AAM 26-JUL-72 6:19 11144

A Test Message to Dave Walden

Hi Dave ,
  This is a test message from Alex.
Goodbye

1

AAM 26-JUL-72 6:19 11144

A Test Message to Dave Walden

(J11144) 26-JUL-72 6:19; Title: Author(s): Alex A. McKenzie/AAM;
Distribution: David C. Walden/DCW3; Sub-Collections: NIC; Clerk: AAM;

AAM 26-JUL-72 6:30 11145

Test journal document for Dave Walden

This is a test message to Dave Walden which has complicated structure. It has two main branches. 1

Will he get them both? 1a

This is the second branch 2

AAM 26-JUL-72 6:30 11145

Test journal document for Dave Walden

(J11145) 26-JUL-72 6:30; Title: Author(s): Alex A. McKenzie/AAM;
Distribution: David C. Walden/DCW3; Sub-Collections: NIC; Clerk: AAM;

DVN 26-JUL-72 8:33 11146

DLS' Visit to ARC: Notice of Draft Memoranda

My directory contains drafts of notes on last week's meeting among Duane, Charles, Jim Norton, and me (vannouhuys,jbaseline,); among Walter Bass, Duane, and me (vannouhuys, jmtg,), and on bussiness unfinished at the end of Duane's visit to the Center (vannouhuys,jbrs,). 1

I intend to polish these files and journalize them on Friday. 2

Please comment on them either to me directly or by adding substatements labeled "COMMENT:". 3

DVN 26-JUL-72 8:33 11146

DLS' Visit to ARC: Notice of Draft Memoranda

(J11146) 26-JUL-72 8:33; Title: Author(s): Dirk H. van Nouhuys/DVN; Distribution: Duane L. Stone, Charles H. Irby, James C. Norton, Dirk H. van Nouhuys/DLS CHI JCN DVN; Sub-Collections: SRI-ARC; Clerk: DVN; Origin: <VANNOUHUYS>DRAFTDRAFT.NLS;1, 26-JUL-72 8:28 DVN ;

Test of Letter Form

If this doesn't work, it only goes to prove that augmentation is a step backward (two steps?).

Test of Letter Form

Test of Letter Form

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

.FullAddress;

Dear .Name;:

This letter is a formal acceptance from the Augmentation Research Center to your invitation of March 26, 1972 (our XDOC -- 10829,): we offer our system as a candidate for your analyses, including making it available "on-site" at Stanford in your March 1973 workshop. I understand that you will let us know as soon as possible (e.g., by November 1972) as to whether you want to include our system, and if so, the details of the tests, and analyses. 1

As I mentioned in our 26 June telephone conversation, our system isn't considered by us to be "primarily oriented towards information storage and retrieval" as cited on page 8 item 7 of your proposal (our XDOC -- 10830,). We shall trust the judgement of you and Tom Martin for evaluating our system within a reasonable framework. 2

You might remember that I also brought up the matter of relative operator skill in the actual evaluative tests on the different systems. It generally takes months of continuous use and persistent experimenting to become really skillful with our whole system. It is true that a modest amount of experience with it will provide a certain level of utility, and we assume that at this level comparative experiments on retrieval test problems, by one or more operators trained to use all of the systems, would provide relevant evaluative data. But I hope you will consider, for our system as well as for any of the others where practiced skill may make significant performance differences, that possibly you would include some tests where the operators are highly practiced users. In our Center, for instance, we make a definite distinction in our developmental efforts between the "NLS retrieval subsystem" as designed for novice users, and the retrieval subsystem as designed for sophisticated users. We would be interested in having both subsystems evaluated. 3

For communications and general administration of this experiment, I have asked Mr. Dirk van Nouhuys to be our liaison with you (and

Test of Letter Form

Tom Martin); among other things he can make arrangements for Tom to familiarize himself with our system. If and when it becomes appropriate, Dirk can bring into the scene Dr. Jacques Vallee who is in charge of developing our "novice retrieval interface" and/or Mr. Charles Irby, who will be responsible for the skilled-user retrieval interface. 4

The project sounds very worthy, and I think we would benefit from participating. 5

Sincerely,

D. C. Engelbart, Ph.D.
Augmentation Research Center

kfb

NDM 26-JUL-72 9:18 11147

Test of Letter Form

(J11147) 26-JUL-72 9:18; Title: Author(s): N. Dean Meyer/NDM;
Distribution: Kay F. Byrd/KFB; Sub-Collections: SRI-ARC; Clerk: KFB;
Origin: <BYRD>EF.NLS;5, 13-JUL-72 16:42 KFB ;

ARC Operator's Manual

Table of Contents

Statement No.

Conventions.....(2)

Notes on Important TENEX Capabilities.....(3)

Monitor DDT Capabilities.....(3a)

Notes on the NET.....(4)

How to use TELNET.....(4a)

What to do if TELNET fails.....(4b)

File System Information.....(5)

Programs which manipulate files.....(5a)

Checking the vailidity of the file system.....(5b)

Journal System Maint.....(6)

Brief Description of the JOURNAL system.....(6a)

ACTUAL PROCEDURES for BACKGROUND.....(6b)

Hardcopy Formatting Description.....(6c)

Journal Submission Test.....(6d)

Maintain various documents of System.....(7)

Statistical Graphs useage SUPERWATCH.....(7a)

Monitor Listing Production via SRICOM.....(7b)

Appendix A. Operator Responsibilities.....(8)

Appendix B. Night Operator Schedule.....(9)

Appendix C. Day Operator Schedule.....(10)

Appendix D. Check list for when system down.....(11)

Appendix E. Important Phone Numbers.....(12)

Conventions 2

In writing these procedures, the following conventions have been adopted: 2a

1) Instructions about things to do are enclosed in parentheses. 2a1

Ex: (mount dectape on unit 0) 2a1a

2) When describing interactions with the system, characters typed in are capitalized, and characters typed out are lowercase. 2a2

3) Special control characters will be described with the following notations: 2a3

a) (ALT) is an Altmode 2a3a

b) (CR) is a Carriage Return 2a3b

c) (SP) is a Space 2a3c

d) (RUBOUT) is the Rubout key 2a3d

e) (control-D) is a Control D 2a3e

f) (control-C) is a Control C, etc. 2a3f

Notes on Important TENEX Capabilities 3

Monitor DDT Capabilities 3a

Monitor DDT gives the operator the capability of changing the contents of memory addresses within the monitor. This is an extremely useful tool, and allows changing various system flags. 3a1

DDTRCL (DDT Reclaim) 3a2

What DDTRCL does 3a2a

DDTRCL gets both Monitor DDT and the Symbol Table back into core from the disk packs. 3a2a1

ACTUAL PROCEDURES 3a2b

```
@ENABLE(CR)                                          3a2b1
 QUIT(CR)                                            3a2b2
./                                                   3a2b3
CALL DDTRCL(ALT)X  (<swpmon&ddtrcl$x)
  $                                                  3a2b4
DBUGSW/   0   1(CR)                                  3a2b5
(control-P)                                          3a2b6
abort                                                3a2b7
.Exec                                                3a2b8
 DISABLE(CR)                                         3a2b9
```

DDTFSH (DDT Flush) 3a3

What DDTFSH does 3a3a

DDTFSH flushes either both Monitor DDT and the Symbol Table or only the Symbol Table from core. The action of DDTFSH is determined by the setting of a flag called SYMDDT. The settings of SYMDDT do the following 3a3a1

1. non-0 - flushes only the Symbol Table 3a3a1a

2. 0 - flushes both Monitor DDT and the Symbol Table 3a3a1b

ACTUAL PROCEDURES 3a3b

```
@ENABLE(CR)                                          3a3b1
 QUIT(CR)                                            3a3b2
./                                                   3a3b3
SYMDDT/   n    Z(CR)                                 3a3b4
```

```
CALL DDTFSH(ALT)X  (.swpmon&ddtfsh$x)                    3a3b4
  $                                                      3a3b5
DBUGSW/   a   Y(CR)                                      3a3b6
(control-P)                                              3a3b7
abort                                                    3a3b8
.Exec                                                    3a3b9
 DISABLE(CR)                                             3a3b10
```

(Where in the above example, "n" is the previous number in SYMDDT, and "Z" is the number you set it to. Also, "a" is the number of the previous DBUGSW setting, and "Y" is the number which you typed in as the new setting.) 3a3b11

DBUGSW 3a4

What DBUGSW settings mean 3a4a

1, 0 - automatic mode 3a4a1
   a. Causes <SYSTEM>CHECKDSK to be run 3a4a1a
   b. Causes BACKGROUND to run RECOVF and continue 3a4a1b
   c. Causes system to autorestart for a BUGHLT 3a4a1c
   d. Allows users on system 3a4a1d
2. 1 - attended daytime mode 3a4a2
   a. Causes <SYSTEM>CHECKDSK to be run 3a4a2a
   b. Causes BACKGROUND to run RECOVF and continue 3a4a2b
   c. Causes system to halt for a BUGHLT if MDDT present 3a4a2c
   d. Allows users on system 3a4a2d
3. 2 - debugging mode 3a4a3
   a. Does not run <SYSTEM>CHECKDSK 3a4a3a
   b. Does not start up BACKGROUND 3a4a3b
   c. Causes system to halt for a BUGHLT if MDDT present 3a4a3c
   d. Does not allow users on system 3a4a3d

ACTUAL PROCEDURE 3a4b

```
@ENABLE(CR)                                              3a4b1
 QUIT(CR)                                                3a4b2
./                                                       3a4b3
DBUGSW/   a    X(CR)                                     3a4b4
(control-P)                                              3a4b5
abort                                                    3a4b6
.Exec                                                    3a4b7
 DISABLE(CR)                                             3a4b8
```

(Where in the above example, "a" is the number of the previous DBUGSW setting, and "X" is the number which you typed in as the new setting.) 3a4b9

ENTFLG 3a5

What ENTFLG settings mean 3a5a

ENTFLG governs whether or not users will be allowed to log in on the system. The settings for ENTFLG are as follows: 3a5a1

1. non-0 (usually 777777) - users allowed on 3a5a1a

2. 0 - no users allowed on 3a5a1b

ACTUAL PROCEDURES 3a5b

```
@ENABLE(CR)                                          3a5b1
 QUIT(CR)                                            3a5b2
./                                                   3a5b3
ENTFLG/    a     X(CR)                               3a5b4
(control-P)                                          3a5b5
abort                                                3a5b6
.Exec                                                3a5b7
 DISABLE(CR)                                         3a5b8
```

(Where in the above example, "a" is the number of the previous ENTFLG setting, and "X" is the number which you typed in as the new setting.) 3a5b9

Notes on the NET 4

How to use TELNET 4a

Explanation of TELNET 4a1

TELNET connects the user to any site on the NET (ie. through the IMP), and effectively sends a control-C to whatever site is specified. Once the connection with the host has been established, TELNET sends all your instructions to the host. You then receive output from the host via TELNET. After you log out from the host, TELNET is still running, and you must type a control-C to make TELNET come back up to the local EXEC. 4a1a

ACTUAL PROCEDURE 4a2

@TELNET(CR) 4a2a
telnet 27-oct-71 jtm 4a2b
answer questions with y or n. 4a2c
help? N 4a2d
verbose? N 4a2e
!c=(control-E) 4a2f
cob=(control-O) 4a2g
esc=(control-V) 4a2h
host: SRIARC(CR)
4a2i

arc-tenex 1.28.01.11 17-may-72 arc exec 1.32.01
4a2j

@LOGO(CR)
4a2k

killed job 23 (etc.) 4a2l
(control-C) 4a2m
@RESET(CR) 4a2n

What to do if TELNET fails 4b

Step 1. Restart NETSER 4b1

What NETSER does. 4b1a

NETSER is the Network Service Program, and is active only when a NET user is first logging in. When SRI-ARC is specified as the host for TELNET, NETSER is the program that simulates a control-C to our EXEC. After our (host) EXEC is started, NETSER has no more to do with that connection. It will now go into a waiting state until another user specifies ARC as the host in TELNET. 4b1a1

ACTUAL PROCEDURE 4b1b

@ATT SYSTEM BODY 2(CR) 4b1b1
(control-C) 4b1b2
@RESET(CR) 4b1b3
@RUN NETSER(ALT)(CR) 4b1b4

(NETSER will detach you as soon as it starts running.) 4b1b5

Step 2. Restart the entire NET. (Only if Step 1 fails.) 4b2

What restarting the NET does. 4b2a

NETON is a flag in the Monitor which indicates whether the NET is up. When NETON is 1, the Monitor expects the NET to be out there, and will service NET requests. With NETON at 0, the NET is effectively turned off. Going through the sequence of 1 to 0, and then 0 to 1, will first turn the NET off, and then back on. When it is turned back on, much of the code will be reinitialized, and if the NET was down, this will frequently correct the problem. 4b2a1

NOTE This procedure will kill any NET users currently on our system. You should inform them that the NET is going down via NOTIFY. Give them a time down and an expected time back up. 4b2a2

ACTUAL PROCEDURE 4b2b

@ENABLE(CR) 4b2b1
QUIT(CR) 4b2b2
interrupt at 6232 4b2b3
./ 4b2b4
NETON/ 1 0(CR) 4b2b5
./ 0(CR) 4b2b6
(Now you must wait for the ARC host dead light on the IMP to light up. When that light comes on, proceed with the following.) 4b2b7
./ 0 1(CR) 4b2b8
./ 1(CR) 4b2b9
(control-P) 4b2b10
abort 4b2b11
.Exec 4b2b12
DISABLE(CR) 4b2b13
@RESET(CR) 4b2b14

Step 3. Restart the system. (Only if Steps 1 and 2 have failed.) 4b3

See the TENEX OPERATING PROCEDURES MANUAL at the operator's console for information on how to do this. 4b3a

File System Information 5

Programs which manipulate files, i.e. DUMPER, BSYS, etc. 5a

Use of <SYSUTILITY>DUMPER 5a1

Single Mode - Retrieves single file(s) from dump tape 5a1a

ACTUAL PROCEDURES 5a1a1

1. Mount the correct dump tape, without a write ring 5a1a1a

2. CONN DIRECTORY-NAME PASSWORD(CR) 5a1a1b

(This is the directory which the retrieved file will go into.) 5a1a1c

3. Run program "DUMPER". 5a1a1d

```
@RUN <SYSUTILITY>DUMPER(ALT)(CR)
dump, load, check, or single?  S
type mag tape unit number: N
copy TAPE-FILE-NAME(SP) (to)
    DISK-FILE-NAME(CR)(CR)
copy (control-C)
@RESET(CR)
```

