/SGR; Distribution: /JHB([ACTION]) JMB([INFO-ONLY]) RH([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: SGR; Origin: < ROETTER, BLAP,NLS;1, >, 20-MAR-75 12:09 SGR ;;;;####;

CFP 20-MAR-75 12:17 32138

Thursday afternoon, March 20, 1975, 2:15 p.m.

The weather is really beautiful today and we should all go outside. Something is wrong with this line and Im having problems with printing anything. 1

Thursday afternoon, March 20, 1975, 2:15 p.m.

(J32138) 20-MAR-75 12:17;;;; Title: Author(s): Cynthia F. Pattillo/CFP; Distribution: /PWF2([INFO-ONLY]) JVW([INFO-ONLY]) SHR([INFO-ONLY]) PAG([INFO-ONLY]) ; Sub-Collections: NIC; Clerk: JVW;

school days

RMW 20-MAR-75 12:29 32139

school days

(J32139) 20-MAR-75 12:29;;;; Title: Author(s): Ruth M. Woodley/RMW;
Distribution: /PAG([INFO-ONLY]) JMB([INFO-ONLY]) ;
Sub-Collections: NIC; Clerk: RMW; Origin: < DSDC-SC, RMW,NLS;1,
>, 19-MAR-75 08:16 JMB ;;;;####;

uhlir is sending

The date is 19 Mar 75. We are in SY for a class, I dont know about anybody else, but I am totally confused. 1

The date today is 20 Mar 75, and we are in class again. I would like to fix this file so it will make a little more sense. 2

SUBJECT: Request for Amendment to ARPA Order 9999 3

My name is Cindy. 4

Your name is Jo. We work in PR. This is Wednesday afternoon, and we just returned from lunch. 5

JVW 20-MAR-75 12:30 32140

uhlir is sending

(J32140) 20-MAR-75 12:30;;;; Title: Author(s): Josephine V. Wagner/JVW; Distribution: /PWF2([ACTION]) ; Sub-Collections: NIC; Clerk: JVW; Origin: < DSDC-PR, OLDMAN.NLS;2, >, 19-MAR-75 12:30
CFP ;;;;####;

Memo

< BECK, JMB,NLS;57, >, 19-MAR-75 05:28 JMB ;;;;preassigned numbers:
24833 1

JMB 20-MAR-75 12:36 32141

Memo

(J32141) 20-MAR-75 12:36;;;; Title: Author(s): Jeanne M. Beck/JMB;
Distribution: /CFP([ACTION]) SHR([ACTION]) JMB([INFO-ONLY])
; Sub-Collections: SRI-ARC; Clerk: JMB;

school days

RMW 20-MAR-75 12:40 32142

school days

(J32142) 20-MAR-75 12:40;;;; Title: Author(s): Ruth M. Woodley/RMW;
Distribution: /PAG([INFO-ONLY]) CFP([INFO-ONLY]) JVW([
INFO-ONLY]) SHR([INFO-ONLY]) JMB([INFO-ONLY]) ;
Sub-Collections: NIC; Clerk: RMW; Origin: < DSDC-SC, RMW,NLS;1,
>, 19-MAR-75 08:16 JMB ;;;;####;

JMB 20-MAR-75 12:44 32143

Memo

director of medical systems 1

date: 19 march 1975 2

summary of requirements: two crt's, 1 high speed printer, and 3 minicomputers with frontend processors, 3

now is the time for all good men to come to the aid of their country. 4

JMB 20-MAR-75 12:44 32143

Memo

(J32143) 20-MAR-75 12:44;;;; Title: Author(s): Jeanne M. Beck/JMB;
Distribution: /CFP([ACTION]) SHR([ACTION]) JMB([INFO-ONLY])
; Sub-Collections: SRI-ARC; Clerk: JMB; Origin: < DSDC-SG,
CONCEPTS,NLS;2, >, 19-MAR-75 12:30 PAG ;;;;####;

texas instruments

texas instruments

(J32144) 20-MAR-75 12:48;;;; Title: Author(s): Ruth M. Woodley/RMW;
Distribution: /CFP([INFO-ONLY]) JVW([INFO-ONLY]) JMB([
INFO-ONLY]) SHR([INFO-ONLY]) ; Sub-Collections: NIC; Clerk: RMW;
Origin: < DSDC-SC, RMW,NLS;1, >, 19-MAR-75 08:16 JMB ;;;;####;

JGN 20-MAR-75 16:00 32146

NAVY NET

DEAR BETTY, 1

I HEARD THAT YOU WERE TRYING TO REACH ME REGARDING BEING PART OF THE EXPERIMENTAL NAVY NETWORK, AND THAT YOU WERE INTERESTED FROM THE POINT OF VIEW OF OUR SYSTEM ARCHITECTURE DESIGN AND EVALUATION FACILITY, WHAT'S UP?? ALSO, HOW DID YOUR MEETING GO LAST WEEK? 2

I CAN BE REACHED VIA SNDMSG NELC@ISI. 3

DANA (AS DICTATED TO GREG NOEL) 4

NAVY NET

(J32146) 20-MAR-75 16:00;;;; Title: Author(s): J. G. Noel/JGN;
Distribution: /EHC([ACTION]) ; Sub-Collections: NIC; Clerk: JGN;
Origin: < NAVIMP, DANATOBETTY.NLS;1, >, 20-MAR-75 15:50 JGN ;;;;####;

TIME CARD

JOAN, SORRY FOR THE ACCOUNTING HASSLE. JIM NORTON SAID HE HAD NOTIFIED THEM, BUT I DONT KNOW. I SENT HIM A MESSAGE ASKING HIM TO BE SURE TO GET IT STRAIGHT WITH THEM (TODAY) SO THAT THEY WOULD STOP BUGGING YOU ABOUT IT. IF THEY DO AGAIN JUST TELL THEM TO CALL HIM.
MARCIA

1

TIME CARD

(J32147) 20-MAR-75 18:17; Title: Author(s): Marcia Lynn Keeney/MLK;
Distribution: /JOAN; Sub-Collections: SRI-ARC; Clerk: MLK;

DLS 19-MAR-75 13:25 32148

PDP-10X Buy, AF30602-72-C-0313

Procurement paperwork, I'm Journaling for the record,,,need the space

PDP-10X Buy, AF30602-72-C-0313

(eval) 1

RADC/ISIM (D. Stone/X3857) 20 MAR 75 1a

Technical Evaluation of SRI Proposal, ISU 74-127; in Response to PR B-5-3248 & PR B-5-3249, PDP TENEX Purchase and Operation 1b