5a1a1d6

(In the above example, "N" is the number of the mag tape unit. "TAPE-FILE-NAME" is the complete name (including directory) of the tape file. Control-A is the only editing character you can use. (A control-A will backspace one character.) "DISK-FILE-NAME" is the name of that file when it is copied onto the disk. You may use all the EXEC editing characters for this name.) 5a1a1d7

Dump Mode - Dumps a directory or entire file system 5a1b

Dumping a single directory 5a1b1

1. Mount a blank tape on either tape unit and be sure it has a write ring in it 5a1b1a

2. @CONN DIRECTORY-NAME PASSWORD(CR) 5a1b1b

(You can only dump the directory you are connected to.) 5a1b1c

3. Run program "DUMPER" 5a1b1d

```
@RUN <SYSUTILITY>DUMPER(ALT)(CR)
dump, load, check, or single ? D
type identification info:  TEXT-???(CR)
type mag tape unit number: N
```

5a1b1d4

the dump should be running now.... 5a1b1d4a

(In the above example, "TEXT-???" is whatever text label you want on that dump tape, like "BLAP'S DIRECTORY". And "N" is the number of whatever mag tape unit you are using.) 5a1b1d5

When the dump is completed (tape stops) DUMPER will list on the line printer a listing of all files dumped. You must wait for the "@"

5a1b1d6

Dumping the entire file system 5a1b2

1. Mount blank tapes on tape units and be sure they have write rings in them 5a1b2a

2. ENABLE(CR) 5a1b2b

3. To run program "DUMPER" 5a1b2c

```
 RUN <SYSUTILITY>DUMPER(CR)
dump, load, check, or single ? D
dump whole disk? Y
incremental dump? N
type identification info:  TEXT..(CR)
(Like "FULL DUMP SET XXX")
type mag tape unit number: N
(Type unit of mounted tape)                    5a1b2c8

the dump should be running now...              5a1b2c9

When DUMPER has filled up the first tape, it
rewinds that tape and again asks the question:
                                               5a1b2c10
   type mag tape unit number: N
                                              5a1b2c10a
When the dump is completed (tape rewinds)
DUMPER will list on the line printer a listing
of all files dumped. You must wait for the " "

                                               5a1b2c11
4. If DUMPER dies sometime before completion,
follow the procedure below to dump the remainder
of the disk.
                                                5a1b2d

 RUN <SYSUTILITY>DUMPER(CR)
dump, load, check, or single ? D
dump whole disk? N
specific users? N
start with user:  USER-NAME(CR)
incremental dump? N
type identification info:  TEXT..
(Like "FULL DUMP SET XXX (CONT)")
type mag tape unit number: N                   5a1b2d9

   the dump should be running now....          5a1b2d9a

When DUMPER has filled up the first tape, it
rewinds that tape and again asks the question:
                                               5a1b2d10
   type mag tape unit number: N                5a1b2d10a
```

When the dump has completed (tape rewinds)
DUMPER will list on the line printer a listing
of all files dumped. You must wait for the " ".

5a1b2d11

Load Mode - Retrieves one directory or the entire file system 5a1c

Retrieving a single directory 5a1c1

1. Mount correct tape, without write ring 5a1c1a

(You need not CONN the target directory.) 5a1c1b

2. Run program "DUMPER" 5a1c1c

```
@RUN <SYSUTILITY>DUMPER(ALT)(CR)
dump, load, check, or single? L
specific users? Yes, users:
USER-1,USER-2,USER-3(CR)
into same directory(s)? Y
type mag tape unit number: N
```

5a1c1c5

(The tape should now be moving. DUMPER will print a list of all directories on the tape it is reading, even though it only needs to copy one (or more) of the directories. When DUMPER finishes, it will type the message, "done", and rewind the tape.) 5a1c1c6

(In the above example, "USER-1" is any directory on the system. You may specify either one or multiple users. If several users are specified, you must separate each with a comma (","). DUMPER will recognize (ALT) when specifying USER-1, USER-2, etc.) 5a1c1c7

Retrieving entire file system 5a1c2

You must be logged in as a WHEEL or OPERATOR

```
@ENABLE(CR)
 QUIT(CR)
interrupt at 6165
.Halt tenex.
press STOP,RESET and READIN on the console (in
that order)

   (The DEC tape should now be moving. When it
   stops, DTBOOT will type a (cr) carriage
   return.)

/L(CR)
/100(CR)
/G(CR)
DBUGSW/  0   2(CR)
SYSLOD(ALT)G
do you really want to clobber the bit table...? Y
tenex restarting,wait...
(control-C)
no exec
.Reset.
.Init bit table.
read badspots from file:  DTA0:BADSPT.DSK(CR)(CR)
    (Note: You must type two (2) CR's if you type
   out the entire file name (i.e. no altmode).)
    (A print-out of the most recent version of
   BADSPT.DSK can be found in the section "General
   Procedures" in the TENEX OPERATING
   PROCEDURES.))

(Alternate procedure for typing badspots on system
console,or to append more badspots to the list on
DEC tape.)

         .Reset.
         .Init bit table.
         read badspots from file: TTY:(CR)(CR)
         (Now type disk addresses(hardware)
   seperated by (CR).)
         eg:
         1234(CR)
         3300500(CR)
         (control-Z)
.Reset.
```

```
(You must now mount DEC tape number 27 on the
unused unit, and dial "1" into the window of that
unit.  This tape has a copy of DUMPER.SAV on it.)

.Mount dta1(cr)
.Get file DTA1:DUMPER.SAV(CR)
.Start.
mini-dumper  3 mar 71
dump,load,check, or single? L
specific users? N
type mag tape unit number: N
   (DUMPER will now type the tape
   number,identification and   date of the mounted
   tape.)

mini-dump tape # 1  identification text...
day,date & time

   (DUMPER will now load all users files on this
   tape it also creates the users directories as
   it encounters each user. When this tape is
   loaded DUMPER will type:)

mount next tape...type c when ready. type n if no
more: C
type mag tape unit number: N
    Continue the above process until all tapes
   have been loaded; When the last tape is
   finished type "N" instead of "C"; DUMPER may
   crash at this point but don't worry all is
   well.  When DUMPER terminates, you will be
   returned to the MINI-EXEC, and a "." will be
   typed.

.Reset.
.Exec

              *** NOTE    ***

Special Note No. 1 - You must now do a Halt Tenex
and Restart from DEC tape.
Special Note No. 2 - You should also check the
validity of the file system by running
<SYSTEM>CHECKDSK and <SUBSYS>BSYS (Verify Mode).  5a1c2ai
```

Use of <SUBSYS>BSYS 5a2

Trim Command 5a2a

What Trim does 5a2a1

Trim will go through all the directories in the file system, and delete all but the specified number of versions of each file in that directory. However, trim does not expunge these files. That is done in a separate operation. 5a2a1a

ACTUAL PROCEDURE 5a2a2

```
@BSYS(ALT)(CR)
*T(ALT)rim (user directories)(CR)
enter versions to retain: X(CR)
 really? Y(CR)
*E(ALT)xit(CR)
@RESET(CR)
```

5a2a2f

(In the above, "X" is the number of versions to be left undeleted. Usually this number is 1 (one).) 5a2a2g

Restore Command 5a2b

What Restore does 5a2b1

Restore brings back one file from a BSYS-dumped tape, and writes it on the disk with all the exact characteristics of that file when it was originally on-line. I.e., the directory, name, extention, version number, and ARCHIVE parameters are exactly the same. 5a2b1a

ACTUAL PROCEDURE 5a2b2

```
@BSYS(ALT)(CR)
R(ALT)estore files (from tape)
enter tape unit (mtan:) MTAX(CR)
listing to file: TTY:(CR)
  mounting tape directory
restore mtan: TAPE-FILE-NAME(CR)
restore mtan: (RUBOUT)
*E(ALT)xit(CR)
@RESET(CR)
```

5a2b2i

(In the above, "X" is the number of the tape unit. "TAPE-FILE-NAME" must include the directory name, as well as the other file descriptors. Altmode can be used to recognize both the tape file's directory name and file name. However, if you use an altmode for recognition of the file name, you do not need to type the confirming CR.) 5a2b2j

Single Command 5a2c

What Single does 5a2c1

Single also allows you to retrieve a file from a BSYS-dumped tape. However, it differs from Restore, in that you can specify new file descriptors, rather than simply accept the old ones. 5a2c1a

ACTUAL PROCEDURE 5a2c2

```
@BSYS(ALT)(CR)
S(ALT)ingle files(CR)
enter tape unit (mtan:) MTAX(CR)
  mounting tape directory
copy mtan: TAPE-FILE-NAME(CR) (to)
DISK-FILE-NAME(CR)(CR)
copy mtan: (RUBOUT)
*E(ALT)xit(CR)
@RESET(CR)
```

5a2c2h

(In the above, "X" is the number of the tape unit. "TAPE-FILE-NAME" must include the directory name, as well as the other file descriptors. Altmode can be used to recognize both the tape file's directory name and file However, if you use an altmode for recognition of the file name, you do not need to type the confirming CR. Also, if you use an altmode for the DISK-FILE-NAME, you only need 1 (one) confirming CR.) 5a2c2i

Checking the vailidity of the file system 5b

CHECKDSK 5b1

What CHECKDSK does 5b1a

CHECKDSK checks out the page allocation of the file system. It checks to see if any pages are assigned to two or more files. It also checks several other possible problems, but can correct most of these. The one error condition that cannot be corrected by CHECKDSK is an MDA (or Multiply Defined Area). The procedure below indicates how to handle such a condition. 5b1a1

ACTUAL PROCEDURE 5b1b

```
@RUN CHECKDSK(ALT)(CR)                                  5b1b1
rebuilt bit table? N                                    5b1b2
@RESET(CR)
                                                        5b1b3
```

(When CHECKDSK terminates, it should produce a printout of the form:)

```
    XXXX pages free, XXXXX pages in use.
                                                        5b1b4
```

If CHECKDSK has typed out a list in the form of:

```
    112112 not in bt
    <ferguson>work.blap;99
    457230 not in bt
```

all is still OK, CHECKDSK will clean up the problem. 5b1b5

However, if it has typed a list of the form:

```
    <ferguson>work.blap;99
    4  mda
```

you must delete and expunge any files which have numbers preceding MDA greater than 1 (one). (A list of users and associated passwords is in the TENEX OPERATING PROCEDURES MANUAL on the console.) 5b1b6

After performing the necessary deletes and expunges, you must rerun CHECKDSK, to make sure the disk is really OK. The above checks on the type-out of CHECKDSK must also be made. If CHECKDSK types more errors, the whole process must be repeated until you are sure that the disk is OK. 5b1b6a

BSYS - Verify Mode 5b2

What Verify does 5b2a

BSYS-Verify checks all the pointers in the FDB (File Description Block) of each directory. If these pointers are not correct, BSYS cannot correct the problem, but will print an error concerning it. The conditions checked by BSYS are different from those checked by CHECKDSK. 5b2a1

ACTUAL PROCEDURE 5b2b

```
@BSYS(ALT)(CR)                                          5b2b1
*V(ALT)erify (user directories)(CR)                     5b2b2
entire file system? Y(CR)                               5b2b3
disc verify too? N(CR)
                                                        5b2b4
(BSYS will not print all the directory names as it
checks them.)
                                                        5b2b5
*E(ALT)xit(CR)                                          5b2b6
@RESET(CR)                                              5b2b7
```

Journal System Maint. 6

Brief Description of what the JOURNAL system does 6a

General Description 6a1

The JOURNAL system provides the capability of one person to submit a file or message which will be stored permanently. The submitter also specifies who should be informed that this document exists, and all addressees are notified by the JOURNAL system that the document exists. Each addressee then has the option of reading the document either on-line, on a hardcopy print-out, or both. 6a1a

Brief trace of what happens to a document when it is submitted. 6a2

Step 1. (User seen) A user submits a file (or message) to the journal, specifying the people to receive this document. 6a2a

NOTE. This cannot be done if RECOVF has not been run once since the last time the system came up, or if BACKGROUND is in SNKERR. The user will get the error message, "Journal System Temporarily Unavailable". 6a2a1

Step 2. (Unseen by user) After a file is submitted, it goes to directory <TEJOURNAL>, which is a temporary sink for all submitted files. 6a2b

Step 3. (Unseen by user) When ONJDEL (On-line Journal Delivery) runs, the file is actually processed. The following things will happen: 6a2c

a. The file will be moved from <TEJOURNAL> to <JJOURNAL>, or whatever is the currently used directory. The file stays in <JJOURNAL> permanently. 6a2c1

b. A notation is made in all the initial files specified by the submitter concerning the title, author, and location (identified with an NLS link) of the submitted document. 6a2c2

c. The JOURNAL catalogues are updated to include references to this document. 6a2c3

Step 4. (User seen) Each person noted for distribution can look at this document by first reading his initial file. Using the notation placed in that initial file by ONJDEL, he can quickly locate and read the document on-line. 6a2d

Step 5. (Unseen by user) When Hardcopy Formatting runs, this document will be printed out several times, according to the distribution originally specified. At least two copies are always made, for the two catalogues (Master and Access) that we maintain. Also, copies are printed for any non-ARC addressee. These copies are mailed out by the PSO people. 6a2e

Description of functions of BACKGROUND, the job that runs the JOURNAL system. 6a3

All the JOURNAL system works by using <SUBSYS>NLS. This is the program which a user uses when he interacts with the JOURNAL system, and also the program which BACKGROUND runs to do the user-unseen aspects of document handling. 6a3a

The parts of NLS which a user needs to submit a file, or read the contents of one are important, but not an operator function. However, understanding the way BACKGROUND functions is important, since this area of user-unseen processes are the ones which the operators must maintain. 6a3b

BACKGROUND has five different functions which it performs, and they are the following:
**6a3c

1. RECOVF, or Recover Files. This process checks the validity of all <JOURNAL> files needed to run the JOURNAL system. A NLS file-verify is done to all these files. 6a3c1