RADC/ISIM
ISI
ISM
PMRB/Mr. DeLorenzo
IN TURN 1c

1. The subject proposal has been evaluated in accordance with the established evaluation criteria, ref attached AFSC-65 and the attached ARPA Order No. 2853. 1d

2. The proposal from Stanford Research Institute (SRI) is acceptable for this procurement. SRI has demonstrated their competence in operating and maintaining a complex non-standard PDP-10X facility connected to the ARPANET over the past 3 years. SRI has complied with the requirements of the work statement. 1e

3. It is recommended that award be made to SRI, who is uniquely qualified to accomplish this effort, ref attached ARPA Memorandum for record, Selected Source Justification. 1f

4. It is recommended that any contract resulting with SRI be dated 1 JUL 74 and that SRI be allowed to submit charges from that date. SRI has kept the subject PDP-10X facility operational and it has been used by ARPA and ARPA contractors over the ARPANET since 1 JUL 74. If SRI had returned the facility to Digital Equipment Corp., and it had to be later installed again at SRI, the total cost would have significantly increased; as well as have caused serious interuptions in ARPA efforts. 1g

DUANE L. STONE 3 Attchs: SRI Tech Prop 1h

ARPA Order 1i

ARPA Memo 1j

Information Management Sciences Section 1k

Information Processing Branch 11

(prop) 2

(norton,arpaprop-rem,1:w) 2a

(sow) 3

B-5-B-5-3249 & B-5-3248
PDP TENEX PURCHASE and OPERATION

RESEARCH AND TECHNOLOGY WORKSTATEMENT 3a

OBJECTIVE: 3b

The objectives of this effort are to procure the PDP-10X facility currently leased by Augmentation Research Center (ARC) at Stanford Research Institute (SRI), to operate and maintain it for a six month period (primarily in support of the ARPA National Software Works (NSW) project) and to transfer it and associated equipment to Systems Control Inc. (SCI) for subsequent relocation to the ARPA research center, Moffett Field, CA. 3b1

SCOPE: 3c

N/A 3c1

BACKGROUND: 3d

A PDP-10X facility has been leased from Digital Equipment Corp. under contracts F30602-70-C-0219 and F30602-72-C-0313 to support the development of augmentation systems and to provide an information service to the ARPANET. Additional equipment was purchased. The ARC was highly successful in their development efforts and under contract F30602-74-C-0076 have established their software system on a commercially operated facility attached to the ARPANET (Office-1). The project team at ARC is being redirected by ARPA and RADC to support the NSW project. A complete PDP-10X facility is no longer required by the ARC development team's role in the NSW project. After 1 Jan 75 the ARC development team will obtain their necessary computer time from Office-1. 3d1

The Tactical Technology Office at ARPA has a project that requires a dedicated PDP-10X facility. Since the facility at ARC has been leased for 4 years, a substantial savings in the purchase cost can be realized. 3d2

TASKS/TECHNICAL REQUIREMENTS: 3e

The contractor shall purchase the following equipment currently leased from DEC: 3e1

1 ea.	KA10	Arithmetic Processor	3e1a
1 ea.	KM10	Fast Register	3e1b
1 ea.	KT10A	Dual Mem Protect Relocate	3e1c

1 ea,	TM10A	Mag Tape Control	3e1d
1 ea,	TD10	DECTape Control	3e1e
1 ea,	DC10A	Data Line Scanner Control	3e1f
2 ea,	TU30-B	7-Channel Mag Tape	3e1g
2 ea,	TU55	DECTape Transport	3e1h
1 ea,	DC10B	8-Line Group Unit	3e1i
8 ea,	MA10	Core Memory	3e1j
2 ea,	ME10	Core Memory	3e1k
40 ea,	MC10	Memory Ports	3e1l
2 ea,	DF10	Data Channel	3e1m
1 ea,	RP10	Disk Controller	3e1n
1 ea,	RP10C	Disk Controller	3e1o
6 ea,	RP02	Disk	3e1p

The contractor shall make the above equipment and the following government owned equipment available to SCI on 1 Jan 75. It will be the responsibility of SCI to effect the transfer of the equipment to their facility. 3e2

1 ea,	BBN Pager	3e2a
1 ea,	BBN ARPANET interface	3e2b
1 ea,	Bryant Model 1851024 Autolift Drum	3e2c

The contractor shall operate and maintain all of the above equipment, plus other government owned equipment acquired under contract F30602-72-C-0313. The facility, running the oN Line System (NLS) and FORTRAN, shall be available via the ARPANET 24 hours a day, 7 days a week, minus the necessary DEC maintenance time. Daily access to the facility will be governed by the currently resident group allocation system. The number of groups, the number of slots per group and the individuals in each group will be determined by ARPA. 3e3

DATA REQUIREMENTS: 3f

Due to the nature of this effort no formal documentation will be required. The contractor should use NLS facilities to summarize and notify each group of its system use on a weekly basis. 3f1

(pr) 4

2. Objective 4a

The objectives of this effort are to procure the PDP-10X facility currently leased by Augmentation Research Center (ARC) at Stanford Research Institute (SRI), to operate and maintain it for a six month period (primarily in support of the ARPA National Software Works (NSW) project) and to deliver it and associated equipment to Systems Control Inc. (SCI). 4a1

3. Follow-on funding 4b

N/A TPO 11 4b1

6. Coor req. 4c

yes---ARPA 4c1

7. Resour. req 4d

no 4d1

8. RC/CC 4e

12. Term of contract 4f

6 mo. 4f1

14. Unsol. Prop 4g

N/A 4g1

15. Sole Source Company 4h

SRI 4h1

16. Contract num. 4i

N/A 4i1

17. Job order num 4j

55500811 4j1

18, Accession num, 4k

727100 4k1

20, Type buy 4l

B 4l1

21, Buying agency 4m

1 4m1

22, Title 4n

PDP TENEX Purchase and Operatione 4n1

24, BPAC 4o

28535F-10 4o1

25, PEC 4p

62706E 63728F 4p1

26, Fund User 4q

ARPA 4q1

27, Lead Div 4r

IS 4r1

28, Proj 4s

2853 5550 4s1

29, Task 4t

01 08 4t1

30, Line no 4u

01 01 4u1

31, Source 4v

B-5-B-5-3249 & B-5-3248
PDP TENEX PURCHASE and OPERATION

ARPA AFSC 4v1

32, Funds 4w

$415,182 $135,000 4w1

33, PR num 4x

B-5-3249 B-5-3248 4x1

34, Change 4y

(memos) 5

DLS 3-JUL-74 09:05 30912
Suport of operation of ARC PDP-10X for 6 mo,
Location: (MJOURNAL, 30912, 1:w)
*****Note: Author Copy***** 5a

Comments: Memo signed by Col Krutz 2 JUL 74 5a1

(dialog) 6

Dave,..a couple of questions,..will the ARPA order be #2853, does SCI stand for Systems Control Inc, is the following a reasonably good workstatement??? It has some NSW flavor, since this is the local reason for adding money to the effort, We will also need approval from the senior ARPA ADPE official (Mr, Beard I am told) to buy this particular set of equipment, I am looking into what that involves now, Do you have an anticipated date for ARPA order release? 6a

15 JUl 74,..Talked with Jane in procurement, She says that a Mr, Beard at ARPA is the senior ADPE officer, A TWX from him is the only valid approval for ADPE buys, He will have to check with Cameron Station, via a form, to make sure that the desired equipment is not available elsewhere, She has the instructions and examples of the form etc,..will pick up copy from her, 6b

10 JUL 74 received call from Jack R,..says that ARPA order is still in ARPA, MIPR will be for $415,182, This leaves $134,657 for us to pick up, Order number is 2853, BPAC = 5F10/2853, PEC = 62706E, The effort will have to be coordinated through some ADPE channels,..probably best to go through ARPA's, Jane Trzepacz

(X2317) in procurement knows the format, and Ed Kobesky...if these can't get it for me, see Jack. 6c

PDP-10X Buy, AF30602-72-C-0313

(J32148) 19-MAR-75 13:25;;;; Title: Author(s): Duane L. Stone/DLS;
Distribution: /ELF([INFO-ONLY]) ; Sub-Collections: RADC; Clerk:
DLS;

SMT 19-MAR-75 14:21 32149

The BRL Line Processor Arrival/Operation...!!!

To Martin, and all others on the distribution.....
The Line Processor equipment arrived yesterday (3/18). We have been operating through ANTS MARK I very satisfactorily, except for one problem. It has to do with the "up-arrow" as used by the ANTS system..., when we use it---while connected through to OFFICE, and into DNLS, puts the Line Processor into 'nervous prostration' ---it requires a 're-set', but more than that we find ourselves back in TENEX, with the apparent necessity of informing TENEX that we are a Line Processor.... How about that? !!!! What is happening? Does the Line Processor need the 'up-arrow' for something? If so, we can always change the ANTS character, with ease! Also, for a period this pm, the command interpreter was acting 'queer', Text was being entered at the top of the 'top' window, and nothing would happen in the usual 'place' within the top window until I hit the CA. Can you explain this 'funny'? Also where are the documents on the DATAMEDIA?? That's 'nuf for today.... stan

1

SMT 19-MAR-75 14:21 32149

The BRL Line Processor Arrival/Operation...!!!

(J32149) 19-MAR-75 14:21;;;; Title: Author(s): Stan M. Taylor/SMT;
Distribution: /MEH([ACTION]) DCE([INFO-ONLY]) JCN([INFO-ONLY]
) JHB([INFO-ONLY]) SGR([INFO-ONLY]) ; Sub-Collections: NIC;
Clerk: SMT;

MIKE 19-MAR-75 15:06 32150

further notes on the MRI Solar Energy T.A. questionnaire

I'd say this is a pretty good evaluation of the questionnaire, and if I were to receive a similar evaluation of one of my questionnaires, I would be impressed that some outsider took such an interest in my work.

MIKE 19-MAR-75 15:06 32150

further notes on the MRI Solar Energy T.A. questionnaire

I have listed here my initial observations regarding the MRI first questionnaire in the solar electric energy Technology Assessment conducted for the OTA. 1

The questionnaire covers a broad range of subjects; it is natural to expect that the respondents would possess a similarly broad range of expertise. I think this assumption is open to question. In particular, I doubt whether those respondents who can capably answer Section B, on Long-Term Socio-Economic trends could also answer (with equal authority) the questions on the average wholesale price of bituminous coal "(in dollars per ton)". The use of a self-rating feature would be appropriate here, to a certain degree, but I think an even better approach in this particular example would be to eliminate the questions on Long-Term Socio-Economic trends, and replace them with a scenario of the trends. Give the respondents a picture of the future environment of their forecasts. 2

"The time frame under consideration is about 50 years."

W O W !

3

"This assessment is evoted to a particular technology which has long range implications ...." Actually, as you read the introductory papers which preceded the questonnaire, you realize that the particular technoloy is not yet identified; this is part of the role of the respondents. 4

The use of graphs to indicate trends is terrific. I have advocated this for a long time, especially in the Canadian Government's Delpi on the future of tourism in Canada, but to now avail. Here it is implemented, and implemented well. Would the use of semi-log paper have been more appropriate for most of the data ? (Or would this have confused some of the respondents....probably not, if they are familiar with the trnds under consideration.) There is the obvious possiblity here of doing some consistency rating for the individual responsents (as Institute for the Future has done in the past). By changing the scales, or asking for a trend in one case and a value in a separate question, the researcher is able to determine the relative consistency of his respondents. A respondendent who is guessing off the top of his head will likely not be consistent. (Obvious liability here is that you upset the respondents who are internally consistent; "You already asked me this question !" 5

The use of comments is a welcome addition to studies using methodologies similar to the Delphi technique. (The term "Delphi"

was never used in any of supporting literature for this questionnaire.) I like the fact that the comments space appears right beside the questions being asked, rather than buried below a number of questions, but this may be because I like to set up my own questionnaires this way. I wish that the comments space had been larger for each question. True, the back of the page and margins are available to respondents, but they do not come naturally. I would have turned the paper on its side, included only two "items" per page, at the expense of adding pages to an already hefty document. (Although it sould be remembered that not many questions are asked.) 6

The section on Sources of Energy in the U.S. is the weakest point in the whole questionnaire. The graphic aids are appreciatd, but they don't relate to the numbers that respondents are asked to fill in. Asing respondents to fill in ten percentage-contributions for each of four time-frames amounts to considerably more than a first-look-approach of forty questions. I believe the amount of work involved for the respondents is closer to four times ten factorial (4 x 10!) I've never attempted questions with more than five "fill-in-the-percentages-to-total-to-100%-type elements. 7

The demographics section looks good; it contains the expert-self-rating feature mentioned above. 8

I noticed that the questions do not have mutually exclusive answers, that is there are two item 5's. This may present a problem for coding. I lke to put the qestion number right next to where I expect the respondent's answer to show up, and to keep the question numbers distinct. 9