The following files are checked by RECOVF, If any are bad, the JOURNAL will not run.
<JOURNAL>HCDISTFILE.NLS - used for on-line and hardcopy delivery
<JOURNAL>TCNUMBERS.NLS - used for numbering system
<JOURNAL>RFCNUMBERS.nls - used for numbering system
<JOURNAL>TJCAT.NLS - temporary catologue prior to ONJDEL
<JOURNAL>JRNL4.NLS - file where all messages are kept

<JOURNAL>DISTFILE.NLS - used by ONJDEL as working file
<JOURNAL>IDENTFILE.NLS - file of user identification codes for NLS and JOURNAL
<JOURNAL>CNUMBERS.NLS - used for numbering system
<JOURNAL>JCAT.NLS - permanent catalogue where a file is entered when ONJDEL runs
<JOURNAL>DISTWORK.NLS - used by ONJDEL as working file 6a3c1a10

2. SNKSLP, or sync sleep. This is an idle state in which no processing is done. 6a3c2

3. ONJDEL, or on-line journal delivery. This step does two different processes: 6a3c3

a. Makes a notation in initial files, concerning submitted documents 6a3c3a

b. Takes files out of <TEJOURNAL> and puts them into <JJOURNAL> or soon <KJOURNAL> 6a3c3b

4. SLINKER, or slinker. This updates the <JOURNAL> files which have been changed during ONJDEL. 6a3c4

5. SNKERR, or sync error. This indicates that BACKGROUND is hung up in some error state, and that no further processing can be done until the condition is corrected. 6a3c5

The above functions can only be run in a given sequence. This sequence is outlined below: 6a3d

1. RECOVF runs only once after the system has been restarted from either a crash or a HALT TENEX. Since the journal cannot run unless this step has been performed, this automatically runs when the system is restarted (unless DBUGSW = 2 at start-up time). 6a3d1

2. ONJDEL runs four times per day, 7 am, 1 pm, 6 pm, and 9 pm. It takes approx. 15 minutes to 1 hour for this to run. SLINKER always runs immediately afterwards, and takes about 5 minutes. Under no conditions should either of these processes be interrupted and stopped. If necessary, you can temporarily stop them with a control-C, but you must allow them to eventually CONTINUE from that point. Do NOT do a RESET, LOGOUT, or HALT TENEX to either of these processes. 6a3d2

3. SNKSLP is the no processing condition which BACKGROUND is in most of the time. Whenever it is not in RECOVF, ONJDEL, or SLINKER, it is in SNKSLP. You can interrupt this process, and can do so with a control-C or control-C, RESET conbimation. 6a3d3

4. Note: BACKGROUND can also be in SNKERR. If at any time RECOVF, ONJDEL, or SLINKER encounters an error condition which it cannot process, BACKGROUND stops, and the condition SNKERR is displayed on a SYSTAT. This condition can sometimes be corrected by rerunning RECOVF. If this fails further help should be sought. 6a3d4

ACTUAL PROCEDURES for BACKGROUND 6b

1. How to start up RECOVF, and then have it cycle through ONJDEL, SLINKER, and SNKSLP automatically (Normal Condition). 6b1

```
@JOB(CR)                                                    6b1a
 tts job 3, user background, tty??                          6b1b
@REFUSE AUTOLOGOUT(CR)                                      6b1c
@RESET(CR)                                                  6b1d
@GET <SUBSYS>NLS(ALT)(CR)                                   6b1e
@DDT(CR)                                                    6b1f
LIBENT(ALT)G                                                6b1g
lib entry: Journal mant.                                    6b1h
*Recover files Go? (control-D)  --running
                                                            6b1i
   (Now the files being verified will be printed out.
An example is:
<journal>hcdistfile.nls
file verify in progress                                     6b1j
(When you are returned to the asterik command level,type
as follows:
                                                            6b1k
*Continuing Go? (control-D)  --running
detaching                                                   6b1l
```

2. How to start up RECOVF, but then return BACKGROUND to the EXEC, so that ONJDEL and SLINKER will not run. 6b2

```
@JOB(CR)                                                    6b2a
 tts job 3, user background, tty??                          6b2b
@REFUSE AUTOLOGOUT(CR)                                      6b2c
@RESET(CR)                                                  6b2d
@GET <SUBSYS>NLS(ALT)(CR)                                   6b2e
@DDT(CR)                                                    6b2f
LIBENT(ALT)G                                                6b2g
lib entry: Journal mant.                                    6b2h
*Recover files Go? (control-D)  --running
                                                            6b2i
   (Now the files being verified will be printed out.
An example is:
<journal>hcdistfile.nls
file verify in progress                                     6b2j
(When you are returned to the asterik command level,type
as follows:
                                                            6b2k
*(control-C)                                                6b2l
@RESET(CR)                                                  6b2m
@DETACH(CR)                                                 6b2n
detaching job no. 3                                         6b2o
```

3. How to start up BACKGROUND so that it will cycle through ONJDEL, SLINKER, and SNKSLP automatically, without running RECOVF. 6b3

```
@JOB(CR)                                                    6b3a
 tts job 3, user background, tty??                          6b3b
@REFUSE AUTOLOGOUT(CR)                                      6b3c
@RESET(CR)                                                  6b3d
@GET <SUBSYS>NLS(ALT)(CR)                                   6b3e
@DDT(CR)                                                    6b3f
LIBENT(ALT)G                                                6b3g
lib entry: Journal maint.                                   6b3h
*Continuing Go? (control-D)  --running
detaching                                                   6b3i
```

Hardcopy Formatting Description 6c

Requirements of formatting 6c1

1. This process cannot be run while ONJDEL runs. You must take BACKGROUND up to the EXEC before starting hardcopy. After hardcopy is finished, you must restart BACKGROUND via Procedure No. 3 above. 6c1a

2. This process does not require that RECOVF be previously run. It is the only JOURNAL process which does not require RECOVF. 6c1b

ACTUAL PROCEDURE 6c2

(control-C) 6c2a
arc-tenex 1.28.07 arc-exec 1.32.08 6c2b
@LOG DOCUMENTATION FREAK 1(CR) 6c2c
@REFUSE AUTOLOGOUT(CR) 6c2d
@NLS(CR) 6c2e
id: JCP(CR) 6c2f
device: Ti-terminal 6c2g
*Execute Journal 6c2h
&Hardcopy journal distribution 6c2i
password: JPD 6c2j
operator: (control-D) 6c2k
&&Distribution Go? (control-D) (or) 6c2l
&&Collection Go? (control-D) 6c2m

(The program will now print out several journal document names, and who these are being printed for. When the list is exhausted, the program will return to the double & sign (&&).) 6c2n

&&Quit (control-D) 6c2o
&Execute Quit (control-D) 6c2p
@RESET(CR) 6c2q

Journal Submission Test 6d

This is a test to determine if the JOURNAL system is available for submission of documents. 6d1

ACTUAL PROCEDURE 6d2

@NLS(CR) 6d2a
id: JCP(CR) 6d2b
device: Ti-terminal 6d2c
*Execute Journal 6d2d
&Submit Message 6d2e

(If the JOURNAL is not up, you will get the message, "Journal System Temporarily Unavailable") 6d2f

(RUBOUT) 6d2g
&Quit (control-D) 6d2h
*Execute Quit (control-D) 6d2i
@RESET(CR) 6d2j

Maintain various documents of System 7

Statistical Graphs of system useage via SUPERWATCH 7a

What SUPERWATCH statistical commands do 7a1

As the system operates, one detached job called SYSTEM in subsys BIGBRO creates a file which contain various information about system usage. Whenever the system comes up from a crash, another file with a different version number is created, and information is entered on it. On a daily basis, these files are used as input to the following procedure, which produces a formatted print-out of the information. 7a1a

Each of these statistics files has a well defined name for easy location. They are always created in directory <ACCOUNTS> and have a file name of the date, an extention of "ST" (for statistics), and as many version numbers are needed for that day. For example, the files for June 15, 1972 (assuming 4 versions were created would be:
<ACCOUNTS>6/15/72.ST;1 through <ACCOUNTS>6/15/72.ST;4. 7a1b

ACTUAL PROCEDURE 7a2

```
@SUPERWATCH(ALT)(CR)                                    7a2a
-Print Graph(CR)                                        7a2b
time interval? N                                        7a2c
from file STAT-FILE-NAME(CR)                            7a2d
listing on LPT:(CR)                                     7a2e
# of horiz. chars = 100(CR)                             7a2f
# of lines = 50(CR)                                     7a2g
distribution or time plot? Time plot                    7a2h
parameter: GJ(CR)                                       7a2i
default scaling? Y                                      7a2j
done? N                                                 7a2k
parameter: %U(CR)                                       7a2l
default scaling? Y                                      7a2m
done? N                                                 7a2n
parameter: #U(CR)                                       7a2o
default scaling? Y                                      7a2p
done? Y                                                 7a2q
done                                                    7a2r
-Print Averages                                         7a2s
from file STAT-FILE-NAME(CR)                            7a2t
listing on LPT:(CR)                                     7a2u
print option name: BIGBRO(CR)                           7a2v
done                                                    7a2w
-Quit                                                   7a2x
@RESET(CR)                                              7a2y
```

(In the above, "STAT-FILE-NAME" refers to the particular statistics file which has not yet been printed. If there are several versions of one file, all versions must be run through this procedure.) 7a2z

Monitor Listing Production via SRICOM 7b

What SRICOM does 7b1

SRICOM prints a listing of the programs which currently make up the running Monitor. This program prints the listing after comparing that program with the original one we received from BBN. So the printed listing contains infomation about both what is currently in the file, and how that differs from the BBN program. 7b1a

SRICOM is told which files to list by reading a file called <TENEX>TENEX-LISTINGS-FILES.;1. This is a TECO file, which has pairs of file names. The first entry in the pair refers to the SRI-ARC version of that file, and the second entry refers to the BBN original. When SRICOM runs, it writes the version number of the SRI-ARC file which it has just printed in TENEX-LISTINGS-FILES. The next time SRICOM runs, it will only print out files which have a higher version number (i.e. they have been changed). 7b1b

ACTUAL PROCEDURES 7b2

@CONN TENEX(CR) 7b2a
@SRICOM(ALT)(CR) 7b2b
special? N 7b2c
how many copies do you want? X(CR) 7b2d
(SRICOM will now type all the files which it is printing.) 7b2e
@RESET(CR) 7b2f

(In the above example, "X" is the number of copies of each file which will be printed. Usually, this is 4 (four).) 7b2g

Appendix A. Operator Responsibilities 8

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. 8a

The following areas are those which the operators are responsible for as of the present date. 8b

1. Maint. of local system 8b1

a. Act as first shot trouble shooter for various system failures, attempting to coordinate activies of software and hardware personnel 8b1a

1. Bring system up from crash 8b1a1

a. Switch out of system any non-working device 8b1a1a

b. Check and repair (if neccessary) directory system 8b1a1b

2. Run diagnostics during day or off-hours 8b1a2

b. Collect statistics and format the UP-DOWN Chart 8b1b

c. Set DBUGSW at its appropriate setting (1 or 2 during day, and 0 during off-hours) 8b1c

2. Maint. of NET 8b2

a. Periodically check status of NETSER, esp. 5 am - 6 pm (and take appropriate corrective measures when it fails) 8b2a

1. Cycle NETSER if TELNET fails) 8b2a1

2. If Step 1 fails, notify any NET users, and cycle the NET (NETON off, then on) 8b2a2

3. If Step 2 fails, notify appropriate personnel, and fix hardware and/or cycle the monitor 8b2a3

b. Coordinate hardware efforts concerning IMP (i.e. maintain contact with BBN) 8b2b

3. Ride shotgun over file system 8b3

a. Retrieve files from dump and <ARCHIVE> tapes. 8b3a

b. Archive files for users 8b3b

c. Move files from one directory to another 8b3c

d. Copy various files to DEC tape for shipment to other software groups 8b3d

e. Insure that there is sufficient disk space (and run DELD if there is not) 8b3e

f. Make first shot repairs and adjustments (like disk alloc. and passwords) to directory system 8b3f

4. Journal System Maint. 8b4

a. 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. 8b4a

b. Run Journal Hardcopy Formatting job daily (and coordinate appropriate personnel if this fails) 8b4b

c. Coordinate printing of Journal Hardcopy 8b4c

d. Help JDH/CHI fix Journal when it is not available 8b4d

5. Insure that a system dump is made after every workday 8b5

a. Maintain sufficient number of blank tapes 8b5a

b. Coordinate on-call personnel 8b5b

6. Maintain various documents of System 8b6

a. Update Monitor Listings whenever necessary (about once every week to ten days, whenever a new Monitor is brought up) 8b6a

b. Maintain Dump Listings 8b6b

c. Update PROCEDURES Manual whenever necessary (same time as Monitor Listings) 8b6c

7. Provide user help and aid with various problems 8b7

Appendix B. Night Operator Schedule 9

This is the night operator's schedule. 9a

1. NOTIFY: System dump will begin at 3:00 am. 9a1

2. Run CHKPNT 9a2

*3. Do the DUMP 9a3

*4. Run TRIM (any errors other than "Locked", call) 9a4

5. Run DISCUSE 9a5

6. Run DELD 9a6

*7. Run DISCUSE 9a7

Note: If less than 500 pages, contact on-call person 9a7a

*8. Check capability for Journal Submission 9a8

Note: Start BACKGROUND up with RECOVF if submission test fails 9a8a

*9. Test NET via TELNET (before 5:00 am) 9a9

a. (optional) ATT job 2, RESET, and RUN NETSER 9a9a

b. (optional) turn NETON to 0, wait one minute, then to 1; then attemp a. again 9a9b

c. (optional) If you cant get a good run of TELNET, call answering service (321-4412), and tell them NET will be down until 8:30 am. 9a9c

10. ATT BACKGROUND and return to EXEC with control-C (only if BACKGROUND in SNKSLP) 9a10

11. LOGIN DOCUMENTATION and start hardcopy formatting job 9a11

12. Get most recent Journal catalog print-out, by running RUNFIL: JOUR-CAT 9a12

13. (when necessary) Update Monitor Listings, via SRICOM 9a13

14. print any files in <ACCOUNTS> via SUPERWATCH, and DELETE them 9a14

15. At completion of formatting, dump formatted <DOCUMENTATION> files onto mag tape(s) for 360 with <BSYS>MAG-TAPE and place the tape on the day operator's desk. 9a15

*16. Also at completion of formatting, restart BACKGROUND by starting up BACKGROUND according to Procdure No. 3 (ONJDEL, SLINKER, and SNKSLP cycling).