I assume that the address on the cover of the questonnaire is the one where the respondent is supposed to send the questionnaire. If not, they should have made a point of including the address in the questionnaire itself, not confining it to a letter of transmittal or such. 10

I liked the questionnaire, and if the other questionnaires follow in its vein, then I may be mistaken about the lack of direction or planning revealed in the other study documents that accompanied the questionnaire. 11

The fact that the researcher has gone to the trouble of plotting the trends-to-date for each trend will be much appreciated by the respondents, and will make their responses more valuable. 12

MIKE 19-MAR-75 15:06 32150

further notes on the MRI Solar Energy T.A. questionnaire

(J32150) 19-MAR-75 15:06;;;; Title: Author(s): Michael T. Bedford/MIKE; Distribution: /LHD([INFO-ONLY]) ; Sub-Collections: NIC; Clerk: MIKE;

JGN 19-MAR-75 15:20 32151

REQUEST FOR INFORMATION

CAN WE RUN ELF IN 64K OF A 128K MACHINE AND RUN AN INDEPENDENT PROCESS IN THE OTHER 64K? AN EXAMPLE OF AN INDEPENDENT PROCESS IS A CROSS-ASSEMBLER FOR A MICRO-PROCESSOR, WHICH WOULD REQUIRE ACCESS TO THE PDP-11'S DISK. YOU MAY NOT BE THE RIGHT PERSON TO ASK THIS, BUT IF NOT, COULD YOU EITHER FORWARD IT TO THE RIGHT PERSON OR TELL US WHO TO CONTACT? A REPLY SHOULD BE SENT TO NELC@ISI.

THANKS
DANA SMALL (DICTATED TO GREG NOEL) 1

JGN 19-MAR-75 15:20 32151

REQUEST FOR INFORMATION

(J32151) 19-MAR-75 15:20;;;; Title: Author(s): J. G. Noel/JGN;
Distribution: /DLR([ACTION]) JGN([INFO-ONLY]) FGB([INFO-ONLY]
) ; Sub-Collections: NIC; Clerk: JGN;

DAP 19-MAR-75 16:27 32152

Unfulfilled requests

refers back to requests made in 31986 and 31998.

DAP 19-MAR-75 16:27 32152

Unfulfilled requests

Some of my recent requests for changes in idents and in disk space allocations have apparently slipped through the cracks, to wit:

ETS (Educational Testing Service) remains Educational Testing Services. That last "s" has to go.

See journal 31986 (DAP 6-MAR-75 08:01) for three requested changes in disk space allocation, not one of which has been done. 1

Unfulfilled requests

(J32152) 19-MAR-75 16:27;;;; Title: Author(s): David A. Potter/DAP;
Distribution: /FEEDBACK([ACTION]) AMH([INFO-ONLY]) EJA2([
INFO-ONLY]) BVH([INFO-ONLY]) ; Sub-Collections: NIC FEEDBACK;
Clerk: DAP;

GAS2 19-MAR-75 16:46 32153

I have received your test message and all looks well, Thanks
...Glenn

1

(J32153) 19-MAR-75 16:46;;;; Title: Author(s): Glenn A. Sherwood/GAS2; Distribution: /FEEDBACK([ACTION]) KLM([INFO-ONLY]) ; Sub-Collections: NIC FEEDBACK; Clerk: GAS2;

PWO 19-MAR-75 17:32 32154

Meeting With John perry at National Academy of Science

PWO sent this to DvN as a sendmessage, he is taking the liberty of journalizing it.

Meeting With John Perry at National Academy of Science

19-MAR-75 1236-PDT O'KEEFE: meeting with John Perry
Distribution: VANNOUHUYS, o'keefe, mabrey
Received at: 19-MAR-75 12:36:24 1

Kathy, Tom and Norm may be interested in this, 1a

I called John Perry today to verify our Friday meeting and to determine whether that fellow from American University could make it. He indicated that that contact was probably not worth pursuing at this point due to somechanges taking place there now and the rather weak indication of interest they had shown. However he did have some interesting information. He had tried to arrangge for Richard Belknapp who heads NAS's printing and Publishing Office to attend our meeting but Friday morning the Committee from the Academy of Science that he heads up is scheduled to meet. This committee is responsible for their publishing operation so coincidentally, it is exactly the right group of persons gathered together at the right time. He asked if I would mind addressing the committee on our work and our concepts of an EPC. I agreed providing I could get together with hhim shorly before the meeting to identify their main interests and problems. I will let you know how it went next Monday since the meeting is on Friday. See you then. Pat, 1b

PWO 19-MAR-75 17:32 32154

Meeting With John Perry at National Academy of Science

(J32154) 19-MAR-75 17:32;;;; Title: Author(s): Pat Whiting
O'Keefe/PWO; Distribution: /JOAN([ACTION] dpcs notebook please) DCE(
[INFO-ONLY]) RLL([INFO-ONLY]) EKM([INFO-ONLY]) ;
Sub-Collections: SRI-ARC DPCS NIC; Clerk: DVN;

ILA 21-MAR-75 04:46 32155

Working on Alternative Networks

I have received comments on the Alternative Networks paper in regards to style and content. What I was hoping we could do is to try to use the network to work on the paper together. If anyone feels that something should be changed,then they can take the fileand modify it. I am transferrring it in the state when I sent the message to the NAVIMP directory from my own . It will becalled ALTERNATIVE-NETWORKS.NLS. Make changes to itand then update it and send us a message to read it and then we can make more changes to it. Rememberto update the file as then others can make changes to it. While each user is making changes others are locked out of making changes--Hopint to see some changessoon--Larry

1

ILA 21-MAR-75 04:46 32155

Working on Alternative Networks

(J32155) 21-MAR-75 04:46;;;; Title: Author(s): I. Larry Avrunin/ILA; Distribution: /NAVIMP([ACTION]) ; Sub-Collections: NIC NAVIMP; Clerk: ILA;

FGB 21-MAR-75 07:29 32156

NELC@ISI ? Is the mailbox there yet ?

Greg,
I passed your request on to Mjr. Carlstrom (CARLSTROM@ISI) who is fielding these kinds of questions for Dave Retz. However, A carbon of the message I sent him addressed to NELC@ISI didn't make it, I got message from mailer that "mailbox doesn't exist". Could you check & clarify pleease. Thanks. Frank

1

FGB 21-MAR-75 07:29 32156

NELC@ISI ? Is the mailbox there yet ?

(J32156) 21-MAR-75 07:29;;;; Title: Author(s): Frank G. Brignoli/FGB; Distribution: /JGN([ACTION]) ; Sub-Collections: NIC; Clerk: FGB;

NETWORK UNIX 1

RFC 681 NIC 32157 2

INTRODUCTION 3

THE UNIX TIME-SHARING SYSTEM [1] PRESENTS SEVERAL INTERESTING CAPABILITIES AS AN ARPA NETWORK MINI-HOST. IT OFFERS POWERFUL LOCAL PROCESSING FACILITIES IN TERMS OF USER PROGRAMS, SEVERAL COMPILERS, AN EDITOR BASED ON QED, A VERSATILE DOCUMENT PREPARATION SYSTEM, AND AN EFFICIENT FILE SYSTEM FEATURING SOPHISTICATED ACCESS CONTROL, MOUNTABLE AND DE-MOUNTABLE VOLUMES, AND A UNIFIED TREATMENT OF PERIPHERALS AS SPECIAL FILES. 3a

THE NETWORK CONTROL PROGRAM (NCP), IS INTEGRATED WITHIN THE UNIX FILE SYSTEM. NETWORK CONNECTIONS ARE TREATED AS SPECIAL FILES WHICH CAN BE ACCESSED THROUGH STANDARD UNIX I/O CALLS; VIZ. READ, WRITE, OPEN, CLOSE. SPECIAL FILES HAVE DIRECTORY ENTRIES SIMILAR TO NORMAL FILES EXCEPT THAT CERTAIN FLAG BITS ARE SET. THESE FLAG BITS CAUSE SYSTEM I/O ROUTINES TO TAKE SPECIAL ACTION. IN UNIX, SPECIAL FILES SIGNIFY PERIPHERAL DEVICES. FOR EXAMPLE, I/O TRANSACTION WITH MAGTAPE ZERO WOULD BE ACCOMPLISHED BY ACCESSING THE SPECIAL FILE, "/DEV/MT0". FOR THE UNIX NETWORK SYSTEM, ADDITIONAL SPECIAL FILES WERE CREATED EACH OF WHICH SPECIFIES A HOST ON THE ARPA NETWORK. FOR EXAMPLE "/DEV/NET/HARV" REPRESENTS THE PDP-10 AT HARVARD. THIS SIMPLE ACCESS MECHANISM, THROUGH THE FILING SYSTEM, ALLOWS STANDARD ARPA PROTOCOLS SUCH AS TELNET AND FTP TO BE IMPLEMENTED AS SWAPPABLE USER PROGRAMS, RESIDENT ONLY WHEN NEEDED. FURTHERMORE, A USER MAY WRITE HIS OWN PROGRAMS TO COMMUNICATE WITH THESE SPECIAL FILES JUST AS THE TELNET PROGRAM DOES. THE SAMPLE PROGRAM FOUND BELOW DEPICTS THE ESSENTIALS OF NETWORKING FROM UNIX. 3b

STANDARD I/O 4

TO PRESENT THE BASIC PROPERTIES OF UNIX I/O, THE READ, WRITE, OPEN, AND CLOSE FUNCTION CALLS ARE SUMMARIZED BELOW. EACH CALL MAY RESULT IN AN ERROR CODE OF MINUS ONE. 4a

TO MANIPULATE AN EXISTING FILE WITH READS OR WRITES, IT MUST FIRST BE OPENED WITH THE FOLLOWING CALL: 4b

```
FILEDES = OPEN( "ANYFILENAME",FLAG )
```

4b1

WHERE "ANYFILENAME" IS THE ARBITRARY NAME OF THE FILE TO BE OPENED. THE SECOND PARAMETER INDICATES WHETHER THE FILE IS TO BE READ, WRITTEN, OR UPDATED. THE RETURNED VALUE "FILEDES", IS CALLED A FILE DESCRIPTOR. IT IS AN INTEGER USED TO IDENTIFY THE FILE IN SUBSEQUENT CALLS TO READ AND WRITE.

4c

ONCE A FILE HAS BEEN OPENED, THE FOLLOWING CALLS MAY BE USED:

4d

```
NBYTES = READ( FILEDES,BUFFER,COUNT );
NBYTES = WRITE( FILEDES,BUFFER,COUNT );
```

4d1

COUNT IS THE NUMBER OF BYTES TO BE TRANSMITTED BETWEEN THE FILE REPRESENTED BY 'FILEDES' AND THE BYTE ARRAY REPRESENTED BY 'BUFFER'. NBYTES IS THE NUMBER ACTUALLY TRANSMITTED. FOR THE READ CALL, 'NBYTES' MAY BE ZERO TO INDICATE THE END OF FILE; IN EITHER CASE, MINUS ONE WILL BE RETURNED IF THERE WAS AN ERROR.

4e

FOR EACH OPEN FILE, THE SYSTEM MAINTAINS A POINTER TO THE NEXT BYTE TO BE READ OR WRITTEN. IF N BYTES ARE TRANSMITTED, THE POINTER ADVANCES N BYTES. DATA WRITTEN TO A FILE AFFECT ONLY THOSE BYTES IN THE FILE WHICH ARE INDICATED BY THE POSITION OF THE WRITE POINTER AND THE COUNT; NO OTHER PART OF THE FILE IS CHANGED. IF THE SYSTEM POINTER INDICATES THAT ANY BYTES BEING WRITTEN WOULD LIE BEYOND THE END OF THE FILE, THE FILE IS ENLARGED AS NEEDED.

4f

ONCE THE USER HAS FINISHED PROCESSING A FILE, IT SHOULD BE CLOSED. THIS IS AFFECTED WITH THE FOLLOWING CALL:

4g

```
CLOSE( FILEDES );
```

4g1

ALTHOUGH IT IS NOT ABSOLUTELY NECESSARY TO DO A SPECIFIC CLOSE ON A FILE WHEN FINISHED, (THE SYSTEM CLOSES ALL FILES WHEN A PROGRAM EXITS), IT IS A GOOD PRACTICE, SINCE THE USER IS ALLOWED ONLY SIXTEEN OPEN FILES.