9a16

* This job must run correctly. The on-call person should be notified if the night operator cannot get a good run of this particular job. 9a17

Appendix C. Day Operator Schedule 10

Morning Routines 10a

1. See if there is a response to a Control-c 10a1

2. Login into NET 10a2

3. Call Monitor DDT Reclaim (DDTRCL), and set DBUGSW to 1 10a3

4. Check that that JOURNAL system is up (by performing Journal Submission Test), and start or correct if the system is down 10a4

4. Give SUPERWATCH print-out of system statistics to JCN, and then to storage 10a5

5. Check status of Journal Hardcopy run, i.e. check number of formatted files produced 10a6

Evening Routines 10b

1. Flush Monitor DDT (DDTFSH), and set DBUGSW to 0 10b1

2. Check that there are enough tapes (about 10) for that night's dump 10b2

3. Check that all tape drives are turned off 10b3

4. Make sure Monitor Tape is on Unit 8 - Remote 10b4

5. Leave message for night operator, concerning special duties or problems 10b5

6. Take tape with formatted Journal Hardcopy files (from directory <DOCUMENTATION>) to the 360, and pick up previous day's bursted print-out 10b6

7. Call NIC Answering Service and leave message concerning evening schedule 10b7

8. Make sure that the correct on-call name is up for that night 10b8

Periodic Duties (RUNFIL: <FERGUSON>Q.RUN checks items 1 - 3) 10c

1. Check NET, once per hour 10c1

2. Check to see if enough disk pages (at least 500 pages), once every 2 hours, and run DELD if necessary 10c2

3. Check on status of BACKGROUND once every 2 hours 10c3

4. Bring system up from crash whenever necessary 10c4

5. Call NIC Answering Service if ARC is going to be down for more than 15 minutes 10c5

6. Retrieve files for users upon request 10c6

Appendix D. Things to look for when the system goes down. 11

1. Printed error messages 11a

   a. Check both the console teletype and the system logger for BUGHLT's or other error messages 11a1

   b. Look up in OPERATING MANUAL as to meaning of any BUGHLT's 11a2

2. Control Panel Lights 11b

   a. PI ACTIVE lights - all lit(normal condition) 11b1

   b. PI REQ, PI IN PROG, and IOB PI REQ - all off, maybe flickering (normal condition) 11b2

   c. ADDRESS REGISTER at 000000 - flickering (normal) 11b3

   d. ADDRESS REGISTER at 760000 - slowly counting (normal) 11b4

   e. PROGRAM STOP and MEMORY STOP - off (normal) 11b5

3. APR (Arithmetic Processor) Error Lights - off (normal) 11c

   a. PWR FAIL - power failure 11c1

   b. ADR BRK - address break 11c2

   c. PAR ERR - parity error 11c3

      (common error condition) 11c3a

   d. PAR EN - parity stop enabled on console 11c4

      (not an error) 11c4a

   e. PDL OV - pushdown command list overflow 11c5

   f. MEM PROT - memory protection violation 11c6

      (not currently used) 11c6a

   g. NXM FLAG - non-executable memory request from APR 11c7

      (common error condition) 11c7a

   h. CLK EN - clock enabled 11c8

      (not an error) 11c8a

i. CLK FLAG - clock flag 11c9

(not an error) 11c9a

4. Memory Boxes (this is for normal condition) 11d

a. Pager - PAR STP should be off 11d1

b. Memory Buffer+parity bit = an odd number 11d2

c. DONE light is on 11d3

(otherwise that box is hung, and must be RESET from inside the front door) 11d3a

5. Display Controller Indicators 11e

a. DC-1 BSY and DC-2 BSY - on 11e1

b. DC-1 ERR and DC-2 ERR - off 11e2

Appendix E. Important Phone Numbers 12

1. NIC Answering Service - 321-4412 12a
2. Network Control Center - (617) 491-0475 12b
3. Smokey Wallace - 327-8375 12c
4. Bill Ferguson - 327-7270 12d
5. Ken Victor - 964-9870 12e
6. Jim Norton - 851-0589 12f
7. Ed van de Riet - 968-0660 12g
8. Martin Hardy - 366-6634 12h

(J11149) 26-JUL-72 11:33; Title: Author(s): William R. Ferguson/WRF; Distribution: Kirk E. Kelley, N. Dean Meyer, Joy A. Glenn, Kay F. Byrd, Ralph Prather, James E. White, Augmentation Research Handbook, Jacques F. Vallee, Diane S. Kaye, Paul Rech, Michael D. Kudlick, Don Limuti, William R. Ferguson, Linda L. Lane, Marilyn F. Auerbach, Walt Bass, Douglas C. Engelbart, Beauregard A. Hardeman, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Mil E. Jernigan, Harvey G. Lehtman, Jeanne B. North, James C. Norton, Cindy Page, William H. Paxton, Jeffrey C. Peters, Jake Ratliff, Barbara E. Row, Ed K. Van De Riet, Dirk H. van Nouhuys, Kenneth E. Victor, Donald C. Wallace, Richard W. Watson, Don I. Andrews/SRI-ARC; Sub-Collections: SRI-ARC; Clerk: WRF;
Origin: <FERGUSON>OPR-MAN.NLS;84, 26-JUL-72 11:29 WRF ; ;

DVN 26-JUL-72 11:34 11150

Decor for the Bruce Parsley Room (J2100)

Everybody seems to agree that it would be nice if the Bruce Parsley Room (J2100) were more comfortable for small meetings. I had thought of getting a low round table and bean bag chairs like those at Xerox. Someone suggested getting some kind of smaller but comfortable chair. Other people may have other suggestions. Please pass them on to Barbara. 1

DVN 26-JUL-72 11:34 11150

Decor for the Bruce Parsley Room (J2100)

(J11150) 26-JUL-72 11:34; Title: Author(s): Dirk H. van Nouhuys/DVN; Distribution: Kirk E. Kelley, N. Dean Meyer, Joy A. Glenn, Kay F. Byrd, Ralph Prather, James E. White, Augmentation Research Handbook, Jacques F. Vallee, Diane S. Kaye, Paul Rech, Michael D. Kudlick, Don Limuti, William R. Ferguson, Linda L. Lane, Marilyn F. Auerbach, Walt Bass, Douglas C. Engelbart, Beauregard A. Hardeman, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Mil E. Jernigan, Harvey G. Lehtman, Jeanne B. North, James C. Norton, Cindy Page, William H. Paxton, Jeffrey C. Peters, Jake Ratliff, Barbara E. Row, Ed K. Van De Riet, Dirk H. van Nouhuys, Kenneth E. Victor, Donald C. Wallace, Richard W. Watson, Don I. Andrews/SRI-ARC; Sub-Collections: SRI-ARC; Clerk: BER;

this is a message to test out the journal system. lets see how
it
works.

j.pickens

1

(J11152) 26-JUL-72 14:15; Title: Author(s): John R. Pickens/JRP; Distribution: John R. Pickens/JRP; Sub-Collections: NIC; Clerk: JRP;

LPD 26-JUL-72 14:55 11153

Let's do patterns right (reply to DVN's 11135)

Dirk's point about the content analyzer brings out several worthwhile points about system methodology and manpower allocation. 1

First, there is no intrinsic reason why his pattern should not run with blinding speed, approaching that of Substitute or Sort. 2

In fact, there is no reason why his first, more complex pattern should not run essentially as fast as the second, simpler one. 2a

Both patterns run slowly because the pattern compiler in L10 has received relatively little attention compared to other aspects of NLS. 3

This illustrates an important point, namely, any group of creative people will produce ideas and need tools at a rate that far outstrips their ability to implement either with current software (or more properly system) technology. 4

In other words, someone has to be making decisions about better content analyzer vs. fast display recreate vs. DEX vs. catalogs etc.: there just isn't enough talent to go around, even amplified by NLS techniques. 4a

Another important point is that it is very easy for system-building groups to fall into the micro-optimization trap, i.e. to look for modules to improve rather than reconsider the boundary conditions or system organization. 5

For example, the cost of the studies which have been done to try to find micro-improvements in TENEX or NLS efficiency is probably comparable with the cost of another 64K of core, especially when taking the decreased efficiency of interactive workers into account. 5a

The same is true, in my opinion, of the cost of DEX versus the cost of a cheap minicomputer front end. (I don't believe in DEX and the PARC system probably won't have it.) 5b

With respect to NLS, this means (to me) that the growth of file-processing operations like Output Processor, Sort/Merge, Content Analyzer, Catalog and Baseline production should have diverted some manpower into considering general methods for efficient bulk processing rather than individual programs which have to "re-invent the wheel". 6

This point also lies behind some of my earlier comments on programmable NLS: knowledge and programs for certain kinds of

file processing, which is what NLS mostly does, should be centralized, documented, smoothed up, and demystified so the next layer of applications can use them. 6a

The Substitute and Sort packages show that it is disorganization and/or lack of resources, not ignorance of techniques or lack of CPU power (in first approximation) which makes the other file processors so slow. 7

This, by the way, includes the L10 compiler itself. 7a

While all this advice may seem out of place from someone who isn't an official member of the ARC community, I share the desire to see the ideas in NLS improved and expanded to the highest degree of utility, and therefore offer the following unsolicited suggestion: 8

Have someone, preferably Bill Paxton since he wrote it, redo the pattern compiler to produce (perhaps optionally) code which maximizes execution speed at the expense of space and compile time. 8a

The goal should be to produce code good enough to replace the present hand-coded Substitute package without significant loss of efficiency. 8a1

I have some ideas about how to do this, and I think the result would be interesting in computer science terms as well as being of great practical value and not immensely difficult. 8a2

While doing this, keep an eye on the Output Processor and the L10 compiler library, since the result should be able to replace most of the directive scanner in the former and the hand-coded recognizers in the latter. 8b

This course of action will result in less code to maintain, in a more centralized place, more susceptible to future improvement. 9

LPD 26-JUL-72 14:55 11153

Let's do patterns right (reply to DVN's 11135)

(J11153) 26-JUL-72 14:55; Title: Author(s): L. Peter Deutsch/LPD; Distribution: Kirk E. Kelley, N. Dean Meyer, Joy A. Glenn, Kay F. Byrd, Ralph Prather, James E. White, Augmentation Research Handbook, Jacques F. Vallee, Diane S. Kaye, Paul Rech, Michael D. Kudlick, Don Limuti, William R. Ferguson, Linda L. Lane, Marilyn F. Auerbach, Walt Bass, Douglas C. Engelbart, Beauregard A. Hardeman, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Mil E. Jernigan, Harvey G. Lehtman, Jeanne B. North, James C. Norton, Cindy Page, William H. Paxton, Jeffrey C. Peters, Jake Ratliff, Barbara E. Row, Ed K. Van De Riet, Dirk H. van Nouhuys, Kenneth E. Victor, Donald C. Wallace, Richard W. Watson, Don I. Andrews, James G. Mitchell/SRI-ARC JGM; Sub-Collections: NIC SRI-ARC; Clerk: LPD;

DCE 27-JUL-72 16:34 11157

Letter to P. Slayton re 11156

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

Professor Philip Slayton
Faculty of Law
Chancellor Day Hall
3644 Peel Street
Montreal 112, Quebec, Canada

Dear Professor Slayton:

Your research project on the future capability and implication of computers sounds very interesting; it would indeed seem relevant for you and me (or some of my senior staff) to get together. We will be happy to have you visit us on either August 29 or 30. 1

There is a fairly high probability that my family and I will be on vacation through that week, in which case I will be unable to meet with you personally. However, there are some 33 people in our Center, many of whom can give you a good demonstration of the capabilities of our system and provocative discussions about the implications. I will ask Mr. Jim Norton to see that you are well taken care of; please ask for him directly. He has perhaps the most appropriate background amongst my senior staff towards matching to your particular questions, and is perhaps the most skilled user of the tools that we have built. 2

I am very sorry that I am unlikely to meet with you (although there is perhpas a 10 percent chance that I will be here). I'm enclosing a reprint (3954,) of a paper that, while almost four years old, gives perhaps the most concise picture of the nature of our research. 3

Sincerely,

Douglas C. Engelbart
Augmentation Research Center

kfb

Letter to P. Slayton re 11156

(J11157) 27-JUL-72 16:34; Title: Author(s): Douglas C. Engelbart/DCE; Sub-Collections: SRI-ARC; Clerk: KFB;
Origin: <BYRD>SLAYTON.NLS;2, 27-JUL-72 16:17 KFB ;

.HJournal="dce 3 AUG 72 4:25AM 11157";

LPD 27-JUL-72 11:57 11160

Are you still modifying IMNLS?

Are you still modifying IMNLS? There are some things I would like to try. Jim Mitchell compiled with your updates and got all sorts of errors from PACKER. Please let me know what's happening. Also, is there any particular day of the week or hour of the day when you come to PARC for meetings? 1

LPD 27-JUL-72 11:57 11160

Are you still modifying IMNLS?

(J11160) 27-JUL-72 11:57; Title: Author(s): L. Peter Deutsch/LPD;
Distribution: William S. Duvall/WSD; Sub-Collections: NIC; Clerk: LPD;

JRP 27-JUL-72 17:36 11161

status of ucsb to rand,i4-tenex,bbn file transfer program

bill, this is just a quick message to
test out the journal system and to inform
you of my program status.

the programs i advertised to you seem to be operational. i plan to give a more thorough documentation of the procedure to you using nls and journal. id like to know if you have opened batch and online accounts here yet. if so i need the numbers. i transferred a file(wpj3) to i4-tenex today with our more efficient mods. elapsed time was about 12 minutes and the cost here was 69 cents...about 1/20 cent per card.

by the way if youve had troubles getting on to ucsb, let me know. we've been up but the network seems to be having problems.

please return a message to me so that i can see the journal work.

ps. baby is near. mild contractions started today.