4h

THERE ARE SEVERAL ADDITIONAL SYSTEM CALLS RELATED TO I/O WHICH WILL NOT BE DISCUSSED IN DETAIL. A FEW OF THE MORE NOTABLE ONES ALLOW THE USER TO: GET THE STATUS OF A FILE, CHANGE THE PROTECTION OR OWNERSHIP OF A FILE, CREATE A FILE, CREATE A DIRECTORY, MAKE A LINK TO AN EXISTING FILE, AND DELETE A

FILE. FOR FURTHER INFORMATION CONCERNING THE DIFFERENT I/O CALLS THE READER IS DIRECTED TO THE UNIX PROGRAMMER'S MANUAL, FIFTH EDITION, K. THOMPSON, AND D. M. RITCHIE, JUNE 1974. 4i

THE USER COMMUNICATES WITH THE NETWORK VIA THESE SAME SYSTEM CALLS. FOR EXAMPLE, IF ONE WISHED TO CONNECT TO THE THE PDP-10 AT HARVARD, THE FOLLOWING SEQUENCE OF CALLS MIGHT BE USED. 4j

```
FILEDES = OPEN( "/DEV/NET/HARV",2 );
IF( FILEDES < 0 )
   PRINTF(" HARVARD IS DEAD");
ELSE
   WHILE( (NBYTES=READ(FILEDES,BUF,80)) > 0 )
      WRITE( 0,BUF,NBYTES );
```
4j1

THE OPEN INSTRUCTS THE SYSTEM TO OPEN A TELNET CONNECTION TO HARVARD, IF MINUS ONE IS RETURNED, THE PROGRAM PRINTS A MESSAGE AND EXITS, OTHERWISE THE PROGRAM WILL READ ANY BYTES SENT BY HARVARD AND PRINT THEM OUT ON THE CONTROLLING TELETYPE. THIS WILL GO ON UNTIL HARVARD CLOSES THE CONNECTION (READ WILL RETURN MINUS ONE WHEN THE CONNECTION IS CLOSED). 4k

UNIX TELNET 5

IN ORDER TO COMMUNICATE WITH REMOTE HOSTS ON THE ARPA NETWORK, ONE FIRST LOGS IN TO UNIX AS A NORMAL USER. THE USER THEN RUNS A PROGRAM, TELNET, WHICH AFTER ANNOUNCING ITSELF LEAVES HIM WITH SEVERAL OPTIONS. 5a

HE MAY CONTINUE WITH HIS NORMAL UNIX ACTIVITIES. WHEN TELNET SEES A UNIX COMMAND, IT WILL INITIATE THE REQUEST AS A PARALLEL TASK, IN THE SAME MANNER AS THE UNIX COMMAND PROCESSOR (THE SHELL). SINCE THIS MAY BE DONE REGARDLESS OF WHETHER OR NOT A NETWORK CONNECTION IS OPEN, THE USER MAY SIMULTANEOUSLY RECEIVE OUTPUT FROM A FOREIGN HOST'S SERVER TELNET AND CONVERSE WITH THE LOCAL UNIX SYSTEM. 5b

WHEN THE TELNET-USER OPENS A CONNECTION, TELNET ACCEPTS THE HOST NAME AND ANY SPECIAL PARAMETERS, AND DOES AN OPEN ON THE SPECIAL FILE CORRESPONDING TO THAT HOST. WHEN CONTROL IS RETURNED, THE CONNECTION IS OPEN. ANY FURTHER DATA RECEIVED FROM THE TERMINAL NOT CONTAINING ESCAPE CHARACTER IS SENT TO THE

NETWORK FILE. ANY DATA RECEIVED IN RESPONSE TO A READ ON THE NETWORK FILE, IS WRITTEN ON THE USER'S TYPEWRITER. 5c

COMMUNICATION CONTINUES WITH THE HOST UNTIL THE USER WISHES TO CLOSE THE CONNECTION. THE USER SIMPLY MAKES THIS KNOWN TO TELNET VIA A COMMAND, AND TELNET DOES A STANDARD CLOSE ON THE NETWORK FILE. THE NEGOTIATION OF CLOSING THE NETWORK CONNECTION IS LEFT TO THE SYSTEM, FREEING THE USER FOR OTHER COMPUTATIONAL WORK. 5d

THERE IS SOME CHARACTER TRANSLATION AND INVISIBLE CONTROL INFORMATION PASSED BACK AND FORTH BETWEEN THE FOREIGN HOST AND THE TELNET PROCESS. THIS INVOLVES RECOGNITION OF TELNET IACS AND THE TRANSLATION OF CARRIAGE RETURN(CR) AND LINE FEED(LF) TO LINE FEED ON ALL DATA RECEIVED FROM THE NETWORK, AND THE INVERSE TRANSLATION OF LF TO CR LF ON ALL DATA SENT TO THE NETWORK. 5e

NCP STRUCTURE 6

DUE TO THE STRUCTURE OF BOTH THE IMP TO HOST[2] AND HOST TO HOST[3] NETWORK PROTOCOLS, DATA COMES FROM THE NETWORK DESTINED NOT ONLY FOR ONE OF MANY ACTIVE PROCESSES, BUT FOR THE INFORMATION OF THE LOCAL HOST AS A WHOLE. FOR EXAMPLE, NETWORK TRAFFIC SUCH AS A HOST TO HOST RESET, WHICH GENERALLY SIGNALS THAT A FOREIGN HOST HAS COME "ALIVE" MUST BE ACKNOWLEDGED TO LET THAT HOST KNOW THAT THE LOCAL HOST ITSELF IS "ALIVE". THEREFORE, THE LOCAL HOST MUST MONITOR DATA COMING FROM THE NET TO PERFORM NOT ONLY A MESSAGE SWITCHING FUNCTION, WHICH IS THE BULK OF NETWORK TRAFFIC, BUT TO PROVIDE A CONTROL AND STATUS FUNCTION. 6a

FURTHER, WHEN A PERSON ASSOCIATED WITH THE LOCAL HOST WISHES TO CARRY ON A CONVERSATION WITH A NETWORK SERVER, THE INITIAL CONNECTION PROTOCOL[4] MUST BE USED TO PROVIDE A LOGICAL PORT AT EACH SITE FOR SUCCEEDING INFORMATION FLOW. 6b

EXPERIENCE WITH THE ANTS MARK I[5] AND ANTS MARK II[6] SYSTEMS HAS SHOWN THAT THE ABOVE CLASSES OF NETWORK EVENTS ARE RELATIVELY INFREQUENT, AND THAT MOST NETWORK TRAFFIC IS IN TERMS OF USER DATA FLOW AND THE ASSOCIATED FLOW CONTROL(HOST TO HOST ALLOCATES AND IMP TO HOST RFNMS). IT IS ALSO THE CASE THAT THE SOFTWARE REQUIRED TO IMPLEMENT THE STATUS AND CONTROL FUNCTION IS THE BULKIEST PART OF AN NCP. 6c