(try and show that message to your superiors)

j. pickens

1

JRP 27-JUL-72 17:36 11161
status of ucsb to rand,i4-tenex,bbn file transfer program

(J11161) 27-JUL-72 17:36; Title: Author(s): John R. Pickens/JRP; Distribution: William P. Jones/WPJ; Sub-Collections: NIC; Clerk: JRP;

JBL 28-JUL-72 10:07 11172

Factorial 10000 complete

Don: Wally Weiner and I successfully computed 10,000 factorial on the BBN-TENEX using LOGO. The file I have compares correctly on spot checks with your door. I have formatted it prettily. If you wish to have it again you will find it as a simple string of digits on BBN:<LEVIN>FACTORIAL.10000. A version nicely formatted with commas and CR's is in BBN:<LEVIN>TEN-THOUSAND.FACTORIAL. On a nearly empty machine it took about 31:15 of cpu in about 45 minutes of connect. Wally and I figure that, given a constant multiply time, these times are independent of the algorithm. Pax 1

JBL 28-JUL-72 10:07 11172

Factorial 10000 complete

(J11172) 28-JUL-72 10:07; Title: Author(s): Joel B. Levin/JBL;
Distribution: Donald C. Wallace/DCW; Sub-Collections: NIC; Clerk: JBL;

REQUEST FOR PROPOSAL: NLS NETWORK SERVICE FACILITY

Gentlemen: 1

This is a Request for Proposal on facilities management of an "NLS Network Service Facility," consisting of a PDP-10 TENEX timesharing system connected through a TIP or an IMP to the ARPANET. The purpose is to support SRI-ARC in providing special timesharing computer services to the ARPA Network user community. (SRI-ARC is the Augmentation Research Center of Stanford Research Institute.) By "facilities management" we mean the procurement, operation, and maintenance of a computer hardware and software system, including such supporting functions as archival data storage and retrieval, output processing and report distribution, and user accounting and interfacing. These concepts are defined in the text that follows. 2

3

INTRODUCTION 4

Price Quotation 5

Your price quotation should address these three main aspects of facilities management: 6

(1) Basic system and support requirements 6a

(2) Expansion possibilities 6b

(3) Contingency and miscellaneous events. 6c

In addressing these three aspects, the quotation should indicate which items are critical in any sense, e.g., long lead time to procure, difficult to provide desired service levels, etc. The "Statement of Work" section covers the above three categories in more detail. 7

Note that while the Statement of Work describes the type of facilities management operations we envision, we will also entertain proposals that deviate from our specifications. All items are to be construed as indications of SRI-ARC expectations, not as binding constraints that must be agreed to in your reply to this request. We will consider awarding a contract based on specifications different from those we describe, provided that our end goals are met and that costs and other factors are in line with our expectations. 7a

The quotation will be evaluated by SRI-ARC according to the following criteria: 7t

Qualifications of
Personnel
Facilities management company. 7b1

Facilities
Type of equipment
Location of equipment
Capability for future expansion
Location of personnel. 7b2

Ability to meet schedule 7b3

Cost and/or price 7b4

The quotation must include certain details of personnel experience, location of equipment and personnel, etc. These are enumerated in the "Facilities Management Criteria" and "Miscellaneous Requirements" sections. 8

If any proposal/offer contains proprietary information it should be appropriately identified and marked, and permission be given both to SRI-ARC and to the U.S. government to use such information for evaluation purposes in considering the offeror's proposal. Explicit permission to incorporate offeror's proposal into and as a part of SRI-ARC's proposal to the U.S. government for a prime contract will be required. 9

Contract Considerations 10

Because of budgeting and timing constraints, we request that the price quotation be available to us by October 2, 1972, and be valid until March 15, 1973. 11

We anticipate that a fixed-price subcontract, under a U.S. government prime contract, will be negotiated for a one-year facilities management arrangement to commence about March 1, 1973. (Other proposed forms of subcontract may be considered.) Please indicate in your reply whether or not you can meet our intended start date of March 1, 1973, and if not then indicate what start date you could meet. 12

We expect that the contract negotiation period will begin about November 1, 1972. However, we must emphasize that at the present time we have no funds to negotiate a contract. Your reply to this request will be the basis for our making proposals to acquire the necessary funds. We make no guarantee that any contract will be awarded. 13

SRI-ARC may elect to prenegotiate a contract with a selected, qualified vendor before receipt of a formal prime contract from the government, to expedite and facilitate commencement of the proposed requested services. Prenegotiation of a contract would not incur any cost obligation on the part of SRI-ARC. 13a

If, to meet the agreed on start date, it becomes necessary to order equipment before a contract go-ahead, such would be solely at the vendor's risk. 13b

If it becomes feasible to negotiate a two-year contract rather than a one-year contract, or if it becomes possible to renegotiate the one-year contract into a contract lasting more than one year, then we would like to consider doing this. Therefore, we would like your quotation to include any information (such as pricing changes, dates by which you would have to know of the altered plans, etc.) that would affect or be influenced by these possibilities. 14

STATEMENT OF WORK 15

Specific requirements concerning the above three main aspects of the facilities management concept will now be considered. 16

(1) Basic system and support requirements 17

Hardware Configuration 17a

The hardware system is a 128K PDP-10 computer system, with pager, swapping drum, disk storage, associated peripheral devices, and interfaces to accommodate local terminals and terminals on the ARPANET. 17a1

A list of hardware components necessary to support about 20 simultaneous users (out of a community of about 200 users) under the TENEX timesharing system is given in the attachment (Figure 1). 17a2

A proposed configuration that provides the equivalent or better functions and service levels to that shown in the attachment will not disqualify an offeror from being selected for the facilities management contract. 17a3

Hardware Procurement, Installation, and Maintenance 17b

We expect you to manage the procurement, installation, and maintenance of the hardware required for our needs. In the configuration of Figure 1 certain special equipment is indicated. This is the following: 17b1

The BBN "pager" and associated arithmetic processor modifications to the PDP-10 computer. 17b1a

The interface message processor (IMP), and phone lines to allow tie-in to the ARPA Network. 17b1b

The interface hardware to connect the IMP to the PDP-10. 17b1c

Please note the following: 17b2

The IMP will have to be acquired through the Advanced Research Projects Agency, ARPA. The BBN pager, the arithmetic processor modifications, and the IMP interface hardware probably will have to be acquired from BBN. 17b2a

Certain software aspects of TENEX (especially the Network Control Program) are implemented to use these special pieces of hardware. Any deviations from the existing hardware would require software modifications. 17b2b

Other considerations: 17b3

Availability and cost of floor space, air conditioning requirements, and similar installation factors and costs should be stated in your quotation. 17b3a

Please indicate in your Proposal whether you intend to operate more than one PDP-10 TENEX timesharing system as part of your overall installation. We would expect that your ability to provide a reliable system would be enhanced if more than one such system were being operated by your personnel. 17b3b

Software Procurement and Maintenance 17c

TENEX Timesharing System 17c1

The TENEX timesharing system software will be government furnished. Some initial modifications to the standard BBN TENEX software are required for the processing of the SRI-ARC on-line system software, "NLS". SRI-ARC would assist you in making the initial installation and initial modifications as necessary. 17c1a

Following installation, all subsequent BBN releases of the TENEX software are to be installed on receipt. For each such new release, installation may require that previous SRI-ARC modifications to TENEX, and/or previous modifications made by you the facilities management company, would have to be installed in the new release, possibly with SRI-ARC assistance. 17c1b

NLS (SRI-ARC's On-Line Interactive System) 17c2

The NLS system is to be provided and installed by SRI-ARC as a subsystem under TENEX. Maintenance and upgrading will be the responsibility of SRI-ARC. The NLS system is not to be copied, duplicated, or put to any use other than that prescribed herein for the purposes of facilities management for SRI-ARC. 17c2a

TENEX Subsystems 17c3

Only a subset of the whole set of available TENEX subsystems will be installed. Those subsystems to be installed will be described at the time the contract is negotiated. The facilities management company will not be expected to provide maintenance on any of the subsystems. Maintenance could be provided by BEN, by DEC, or by SRI-ARC. 17c3a

Supporting Functions 17d

Computer Operations 17d1

Six days per week, Monday through Saturday. 17d1a

Two shifts per day, covering 5 AM to 9 PM Pacific time. 17d1b

Archival Data Storage and Retrieval 17d2

By archival storage is meant storage on magnetic tape or other tertiary storage medium, usually an off-line medium. 17d2a

The TENEX system has facilities to allow the operator to cause selected files to be archived automatically. This function will have to be performed weekly. 17d2b

An archived file should be able to be placed in the on-line storage medium, on user request to the facilities management operator, within a period of time not longer than one hour and preferably as short as 10 to 15 minutes after the user request is received. 17d2c

Output Processing and Report Distribution 17d3

Printer output, generated by SRI-ARC supported software, will have to be mailed to users at their request, sometimes with multiple copies (not carbon, but repeated). In some special cases, blocks of such output would be transmitted directly to SRI-ARC for further processing. (SRI-ARC would provide address information; the printouts could be addressed automatically; the type of paper would be specified by the user.) 17d3a

Accounting for Resources Used 17d4

A detailed monthly report, by account number and user name, is to be provided to SRI-ARC. Standard TENEX accounting routines may be used for this purpose. 17d4a

User Interfacing 17d5

An operator must be available to answer requests for general (beginner-level) information about use of the TENEX timesharing system. (A manual on TENEX usage exists and would be available to the facilities management company.) 17d5a

The requests that can be anticipated will concern file status, output status, system availability, storage space allotments, and the like. 17d5b

Training of users is neither required nor expected of the facilities management team. 17d5c

(2) Expansion possibilities 18

We consider that the capacity or capabilities of the initial configuration will have to be improved (upgraded) from time to time, though not frequently, to enhance services to users. Some of the areas and capabilities that we anticipate will require upgrading are listed below. Please indicate any difficulties you foresee in such upgrading, and by what increments in cost and capability such upgrading could be attained. 18a

Central processor and main memory:
- core size
- core speed
- number of processors. 18a1

Swapping drum:
- capacity
- bandwidth. 18a2

On-line file storage:
- capacity
- average access time
- transmission rate. 18a3

Archival (off-line) file storage:
- capacity
- density
- average time to move a file from off- to on-line storage. 18a4

Low-speed communications:
- eight-level serial teletype code
- up to about 64 lines on-line from any point in the U.S.
- speeds up to 2400 bits per second. 18a5

Operator service and/or support:
- type and level of service/support provided. 18a6

Another possible mode of expansion is to add different types of equipment, such as computer output to microfilm. We recognize that these types of equipment will have to be specified by us at the time they are desired, and that no quotation can be made by you at this time. However, we would like your comments on this if you foresee any difficulty in making such additions (for example, whether you would be willing to make any necessary software additions to accommodate the new equipment). 18b

(3) Contingency and miscellaneous events 19

In considering the requirements for facilities management as described above, it is clear that certain contingencies and other events may occur at unpredictable times. We will expect that mutually acceptable conditions will be included in the contract for facilities management to cover these events. 19a

Those events that can be anticipated are listed below. With each event is a preliminary statement of how we currently would prefer to handle it. This is subject to further modification by SRI-ARC, and to negotiation with the selected facilities management company. 19b

Your comments on these procedures should be included in your reply to this request. Comments should include what procedures you would propose instead of, or in addition to, those we are proposing. 19c

(a) Contingencies 19c

Failure to Meet Agreed-on Start Date 19d1

"Meeting the start date" means that, commencing with the agreed-on start date, the computer system and all supporting functions are "fully operational and usable" in prescribed fashion through the ARPANET at least 90 percent of the time during the first six consecutive days of operations, with no more than three "crashes" during that period. 19d1a

"Crash" means that the computer system is down and inaccessible from ARPANET terminals. (However, if only the IMP is down and everything else is operational and usable, then the system will not be considered down.) 19d1a1

If any file is lost or damaged as a result of hardware malfunction or operator error, the computer system will be considered to be not fully operational and usable commencing with that shift in which the problem was detected, and continuing until the problem is corrected. (A "shift" is either of the two periods (1) 5 AM to 1 PM, and (2) 1 PM to 9 PM, Pacific time.) 19d1a2

Failure to meet the start date would result in total nonpayment by SRI-ARC until such time that the system and all supporting functions are "fully operational and usable", as defined above, for one period of six consecutive days. The beginning of that period would be the effective start date of the contract, and payments by SRI-ARC would be based on that date. 19d1b

If the effective start date occurs later than three months after the originally agreed-on start date, then renegotiation of the contract may occur. 19d1c

Downtime After System Becomes Operational 19d2

The computer system will be considered "down" if, in any week during which normal operations are expected, the system and all supporting functions are not "fully operational and usable" (as defined above in terms of percent up-time, number of crashes, and files lost or damaged). 19d2a

Payments by SRI-ARC would cease commencing with the time at which the computer went "down". 19d2b

Payments would be resumed after one period of eight consecutive hours of up-time is experienced. 19d2c

Note that the intent of this definition of downtime is as follows: The frequency of crashes as well as their duration are both important factors. One crash per hour resulting in less than 10 percent downtime will not be tolerable. We can, however, tolerate a bad day, i.e., two or three crashes in one day, provided this happens no more than once per week. 19d2d

Lost or Damaged Files 19d3

Accounting for file storage charges incurred by a user from the point in time that a file is damaged or lost to the point in time that the latest intact version of it is restored should be credited to that user's account. 19d3a

Recovery of the latest intact version of a damaged or lost file should be accomplished within the four-hour period from the time of notification to the facilities management team. 19d3b

The utility operation of saving the changed files of the on-line file storage medium by dumping them onto an off-line, tertiary (back-up) storage medium such as magnetic tape must be done at least once per day. (This is not the same funtion as "archiving", described above, archiving being permanent tertiary storage of selected files). 19d3c

Files thus dumped must be saved on a systematic cyclic retention basis, which we suggest should be the following: 19d3c1

Dump changed files once per day and save those of the most recent six days. 19d3c2

Dump all files once per week and save those of the most recent four weeks. 19d3c3

Dump all files once per month and save those of the most recent three months. 19d3c4

Failure to Perform to Specifications 19d4

Failure to perform to specifications over some extended period of time (currently anticipated as one month) would result in termination of the facilities management contract at SRI-ARC option, with no cost to SRI-ARC other than that due for the services provided during the time the contract was in force. 19d4a

(b) Miscellaneous 19e

Use by the facilities management company of the SRI-ARC computer system, for educational purposes, testing, or any other reason: 19e1

SRI-ARC has a running version of essentially the same computer system as that shown in Figure 1. It is possible that the facilities management team may want to use the SRI-ARC system for any number of purposes. 19e1a

SRI-ARC would negotiate this separately from the facilities management contract. 19e1b

Use of SRI-ARC expertise by the facilities management company for purposes of training its own personnel: 19e2

If such training is desired, please indicate this in your reply to this request. 19e2a

Indicate the type of training (e.g., TENEX systems software, NLS systems software, TENEX user facilities, NLS user facilities, PDP-10 computer operations, etc.), the number of personnel to be trained, and the previous experience of these personnel in the areas where training is desired. 19e2b

Addition of users other than those authorized by SRI-ARC: 19e3

If it becomes possible for the facilities management team to provide service from the same computer system that is operated for SRI-ARC to users other than those authorized by SRI-ARC, this would be subject to negotiation with SRI-ARC. 19e3a

It is expected that in such an event the facilities management contract would be modified to show decreased costs to SRI-ARC resulting from the compensating revenue gained by the facilities management company from the new users. 19e3b

FACILITIES MANAGEMENT CRITERIA 20

We anticipate that the services provided by the facilities management team will meet certain criteria, as outlined below. We would like your response to indicate whether you can meet these criteria, and if not what deviations you would like us to consider. 21

Equipment 21a

The computer equipment must be capable of providing services and functions equivalent to that provided by the equipment listed in Figure 1 (see attachment). 21a1

Location 21b

The location of the computer equipment is not of paramount importance, but it is desirable that it be accessible through local phone calls from SRI-ARC (i.e., it would be either located within the San Francisco Bay Area, or accessible via a data concentrator located in that area). 21b1

It is necessary that there be located within the San Francisco Bay Area a staff of qualified persons from the facilities management company with whom SRI-ARC could discuss technical and administrative aspects of the facilities management arrangement, both during the contract negotiation stages and throughout the life of the contract. 21b2

Experience of Facilities Management Company 21c

We require that the facilities management company we select shall have had experience in providing timesharing service on a commercial, competitive basis for at least two years. 21c1

Experience of Personnel 21d

We expect there will be two different types of staffing requirements on the facilities management team: systems programming, and computer operations. 21d1

These positions should be filled by persons with experience appropriate to the level of the work required. 21d2

Such experience levels should be no less than the following: 21d3

Systems Programming: two years experience with commercial timesharing systems. 21d3a

Computer operations: one year experience with commercial timesharing operations. 21d3b

MISCELLANEOUS REQUIREMENTS 22

Cost Breakdown 22a

We ask that you detail your expected costs on the attached DD Form 633, as applicable. This is required to facilitate possible future government audit. 22a1

Indicate what overhead rates (and their basis) that you have used for calculating the charges to us of the personnel who will be running the system. 22a1a

Financial Statement 22b

Include the most recent financial statement of your company (your 1971 Annual Report will be sufficient). 22b1

Representative List of Contracts for Similar Services 22c

With your reply to this request, we would like you to include a representative list of other recent or ongoing contracts (both government and commercial) under which you provide services similar to those we have described in this document. 22c1

We would like documentation on the type of service, the duration of the contract, the name of the contractor, and the dollar volume to be included with each contract on this list. 22c2

23

ATTACHMENT. Figure 1: Hardware Configuration

Unless otherwise noted, all components listed below are those of Digital Equipment Corporation for the PDP-10 computer system. General characteristics of the principal devices listed below are included in the next subsection of this attachment. Components that provide equivalent or better functions and service levels will be considered in evaluating proposals.

Computer system:
- one KA10 Arithmetic Processor
- one BBN "pager" and associated arithmetic processor mods
- 128K words (eight modules) ME10 core memory
- one DK10 addressable clock.

Swapping drum:
- one DF10 data channel
- one RC10 swapping drum control unit
- one RM10B swapping drum.

Disk storage:
- one DF10 data channel
- one RP10C disk control unit
- two RP03 disk drives (one is a spare).

Magnetic tape:
- one TM10A magnetic tape control unit
- two TU41 magnetic tape drives (one is a spare).

Terminal interfaces:
- one BBN IMP (interface message processor)
- one IMP interface.

Printer:
- one upper/lower case buffered line printer (of the quality of a Data Products Line Printer Model 4500)

The principal devices listed above have the following general characteristics:

KA10 processor:
- 10 character per second console teleprinter
- 366 instructions, including floating point and byte manipulating instructions
- multiplexed input/output processor with seven levels of priority interrupt.

ME10 core:
    16,384 36-bit words per module
    1.0 microsec cycle time
    up to four memory access ports
    four-way interleaving and instruction look-ahead. 26b

RM10B swapping drum:
    345,600 36-bit words of storage
     (90 tracks, 60 sectors per track, 64 words per sector)
    8.5 millisec latency
    4.3 microsec per word transfer rate. 26c

RP03 disk drive:
    up to 10,240,000 36-bit words of storage
    400 cylinders
    30.0 millisec avg seek time
    12.5 millisec latency
    15 microsec per word transfer rate. 26d

TU41 tape:
    7 channels
    200, 556, and 800 bpi density
    120,000 characters per second. 26e

Data Products Model 4500 Line Printer:
   132 characters per line
   600 lines per minute
   96 printing characters, including:
      blank
      upper and lower case alphabet
      numerals 0, 1, ..., 9
      special characters:
           " # $ % & @ ↑ ← '
        * = + - ( ) [ ] < >
        : ; , . ? / 26f

Michael D. Kudlick
Stanford Research Institute
Augmentation Research Center
333 Ravenswood Avenue
Menlo Park, California 94025

To:
Michael D. Kudlick
Stanford Research Institute
Augmentation Research Center
333 Ravenswood Avenue
Menlo Park, California 94025

11174

Author Copy

TRANSMITTAL LETTER: NLS NETWORK SERVICE FACILITY

(J11174) 28-JUL-72 11:25; Title: Author(s): Michael D. Kudlick/MDK; Distribution: Kirk E. Kelley, N. Dean Meyer, Joy A. Glenn, Kay F. Byrd, Ralph Prather, James E. White, Augmentation Research Handbook, Jacques F. Vallee, Diane S. Kaye, Paul Rech, Michael D. Kudlick, Don Limuti, William R. Ferguson, Linda L. Lane, Marilyn F. Auerbach, Walt Bass, Douglas C. Engelbart, Beauregard A. Hardeman, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Mil E. Jernigan, Harvey G. Lehtman, Jeanne B. North, James C. Norton, Cindy Page, William H. Paxton, Jeffrey C. Peters, Jake Ratliff, Barbara E. Row, Ed K. Van De Riet, Dirk H. van Nouhuys, Kenneth E. Victor, Donald C. Wallace, Richard W. Watson, Don I. Andrews/SRI-ARC; Sub-Collections: SRI-ARC; Clerk: MDK;
Origin: <KUDLICK>RPQXMTL.NLS;16, 28-JUL-72 11:23 MDK ;

TRANSMITTAL LETTER: NLS NETWORK SERVICE FACILITY

To: (Prospective Offeror)

From: G.C. Kasolas, Contract Administrator

Subject: (RFP No.)

Gentlemen:

Stanford Research Institute invites you to submit a proposal on Facilities Management of the "NLS Network Service Facility," as set forth in the attached Request for Proposal.

Your submittal should arrive at SRI by October 2, 1972, and be addressed to:

Stanford Research Institute
333 Ravenswood Avenue
Menlo Park, Calfornia 94025
Attention: Mr. G.C. Kasolas
Contract Administrator

Three copies of your submittal are requested, each of which should contain all of the elements of cost in detail necessary in your opinion to perform the effort contemplated. Performance of the effort, period of performance, and type of contract will be in accordance with and as indicated in the attached RFP.

This request does not commit SRI or the government to pay any costs incurred in the submission of the proposal, or to procure or subcontract for services or supplies in connection with the submission of this proposal. Further, this Request for Proposal does not commit SRI or the government to any costs incurred in anticipation of a contract.

Your attention is invited to that section of the RFP which clearly states that it is SRI's intent to incorporate prospective offeror's proposal within and as a part of an SRI proposal for a prime contract with the U.S. government. Accordingly, appropriate permission will be required.

You are invited to attend a meeting at SRI on Friday, September 8, 1972, to discuss this RFP. Dr. Douglas C. Engelbart and other members of the SRI staff will be present to answer any technical and administrative questions you may have about the RFP at that time. Notification is to be given to SRI within 7 days following that meeting indicating your intent to bid. If a proposal is not to be submitted, the attached RFP is to be returned to SRI.

TRANSMITTAL LETTER: NLS NETWORK SERVICE FACILITY

Questions concerning any aspects of the RFP may be addressed to Dr. Engelbart or the undersigned, by mail or phone (415) 326-6200. Replies will be by mail with copies to all prospective bidders. 11

12

Very truly yours,

G.C. Kasolas
Contract Administrator 13

REQUEST FOR PROPOSAL: NLS NETWORK SERVICE FACILITY

(J11173) 28-JUL-72 11:19; Title: Author(s): Michael D. Kudlick/MDK; Distribution: Kirk E. Kelley, N. Dean Meyer, Joy A. Glenn, Kay F. Byrd, Ralph Prather, James E. White, Augmentation Research Handbook, Jacques F. Vallee, Diane S. Kaye, Paul Rech, Michael D. Kudlick, Don Limuti, William R. Ferguson, Linda L. Lane, Marilyn F. Auerbach, Walt Bass, Douglas C. Engelbart, Beauregard A. Hardeman, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Mil E. Jernigan, Harvey G. Lehtman, Jeanne B. North, James C. Norton, Cindy Page, William H. Paxton, Jeffrey C. Peters, Jake Ratliff, Barbara E. Row, Ed K. Van De Riet, Dirk H. van Nouhuys, Kenneth E. Victor, Donald C. Wallace, Richard W. Watson, Don I. Andrews/SRI-ARC; Sub-Collections: SRI-ARC; Clerk: MDK;
Origin: <KUDLICK>RPQ.NLS;66, 28-JUL-72 11:15 MDK ;

TRANSMITTAL LETTER: NLS NETWORK SERVICE FACILITY

To: (Prospective Offeror)

From: G.C. Kasolas, Contract Administrator

Subject: (RFP No.)

Gentlemen:

Stanford Research Institute invites you to submit a proposal on Facilities Management of the "NLS Network Service Facility," as set forth in the attached Request for Proposal.

Your submittal should arrive at SRI by October 2, 1972, and be addressed to:

Stanford Research Institute
333 Ravenswood Avenue
Menlo Park, Calfornia 94025
Attention: Mr. G.C. Kasolas
Contract Administrator

Three copies of your submittal are requested, each of which should contain all of the elements of cost in detail necessary in your opinion to perform the effort contemplated. Performance of the effort, period of performance, and type of contract will be in accordance with and as indicated in the attached RFP.

This request does not commit SRI or the government to pay any costs incurred in the submission of the proposal, or to procure or subcontract for services or supplies in connection with the submission of this proposal. Further, this Request for Proposal does not commit SRI or the government to any costs incurred in anticipation of a contract.

Your attention is invited to that section of the RFP which clearly states that it is SRI's intent to incorporate prospective offeror's proposal within and as a part of an SRI proposal for a prime contract with the U.S. government. Accordingly, appropriate permission will be required.

You are invited to attend a meeting at SRI on Friday, September 8, 1972, to discuss this RFP. Dr. Douglas C. Engelbart and other members of the SRI staff will be present to answer any technical and administrative questions you may have about the RFP at that time. Notification is to be given to SRI within 7 days following that meeting indicating your intent to bid. If a proposal is not to be submitted, the attached RFP is to be returned to SRI.

TRANSMITTAL LETTER: NLS NETWORK SERVICE FACILITY

Questions concerning any aspects of the RFP may be addressed to Dr. Engelbart or the undersigned, by mail or phone (415) 326-6200. Replies will be by mail with copies to all prospective bidders. 11

12

Very truly yours,

G.C. Kasolas
Contract Administrator 13

TRANSMITTAL LETTER: NLS NETWORK SERVICE FACILITY

(J11174) 28-JUL-72 11:25; Title: Author(s): Michael D. Kudlick/MDK; Distribution: Kirk E. Kelley, N. Dean Meyer, Joy A. Glenn, Kay F. Byrd, Ralph Prather, James E. White, Augmentation Research Handbook, Jacques F. Vallee, Diane S. Kaye, Paul Rech, Michael D. Kudlick, Don Limuti, William R. Ferguson, Linda L. Lane, Marilyn F. Auerbach, Walt Bass, Douglas C. Engelbart, Beauregard A. Hardeman, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Mil E. Jernigan, Harvey G. Lehtman, Jeanne B. North, James C. Norton, Cindy Page, William H. Paxton, Jeffrey C. Peters, Jake Ratliff, Barbara E. Row, Ed K. Van De Riet, Dirk H. van Nouhuys, Kenneth E. Victor, Donald C. Wallace, Richard W. Watson, Don I. Andrews/SRI-ARC; Sub-Collections: SRI-ARC; Clerk: MDK;
Origin: <KUDLICK>RPQXMTL.NLS;16, 28-JUL-72 11:23 MDK ;

IWC 28-JUL-72 11:52 11176

Comments on NLS

Please consider the following comments from a dedicated but somewhat exasperated NLS user:
(Note: somehow my entire message didn't make it into the journal when I tried last time. Here is everything again.) 1

I should like to suggest a directive for the output processor which causes the output device to halt after the printing of each page until a special "continue" (non-printing) character is input. The purpose of this is to enable bond paper (not on a continuous roll) to be used on a 2741 and other such terminals, and also to permit alignment ajdustments on printers (our printer, for example, introduces spurious blank lines randomly which eventually cause printing to run over the perforations at the bottom of a page). 1a

It would be extremely desireable to devise some method (procedural or by software) to keep messages from the SRI console operator from being printed while the output processor is in operation. I have had numerous "final" copies ruined in this way. 1b

What is the effect of typing a semicolon as the first statement after the NLS prompting asterisk? This happens accidently when a want to move the pointer to a literal in the text and I forget to type a blank first. I can't seem to recover from the error and have to go back to the executive and enter NLS freshly. 1c

I don't know what your up-time statistics look like, but the experience of this East-coast user has been uniformy lousy, I'm sorry to say. The system seems to sense when you have a demo or special need for a clean hard copy, and invariably chooses then to go down HELP 1d

IWC 28-JUL-72 11:52 11176

Comments on NLS

(J11176) 28-JUL-72 11:52; Title: Author(s): Ira W. Cotton/IWC; Distribution: Richard W. Watson, James E. White, Walt Bass, Richard W. Watson, James E. White, Walt Bass, Thomas N. Pyke/RWW JEW WLB RWW JEW WLB TNP; Sub-Collections: NIC; Clerk: IWC;

trial 2 at memo to jcrl

<BBN-NET>JCRL.NLS;8, 17-JUL-72 18:08 TRS ; 1

Hi,

1a

I hope you are all recovered and in good health again. I finally managed to get something into the NIC with the expectation it will get mailed to you and/or that you will see it next time you log in to the NIC.