IN UNIX, THE KERNEL OF THE OPERATING SYSTEM IS CORERESIDENT AND NON-SWAPPABLE. A LARGE KERNEL REDUCES THE MEMORY AVAILABLE FOR USER PROGRAMS. THUS IT IS DESIRABLE TO MINIMIZE THE AMOUNT OF CODE ADDED TO THE BASIC UNIX KERNEL FOR THE NCP. FOR THIS REASON, THE NCP IS IMPLEMENTED IN TWO PARTS. ONE PART IS ROOTED IN THE KERNEL AND MAKES UP THE NON-SWAPPABLE SECTION, ABOUT 3.5K WORDS OF CORE. THE OTHER SECTION (CALLED THE NCP DAEMON) DEALS WITH USER REQUESTS TO OPEN AND CLOSE CONNECTIONS AND HANDLES THE STATUS TRAFFIC DESCRIBED ABOVE. THE NCP DAEMON RUNS AS A SWAPPABLE USER PROCESS OF ABOUT 8.5K WORDS IN SIZE, AND COMMUNICATES WITH THE KERNEL VIA A SPECIAL FILE. 6d

HARDWARE AND SOFTWARE REQUIREMENTS 7

THE NETWORK SOFTWARE FOR UNIX WAS DEVELOPED ON A PDP-11/50, WITH MEMORY MANAGEMENT, TWO RK05 DISK PACKS, TWO NINE TRACK MAGTAPE DRIVES, FOUR DECTAPE DRIVES, 32K WORDS OF CORE, AND THREE TERMINALS. PRESENTLY THIS HAS BEEN EXPANDED TO ENCOMPASS A DH11 TERMINAL MULTIPLEXOR, AN RP03 MOVING HEAD DISK, A TWIN PLATTER RF11 FIXED HEAD DISK, FLOATING POINT, AND 48K OF CORE. USER FILES ARE STORED ON THE RP03, THE RF11 IS USED AS A SWAP DISK AND FOR TEMPORARY FILE STORAGE; ONE RK05 PLATTER CONTAINS THE SYSTEM FILES, AND THE SECOND CONTAINS LOGIN AND ACCOUNTING INFORMATION. IN THE NEAR FUTURE, THE SYSTEM WILL BE EXPANDED TO 128K WORDS OF CORE MEMORY WITH 10 DIAL IN AND 10 HARD WIRED TERMINAL LINES. 7a

THE BASE OPERATING SYSTEM OCCUPIES 24.5K WORDS OF MEMORY. THIS SYSTEM INCLUDES A LARGE NUMBER OF DEVICE DRIVERS, AND ENJOYS A GENEROUS AMOUNT OF SPACE FOR I/O BUFFERS AND SYSTEM TABLES. A MINIMAL SYSTEM WOULD REQUIRE 40K WORDS OF HARDWARE MEMORY. IT SHOULD BE NOTED THAT UNIX ALSO REQUIRES THE MEMORY MANAGEMENT OPTION OFFERED BY DEC TO RUN AT ALL. 7b

THE BASE OPERATING SYSTEM WAS DEVELOPED BY BELL LABORATORIES IN MURRAY HILL, NEW JERSEY. THE BELL INSTALLATION SUPPORTS A HIGH SPEED PAPER TAPE READER-PUNCH, NINE-TRACK MAGNETIC TAPE, AND DECTAPE. BESIDES THE CONSOLE TERMINAL, THERE ARE 14 VARIABLE SPEED COMMUNICATION DATASETS, AND A 201 SERIES DATASET FOR SPOOLING PRINTOUT TO A COMMUNAL LINE PRINTER. THERE ARE ALSO SEVERAL ONE-OF-A-KIND DEVICES INCLUDING A VOICE RESPONSE UNIT, A VOICE SYNTHESIZER, A PHOTOTYPESETTER, A DIGITAL SWITCHING

NETWORK, AND A SATELLITE PDP-11/20 WHICH GENERATES VECTORS, CURVES, AND CHARACTERS FOR A TEKTRONIX 611 STORAGE-TUBE DISPLAY. 7c

RELIABILITY 8

AS OF THIS WRITING, NETWORK UNIX HAS BEEN RUNNING ON A FULL TIME BASIS FOR ABOUT FOUR WEEKS. DURING THAT PERIOD, THERE WERE BETWEEN THREE AND FOUR CRASHES A DAY. THIS IS NOT A VALID INDICATOR BECAUSE MANY OF THE FAILURES WERE DUE TO HARDWARE COMPLICATIONS. MORE RECENTLY THE HARDWARE HAS BEEN RE-CONFIGURED TO IMPROVE RELIABILITY AND THE CRASH RATE HAS BEEN REDUCED TO ONE A DAY WITH A DOWN TIME OF 2-3 MINS. THIS IS EXPECTED TO CONTINUE, BUT THE SAMPLING PERIOD HASNT BEEN LONG ENOUGH FOR ANY DEPENDABLE ANALYSIS. 8a

AVAILABILITY 9

ALTHOUGH THE UNIX NETWORK SOFTWARE WAS DEVELOPED WITHOUT ARPA SUPPORT, THE CENTER FOR ADVANCED COMPUTATION IS WILLING TO PROVIDE IT GRATIS TO THE PEOPLE OF THE ARPA COMMUNITY. 9a

HOWEVER BELL LABORATORIES MUST BE CONTACTED FOR A LISCENSE TO THE BASE SYSTEM ITSELF. BELL'S POLICY IN THE PAST HAS BEEN TO LISCENSE THE SYSTEM TO UNIVERSITIES FOR A NOMINAL FEE, $150.00, AND UNFORTUNATELY FOR A COST OF $20,000.00 TO "NONUNIVERSITY" INSTITUTIONS. 9b

IN THIS LIGHT BELL WAS APPROACHED TO SEE WHAT THEIR REACTION WOULD BE TO AN ARPA NETWORK WIDE LISCENSE, THEY SAID THEY WERE OPEN TO SUGGESTIONS IN THAT AREA. SO SHOULD ENOUGH PEOPLE BECOME INTERESTED, PERHAPS A LESS EXPENSIVE FEE CAN BE NEGOTIATED. 9c

INTERESTED USERS WHO HAVE EITHER SOURCE LISTINGS OR SOURCE FILES INCLUDE: 9d

THE RAND CORPORATION WHICH IS USING OUR IMPLEMENTATION AS A BASIS FOR THEIR OWN VERSION. 9e

LINCOLN LABORATORIES WHICH HAS A SOURCE LISTING TO BE USED AS AN AID IN EVALUATION OF THE UNIX SYSTEM. 9f

THE INCO CORPORATION OF MC LEAN VIR. HAS A LISTING TO HELP IN THE INSTALLATION OF AN NCP INTO DEC'S RSTS OPERATING SYSTEM. 9g