1b

The overhead for learning to use NLS and the NIC was a good deal larger than I'd anticipated. It took me about 20 hours to read through the user guide (NIC 7590) and to play enough with the system to feel comfortable with it. Bob Kahn and Bob Thomas were both at SRI during the week of July 3, and they have brought back the good news that both a beginner version of the user guide and a simpler user interface for short messages are forthcoming.

1c

Bob Kahn is anxious to demonstrate the NIC to attendees of ICCC, so he is pushing for getting these simplifications implemented over the next few months.

1c1

My first impressions of using NLS/NIC relative to the speech project are that we should definitely begin to use the journal facilities of the NIC for sending memos, reports by mail to each other ASAP. However, I have mixed feelings about the value of having each site try to send messages to each other or try to use the NIC on-line given the current state of NIC service. I feel we would be better off implementing the file transfer protocol on each of our machines, and sending messages plus short correspondence to each other directly via this FTP route.

1d

Implementation of the file transfer and data transfer protocols would also be useful to accessing the Lincoln data base.

1d1

trial 2 at memo to jcrl

In its current status, the NIC does not appear to be well suited to any message handling requirements of the speech project . The current message entering procedures via NLS are cumbersome; especially when non-display terminals are utilized.

1d2

It is worth noting that IMLAC terminals can be converted to fairly reasonable NLS display terminals with the addition of a mouse and key set plus some software developed by peter deutsch and available from Xerox PARC. We are in the process of doing this conversion to our IMLAC here at BBN.

1d2a

The SRI-ARC Host, like most of the hosts on the ARPANET, is just not up to the level of reliability one needs for fast, guaranteed turn around for messages. If the NIC gets serviced by a commercial outfit (with expected higher service reliability as well as backup service.), the speed and guarantee requirements could be met but it's not clear that the necessary convenience for short messages would be there. This convenience would be offered by communicating all messages machine to machine via the file transfer protocol which would result in one's seeing all his messages on his local host machine. Each host would have to notify its users , on login, if they had some messages (The TENEX system already has this capability), and some conventions would have to be set up about naming message files and appending messages to such files consistent with the current ARPANET FTP protocol.

1d3

trial 2 at memo to jcrl

In order to get the ball rolling on the speech project's use of the
ARPANET, it seems appropriate for each speech
contractor to have a guy who is responsible for the
ARPANET/speech project co-ordination. (This is one of
the roles I play at BBN.) This co-ordination role would
consist, initially, of learning to use the NIC, getting people
geared up to sending reports around through the NIC, and being
responsible for implementation of the FTP on his localhost.

1e

I propose to help set this up by contacting each of the
contractors
and asking them to assign the ARPANET/speech
project co-ordination role to someone in their groups.
My opinion is this would be most effective if this is
done by personal visits to each site, and I would like some
inputs
from you about how to time this. If you'd like us to set up
this
network co-ordination prior to the Sept 25, 1972 SRI site
visit,
I should probably visit each of the 5 prime contractors prior
to
that time. I am planning to attend the Sept 25 site visit;so,
I could delay visiting each of the contractor's sites until
then
which would cause some further delay in using the ARPANET
but save some travel expenses.

1f

BBN is progressing on the approach of utilizing the digitizing
facilities of Lincoln Labs via the phone line/ARPANET
route we discussed. We expect to be sending bits back and
forth in
August (assuming the telephone company lives up to their
end of the bargain). I will keep you posted on our progress.

1g

I will log into the NIC periodically to see if you have
responded to this note.

1h

TRS 28-JUL-72 15:13 11177

trial 2 at memo to jcrl

(J11177) 28-JUL-72 15:13; Title: Author(s): Ted R. Strollo/TRS; Distribution: Robert H. Thomas, J. C. R. Licklider, Ted R. Strollo, Ted R. Strollo/RHT JCRL TRS TRS; Sub-Collections: NIC; Clerk: TRS;

JEW 30-JUL-72 13:24 11178

ICCC PEOPLE COMMITMENTS

This note is a re-write of one I sent out over a week ago, which seems to have gotten crunched in a system crash last week. If you got the first copy, ignore this one. --Jim 1

The following ICCC personnel commitments have been received: 2

Kahn and Thomas report that the following people will help: 2a

Mc Kenzie 2a1

Burchfiel 2a2

Plummer 2a3

Rettberg 2a4

Karp reports through the journal, see -- (KJOURNAL,11143,1) 2b

Dolan will help Cerf in setting up ICCC accounts 2c

Vezza says that MIT people are available, and that specific personnel assignments can be decided upon at the next XIC3 meeting 2d

Winett can provide some LL-67 resources, and will help at the conference itself, but probably not much before. 2e

Cerf has yet to be heard from. 2f

ICCC PEOPLE COMMITMENTS

(J11178) 30-JUL-72 13:24; Title: Author(s): James E. White/JEW; Distribution: William W. Plummer, Robert E. Kahn, Richard W. Watson, Peggy M. Karp, Robert H. Thomas, James E. White, Dr. Vinton G. Cerf, Robert M. Metcalfe, Albert Vezza, Diane C. Roberts, Alex A. McKenzie/xic3 ; Sub-Collections: SRI-ARC XIC3; Clerk: JEW; Origin: <WHITE>PEOPLE.NLS;2, 30-JUL-72 13:19 JEW ;

Is the Journal there? 1

(J11180) 31-JUL-72 11:00; Author(s): James E. White/JEW;
Distribution: James E. White/jew ; Sub-Collections: SRI-ARC; Clerk:
JEW;

JEW 31-JUL-72 11:06 11181

ICCC PERSONNEL COMMITMENTS

This is the third try for this one.

JEW 31-JUL-72 11:06 11181

ICCC PERSONNEL COMMITMENTS

This note is a re-write of one I sent out over a week ago, which seems to have gotten crunched in a system crash last week. If you got the first copy, ignore this one. --Jim 1

The following ICCC personnel commitments have been received: 2

Kahn and Thomas report that the following people will help: 2a

Mc Kenzie 2a1

Burchfiel 2a2

Plummer 2a3

Rettberg 2a4

Karp reports through the journal, see -- (KJOURNAL,11143,1) 2b

Dolan will help Cerf in setting up ICCC accounts 2c

Vezza says that MIT people are available, and that specific personnel assignments can be decided upon at the next XIC3 meeting 2d

Winett can provide some LL-67 resources, and will help at the conference itself, but probably not much before. 2e

Cerf has yet to be heard from. 2f

ICCC PERSONNEL COMMITMENTS

(J11181) 31-JUL-72 11:06; Title: Author(s): James E. White/JEW; Distribution: William W. Plummer, Robert E. Kahn, Richard W. Watson, Peggy M. Karp, Robert H. Thomas, James E. White, Dr. Vinton G. Cerf, Robert M. Metcalfe, Albert Vezza, Diane C. Roberts, Alex A. McKenzie/XIC3; Sub-Collections: SRI-ARC XIC3; Clerk: JEW; Origin: <WHITE>PEOPLE.NLS;2, 30-JUL-72 13:19 JEW ;

DVN 31-JUL-72 11:19 11182

Documentation Production and Control Support to RADC: A Meeting on Form Generation.

Attendees: Walter Bass, Dirk van Nouhuys, Duane Stone, and, later, Dean Meyer 1

Duane began by pointng out that a large part of their work involves filling out forms. 2

Off the top of his head, he estimated his section handles two to three hundred contracts which demand 10 to 15 forms each, ranging from 6 to 15 copies of each form. 2a

He would like to enter information into NLS in some structured way that would form a data base that he could later print with appropriate atomatic filters and spacing to fill out forms. 2b

He hopes for something similar to the report generator in, for example, Auerbach's DM1 system. 2c

We discussed first suitable printers. We pointed out that several 30-character-per-second devices are available that are designed to print out forms from computer sources. 3

Several such printers have special capabilities that suit them to form filling, such as the capacity to roll back the platen. 3a

In particularwe mentioned the machine manufactured by Diablo in Hayward, (415) 783-3910, which company was recently purchased by Xerox. 3b

Duane agreed to undertake at Rome the process of selection of such a machine and we agreed to review his specifications. 4

Walter for one wuld reviews the specs. 4a

It seems that when we(ARC + Rome) decide upon such a machine for an initial NLS form filling system, we will probably want to stick with it for a while, so it is an important decision. 4b

Walter sketched out an NLS file which would label information with keyes as do our present master catalog files. 5

The keys, however, would take the form of the English words describing the information. 5a

Many government forms identify the input in tiny letters below the blank line. In such cases the keys would be the labels on he forms. 5a1

Hopefully a typist could insert the information easilly following the key and later call an analyzer/formatter program to filter and reformat the information to fit specific forms, 5b

The same source fil would serve for more than one form in many cases by varying the analyser-formatter pattern. 5b1

It was not clear whether Walter imagined that the information would be entered by a special subcommand language like the Identfile subcommand language or simply by writing in a real file as one can write on the real Identfile. 6

Walter estimated that making such a system wouldtake him a month of working time. 7

Duane comment that estimate was an order of magnitude less than the time estimated to do similar things in other systems. Walter comment that the smaller job was the result of NLS' flexibility. 7a

We had some discussion of how people with programming abilities at Rome might be integrated into such an effort. 8

We agreed that it would be valuable to integrate them as much as possible because: 8a

a month of Walter's time is not available in the foreseeable future; 8a1

it would a valuable learning experience for them getting into L-10 programming; 8a2

they could make better use of a system they had helped build. 8a3

But we made no clear paln for integrating people from Rome into building the form generator. 8b

Everyone agreed that such a form filling system would be a good "product" to point to as an outcome of our contract with Rome. 8c

From this specific problem we went on to discuss various difficulties and possibilities of using the output processor over the Net and eventually drew in Dean to produce a set of directives that would make it possible to syncronize the paging and directives in output device teletype with letter headed paper

rolled into a Model 37 Telltype (i.e., get rid of the dashes, statement zero, and the page feed). 9

Dean had only limited success in trying to produce such directives. 9a

DVN 31-JUL-72 11:19 11182

Documentation Production and Control Support to RADC: A Meeting on Form Generation.

(J11182) 31-JUL-72 11:19; Title: Author(s): Dirk H. van Nouhuys/DVN; Distribution: Rome Air Development Center (ISIM), Walt Bass, Dirk H. van Nouhuys/RADC WLB DVN; Sub-Collections: RADC; Clerk: DVN;
Origin: <VANNOUHUYS>JMTG.NLS;4, 31-JUL-72 9:43 DVN ;

Baseline Record System: Cooperation with Rome, A Meeting 1

Attendees: JCN, CHI, DVN, DLS 2

July 18 3

This meeting mainly served to get people acquainted with one another's achievements and problems. It neither moved in a orderly way from subject to subject nor produced any any action items. 4

Duane began by asking whether there was a way to put the relative priority of tasks in our baseline record system. 5

We answered there wasn't but such a method had been proposed as a plan for the future (,8168,). 5a

We compared the scope of tasks as described in ARC's BRS and in typical RADC managment documents. 6

We discovered that whereas there are about 150 tasks in our baseline record system, many of them of the duration of a few weeks (that is about 5 tasks per person), at RADC there are about two tasks per person, the shortest is about 4 months, and most tasks have no definite end. 6a

Jim described our baseline record system in general to Duane, referred him to document, (auerbach,base,) for further description and showed him examples of various views we might print out from it. 7

For Duane it was important that a manager should be able to see where all the time of the people he is managing goes to. But we also agreed that if a management system was to be used and uesful it must provide people at all levels with some kind of information they need. 8

We discussed for some time reporting work hours. 9

We described our SRI timecards which seemed a little more useful toward answering (,8) above than those at RADC . 9a

The suggestion was made that at ARC time cards be passed out on Monday instead of Thursday so that people would have a chance to fill them out accurately without remembering events four or five days past. 9b

We have carried out the suggestions (Kjournal,11139,). 9b1

Jim said that he had made an online timecard. 9c

Charles suggested tha timecards be larger and have categories described in English instead of numbers. 9d

We looked at the matrix that Jim had developed of where people thought their time was going by percentages (journal,10716,). 9e

We agreed that the baseline management system would only be working well when sommebody sitting at a console could find out what someone else was doing more easily by looking at a file than by walking to his office and asking him. 10

We agreed that it would be nice if the basedata were in people's initial files rather than a central file, although problems of control of format and content were cited. 11

Charles said he was planning to write a blurb about how the baseline record system should look to the user, and some of his thoughts about how to make it work.. 12

We then came to the question of what should we do on the basis of this meeting. 13

I summarized Rome's position as follows: 13a

They could use our baseline record system as it is. 13a1

and/or 13a2

They could use the general features of NLS to help their program management. 13a3

They cannot at this time themselves make substantial changes in our baseline record system to suit their needs or make a new baseline record system in NLS because of their limited L-10 programming experience. 13a4

Someone at ARC could build or modify a BRS for them, but it would be a substantial commitment of our manpower. 13a5

We broke up with Jim and Duane going to a console for Duane to get hands-on experience with the baseline record system 14

Their session resulted in a test data file and a program file with representative Baseline Record System parameter settings for Duane to use at home. 14a

DVN 31-JUL-72 11:51 11183
Baseline Record System:A Meeting on Cooperation with RADC

(J11183) 31-JUL-72 11:51; Title: Author(s): Dirk H. van Nouhuys/DVN;
Distribution: Rome Air Development Center (ISIM), Charles H. Irby/RADC
CHI; Sub-Collections: SRI-ARC RADC; Clerk: DVN;
Origin: <VANNOUHUYS>JBASELINE.NLS;1, 31-JUL-72 11:47 DVN ;

DVN 31-JUL-72 12:09 11184

Continuing Efforts Following Duane Stones Visit of the Week of July 17

Baseline Record System 1

Duane is going to continue experimenting with our present Baseline Record System with the understanding that if he wants help in adapating it to his needs he will call for such help. 1a