IN ANY CASE WE ARE WILLING TO HELP ANY GROUP WITH ACQUISITION OF A SYSTEM. 9h

FOR FURTHER INFORMATION CONCERNING THE SYSTEM CONTACT: 9h1

STEVE HOLMGREN
210 ADVANCED COMPUTATION BLDG.
UNIVERSITY OF ILLINOIS
URBANA ILLINOIS 61801

(217)-333-8469
OR
HOLMGREN AT BBN

OUTLOOK AND FUTURE PLANS 10

WITH THE ADVENT OF TELNET IN UNIX, CURRENT PLANS ARE TO RUN THE SYSTEM OVER THE NEXT ONE OR TWO MONTHS AND WORK OUT ANY REMAINING BUGS. WHILE THIS IS GOING ON, EXTENSIVE BANDWITH AND LOAD TESTING IS GOING TO TAKE PLACE AND ANY REASONABLE IMPROVEMENTS MADE. 10a

AFTER TELNET HAS PROVED ITSELF RELIABLE, THE OPEN SYSTEM CALL WILL BE EXPANDED TO INCLUDE FURTHER PARAMETERIZATION. THIS PARAMETERIZATION WILL ENCOMPASS CONNECTIONS TO SPECIFIC SOCKETS, SIMPLEX CONNECTIONS BASED ON A SOCKET ALREADY IN USE, AND THE ABILITY TO LISTEN ON A LOCAL SOCKET. 10b

AFTER THOSE EXTENSIONS, NET MAIL, THEN NETWORK FTP AND FINALLY NETWORK RJE WILL BE IMPLEMENTED. ALL WILL RUN AS USER PROGRAMS SO THE KERNEL SYSTEM SIZE WILL NOT INCREASE. 10c

THERE IS ALSO INTEREST IN IMPLEMENTING SOME OF THE PROCEDURE CALL PROTOCOL BEING DEVELOPED BY THE NATIONAL SOFTWARE WORKS, BUT NO DEFINATE PLAN HAVE BEEN MADE. 10d

ACKNOWLEDGEMENTS 11

I AM MUCH INDEBTED TO GARY GROSSMAN WHO PARTICIPATED IN THE DESIGN AND WROTE THE NCP DAEMON; AND TO STEVE BUNCH WHO WAS THE

THE THIRD MEMBER OF OUR DESIGN GROUP AND WROTE THE KERNEL MESSAGE SOFTWARE. 11a

THE THREE OF US ARE PARTICULARLY APPRECIATIVE OF THE CRITICISM AND SUPPORT OF DR. HUGH FOLK, DR. PETER ALSBERG, GREG CHESSON, JOHN MULLEN, KARL KELLEY AND DAVE HEALY. 11b

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CENTER FOR ADVANCED COMPUTATION 1/10/74 12f

NWG/RFC# 681 JBP 14-MAY-75 14:38 32157
3/18/75 NETWORK UNIX S. Holmgren

(J32157) 14-MAY-75 14:38;;;; Title: Author(s): Jonathan B. Postel/JBP; Sub-Collections: NIC NWG SRI-ARC; RFC# 681; Clerk: JAKE; Origin: < POSTEL, RFC681.NLS;4, >, 14-MAY-75 17:26 JBP ;;;;####;

UNIX from Iseli

21-MAR-75 0218-PDT ISELI at SRI-AI: UNIX - general
Distribution: HILL AT OFFICE-1, iseli at isi
Received at: 21-MAR-75 05:14:51 1

Jess, 1a

There is a UNIX network system running now. Am going to go see it and get particulars 3,4,5 of April. Also, rumor has it that ARPA has a contract to RAND for the same thing. Thought you [and Dennis] would like to know. The running one has an NCP and TELNET now and they gonna do some other protocols as time and $$ allow. An RFC exists in draft form and will be distributed shortly - will get 'ya a copy. 1b

Warmest regards, 1c

Jean 1d

JNH 21-MAR-75 08:14 32158

UNIX from Iseli

(J32158) 21-MAR-75 08:14;;;; Title: Author(s): Jesse N. Hill/JNH;
Distribution: /DLM2([ACTION]) ; Sub-Collections: NIC; Clerk: JNH;

PAN 21-MAR-75 08:48 32159

napke,home,telephone,telivision

this is one of many test runs,,to see if i can access journal by title-word,,,,,actually keywords

napke,home,telephone,telivision

famous testing

PAN 21-MAR-75 08:48 32159

napke,home,telephone,telivision

(J32159) 21-MAR-75 08:48;;;; Title: Author(s): Penny A. Napke/PAN;
Distribution: /PAN([INFO-ONLY]) ; Keywords:
napke,telephone,home,telivision; Sub-Collections: NIC; Clerk: PAN;

SGR 21-MAR-75 09:47 32160

Request for Inputs on Future Training

With the training for the month of March either completed or scheduled, I'd like to begin work on a schedule of training for April and possibly May. 1

I'm aware of requirements for ARPA, NSRDC, BRL, and SRI but would like some inputs from the remaining architects as to what level of training you feel you need next and whether there are any bad (or good) times over the next two months for your organization. 2

Request for Inputs on Future Training

(J32160) 21-MAR-75 09:47;;;; Title: Author(s): Susan Gail Roetter/SGR; Distribution: /KWAC([ACTION]) RH([INFO-ONLY]) JMB([INFO-ONLY]) ; Sub-Collections: SRI-ARC KWAC; Clerk: SGR; Origin: < ROETTER, TRAIN.NLS;1, >, 21-MAR-75 09:44 SGR ;;;;####;

SGR 21-MAR-75 09:58 32161

Request for List of Names

I didn't write down who attended the NLS class at New London and remember the following: Jim Shores, George Egeland, Bruce,,, Arthur Werbner, Rita,,, and Sarah,,, (half day only). Could you send me a complete list? Thanks 1

SGR 21-MAR-75 09:58 32161

Request for List of Names

(J32161) 21-MAR-75 09:58;;;; Title: Author(s): Susan Gail Roetter/SGR; Distribution: /JPS([ACTION]) GE2([ACTION]) ; Sub-Collections: SRI-ARC; Clerk: SGR;

SGR 21-MAR-75 10:05 32162

How to Print Undeliverable Mail

When we were talking the other day you asked about printing undeliverable mail. You can do that with the following process: in Tenex type copy /<ESC> CTRL V (the lowercase character beginning the name) <ESC> tty: <CR>
Let me know if you have trouble.

SGR 21-MAR-75 10:05 32162

How to Print Undeliverable Mail

(J32162) 21-MAR-75 10:05;;;; Title: Author(s): Susan Gail Roetter/SGR; Distribution: /SMT([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: SGR;