See also (journal,11183,,) 1a1

It seems that the Idents of the workers for whom our Baseline Record System will provide all views maybe compiled in NLS. This attachment to NLS makes it impossible to print outas a group certain views of people working outside ARC . We discussed with Dave Hopper the possibilities of changing the Baseline Record System. He estimaed two man days and suggested some klugey procedures Duane could use to get the output he wants. Considering that there is a vague general intention to revise the Baseline Record System in a number of ways I think we ought not to spend the two man days just now. 1b

Form Generater (link,) 2

Duane is preparing a design specification for a form generator. 2a

See (journal,11182,) for the meeting which led t the form generator task. 2a1

I will ask Walter, Jim, and Charles at least to review this design, and then we will ask someone to build it. 2b

It appeared when Duane was here that Bill Duvall would be a likely builder because of load on our other programmers. But it turned out that except for work on bringing up the Rome Imlacs (below see--link,) Bill is booked up solid till December. 2c

There are some other possibilities. 2d

Contract Report 3

We estimated that we would have the second draft including revisions suggested by Duane in three weeks. (That is, at the end of the week of August 7.) 3a

Training 4

DNLS 4a

We anticipate someone from ARC going to Rome to help them get started in DNLS when their Imlacs are really up and going. 4a1

MFA appears the most likely candidate. 4a1a

Early September seems about the right time for such a training visist. 4a1b

DEX 4b

We agreed that the Romans could handle learning DEX-I without help other than the user guides and other user information we've sent them. 4b1

They may want some help when DEX-II becomes operational, but that is not certain and it is not clear exactly when DEX-II will become operational. 4b2

L-10 4c

I proposed and Duane seemed in general to agree that the people with programming experience at RADC should experiment with L-10 a little bit on the basis of the L-10 User Guide, and then should visit ARC for further training in writing the user programs. 4c1

It seems preferable for them to come here, both to pick up the general atmosphere and because they could learn various aspects of L-10 with economic use of specialists' time. 4c2

We agreed it would be best for them to learn L-10 as much as possible by participating in the construction of the report generator discussed above (journal,11182,). 4c3

Late September or early October seems a good time. 4c4

IMLACS 5

Duane and Bill Duvall met and agreed on a plan whereby Bill could help them get DNLS running on their Imlacs. 5a

User Statistics 6

Jim Bair asked for information about how much people use the system. We have been collecting this information intermittently but not doing much with it. If Jim wants old

statistics he should send a journal item specifying what he wants to Jim Norton (JCN). 6a

As it happens we are organizing ourselves to gather and use these statistics in a more regular manner. Beau Hardeman is going to be gathering them, and Paul Rech will be performing certain analyses. If Jim Bair wants us to supply him with particular statistics in the future, he should send a journal item to Beau (BAH) or to me (DVN) and we will work out a plan to get him the information he wants. 6b

ICCC 7

Duane agreed that it might be valuable for someone from Rome to go to Washington to participate some in the net exhibit at the ICCC onference in the week of October 24th. We also agreed that some cooperative work between someone in Washington and someone at Rome over the net would be a good example of augmented team interaction. 7a

DVN 31-JUL-72 12:09 11184

Continuing Efforts Following Duane Stones Visit of the Week of July 17

(J11184) 31-JUL-72 12:09; Title: Author(s): Dirk H. van Nouhuys/DVN; Distribution: Rome Air Development Center (ISIM), Charles H. Irby, Walt Bass, William S. Duvall, Dirk H. van Nouhuys, Marilyn F. Auerbach, Dirk H. van Nouhuys/RADC CHI WLB WSD DVN MFA DVN; Keywords: brs training L-10 Imlac ICCC; Sub-Collections: SRI-ARC RADC; Clerk: DVN;
Origin: <VANNOUHUYS>JRBRS.NLS;1, 31-JUL-72 12:02 DVN ;

JGM 31-JUL-72 14:14 11186

Catalogue of Known IMNLS Bugs.

It is hoped that this file (imlac,imnlsbugs,:) can be used as the primary means of communicating about the many IMNLS bugs and can aid in getting them fixed.

JGM 31-JUL-72 14:14 11186

Catalogue of Known IMNLS Bugs.

This file is intended to be the main channel of interaction (and hopefully action) in reporting bugs in IMNLS and the IMNLS/DNLS pair in general. In the branch (,bugs) are catalogued the description of the bugs; these descriptions each include 1

(a) the name of the reporter, the site at which the bug was experienced, and the date on which the bug was first reported, 1a

(b) a description of the circumstances surrounding the occurrence, including, if possible, protocals of the command sequences which revealed the bug, 1b

(c) any corroborating evidence from persons at other sites who have observed the same phenomenon, 1c

(d) the date on which the bug was fixed, and the name of the person responsible for the fix. It is assumed currently that individual sites are responsible for compiling and acquiring new versions of IMNLS. 1d

(bugs) 2

J. G. Mitchell, Xerox Palo Research Center, July 30, 1972. 2a

Sometimes when doing an Insert Statement which requires more than one line in the literal area, a line will grow longer than imnls is prepared to accept and the display list gets clobbered (along with parts of imnls itself frequently). The line is definitely longer in these cases than is normal and is past the point where NLS usually chooses to place the final word at the beginning of the next line. 2a1

J. G. Mitchell, Xerox Palo Research Center, July 30, 1972. 2b

If one uses a Goto Exec command to get a subsidiary process temporarily, and then does a Tenex QUIT command to get back to NLS, the viewspecs area will be left empty in the recreated display about 50% of the time. 2b1

J. G. Mitchell, Xerox Palo Research Center, July 30, 1972. 2c

After doing an Output Sequential Lower, imnls clobbers the display list about 70% of the time after the command feedback area has been reset to the command which was current before the Output Sequential, and after the file name area has been cleared. 2c1

J. G. Mitchell, Xerox Palo Research Center, July 31, 1972. 2d

Catalogue of Known IMNLS Bugs.

If the IMLAC has been specified to tenex as a non-processor display
e.g., by @PROCESSOR (DISPLAY) NO<CR>
and the software flip-flops numbers 2 and 7 have been correctly set, doing commands such as SYSTAT or DIR which send characters to the tty simulation at maximum rate often cause IMNLS to clobber itself, necessitating a reload of the IMLAC. 2d1

Catalogue of Known IMNLS Bugs.

(J11186) 31-JUL-72 14:14; Title: Author(s): James G. Mitchell/JGM; Distribution: Kenneth E. Victor, Butler W. Lampson, James G. Mitchell, Charles H. Irby, James C. Norton, Douglas C. Engelbart, William H. Paxton/KEV BWL JGM CHI JCN DCE WHP; Sub-Collections: NIC; Clerk: JGM; Origin: <IMLAC>IMNLSBUGS.NLS;4, 31-JUL-72 13:58 JGM ;

PMK 31-JUL-72 15:17 11187

Malfunction in the Journal System

RWW:
There seems to be a problem in the Journal system. I have received copies of messages in the mail but they have not appeared in either the ARPA or MITRE-TIP PMK.NLS file. On Friday, Barbara Row tried to send me a proposal but my NLS file was locked. HELP
Thanks,
Peggy

1

PMK 31-JUL-72 15:17 11187

Malfunction in the Journal System

(J11187) 31-JUL-72 15:17; Title: Author(s): Peggy M. Karp/PMK;
Distribution: Richard W. Watson/RWW; Sub-Collections: NIC; Clerk: PMK;

JCN 1-AUG-72 18:39 11188

New ARC Journal Indices are available online and in Hardcopy

There are new ARC Journal Indices now online and in hardcopy. 1

Journal number index (11162,:zxn) 1a

Journal author index (11163,:zxn) 1b

The Titleword Index is contained in two files due to size limitations. They are stored in <DOCUMENTATION> directory as shown below awaiting enough disk space to submit to the Journal. 1c

Journal titleword index A thru L
(documentation,j11164,:zxn) 1d

Journal titleword index M thru Z
(documentation,j11165,:zxn) 1e

JCN 1-AUG-72 18:39 11188
New ARC Journal Indices are available online and in Hardcopy

(J11188) 1-AUG-72 18:39; Title: Author(s): James C. Norton/JCN; Distribution: Kirk E. Kelley, N. Dean Meyer, Joy A. Glenn, Kay F. Byrd, Ralph Prather, James E. White, Augmentation Research Handbook, Jacques F. Vallee, Diane S. Kaye, Paul Rech, Michael D. Kudlick, Don Limuti, William R. Ferguson, Linda L. Lane, Marilyn F. Auerbach, Walt Bass, Douglas C. Engelbart, Beauregard A. Hardeman, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Mil E. Jernigan, Harvey G. Lehtman, Jeanne B. North, James C. Norton, Cindy Page, William H. Paxton, Jeffrey C. Peters, Jake Ratliff, Barbara E. Row, Ed K. Van De Riet, Dirk H. van Nouhuys, Kenneth E. Victor, Donald C. Wallace, Richard W. Watson, Don I. Andrews, Duane L. Stone/SRI-ARC DLS; Sub-Collections: SRI-ARC; Clerk: JCN;
Origin: <NORTON>BL.NLS;8, 1-AUG-72 18:38 JCN ;

an invitation

how would you like to have dinner with me? 1

an invitation

(J11190) 1-AUG-72 22:25; Title: Author(s): Angie Gaffney/AG;
Distribution: John McCarthy/JMC; Sub-Collections: NIC; Clerk: AG;

SPEECH DIGITIZATION BY LPC ESTIMATION TECHNIQUES

TOM MAGILL 1

I. INTRODUCTION 2

The increasing use of digital signaling has led to a renewed interest in digitizing voice signals. Previous approaches such as PCM which have yielded good quality have required excessive bit rates while those that required modest bit rates, such as vocoders, provided inadequate quality. Recently techniques based on adaptive estimation concepts (commonly called the linear predictive coefficient (LPC) approach) have yielded excellent quality at modest bit rates. However, to date the LPC approach has only been simulated on large general purpose computers at rates much slower than real time. 3

II. OBJECTIVE 4

Develop a practicable real-time voice digitization concept based on LPC estimation techniques that yields good voice quality at modest bit rates. 5

III. METHOD OF APPROACH 6

The method of approach to improving the performance of voice digitizers consists of concentrating the research effort on linear predictive encoding techniques. Specifically, six tasks have been identified for further study. Of these, the first three will be given greater emphasis since they appear to present the greater opportunity for significant performance improvement. However, it should be observed that the latter three are worthy of study and, as the research effort proceeds, may yield significant performance improvements. 7

A. Asynchronous Operation 7a

Research efforts on linear predictive encoding techniques, to date, have concentrated on synchronous type operation, e.g., synchronous with a 4800 Hz clock. However, there are several reasons for considering asynchronous operation. First, a growing number of modern communication systems, particularly digital data systems now operate in an asynchronous mode. Second, speech is asynchronous with respect to any system clock. Pitch synchronous analysis

procedures are very effective but are basically asynchronous since the pitch frequency is a continuously changing variable. An obvious savings can be achieved by accomodating an asynchronous source with an asynchronous system rather than requiring a conversion to a synchronous format. Third, pitch synchronous analysis should provide more accurate speech characterization. Fourth, since pitch synchronous synthesis is required, a pitch synchronous (system clock asynchronous) system can avoid the necessity of interpolation operations. Finally, asynchronous operation permits the possibility of not transmitting the pauses in conversation and utilizing other data compression approaches that are basically asynchronous in nature. It is proposed to investigate the feasibility of obtaining the above advantages with linear predictive encoding of speech signals and to assess the impact of asynchronous transmission on voice quality. 7a1

B. Error Signal Characterization 7b

To date, two different methods of characterizing the error signal (the difference between the predicted and actual values) have been employed. In the first method, the error signal is characterized at each time sample by one bit representing its polarity. The quantized error signal is transmitted and used to drive the synthesizer at the receiver. A potential advantage of this approach is that the synthesis procedure should maintain high quality performance even in the presence of audio background noise. The major disadvantage of the first approach is that the bit rate required to characterize the error signal is quite high, e.g., nominally 7200 baud. 7b1

With the second method, the error signal has its key features extracted such that a much lower bit rate is adequate to represent the error signal. These key features are: (1) voiced/unvoiced decision, (2) pitch frequency, and (3) power level. The disadvantage with this second method is that if errors are made in the feature extraction process serious degradation of performance will result. Unfortunately, it is relatively easy for these errors to result in the presence of common disturbances such as audio background noise, phone line signal distortion, and multiple speakers. Thus, a major goal in voice digitization research must be to investigate alternate methods of error signal characterization that permit low bit rates but are more immune to practical problems such as background noise. 7b2

As examples of some possible approaches consider the following concepts. First, one might compare the magnitude of the error signal with a threshold level. Those error samples that exceeded this level would be characterized by polarity, magnitude, and location. With this approach it is possible to represent multiple pitch pulses per analysis period and there is no chance of failure in pitch determination. As an alternate approach one might consider encoding the error signal by some form of extreme sampling. That is, the error signal would be encoded only if it represented a local maximum or minimum. Each of these approaches as well as others must be investigated with respect to their performance as a function of various parameters such as threshold level, quantization accuracy, and number of bits permitted for error signal characterization. 7b3

C. Process Modeling. 7c

Autoregressive models have been used to represent the voice process in the LPC approaches pursued to date. The advantage of an autoregressive model is that the desired parameters can be determined by solving a linear set of equations. The disadvantage is that the associated transfer function corresponds to an all-pole filter. Thus, zeros in the power spectrum cannot be precisely modeled but must be approximated by several poles. A performance degradation may result, particularly for nasals, and the dimension of the predictor (the number of samples stored) will be increased. 7c1

By using a mixed autoregressive-moving average model it is possible to represent zeros precisely. The disadvantage of this approach is that determination of the desired parameters is more complex than simply solving a set of linear equations. However, recently techniques have been developed for solving these nonlinear equations and it is necessary to determine the feasibility of using them for voice signals. Thus, it is proposed to investigate the computational feasibility and assess the voice quality associated with mixed autoregressive-moving average modes. 7c2

D. Simplification of the Gain Calculation 7d

The present techniques for evaluating the gain parameter require approximately 90% of the synthesizer computations. Of the gain parameter calculations roughly one half are

necessary for the output synthesis operation and the other half are used specifically for obtaining the correct power in the output signal. Thus, it might be possible to reduce the number of synthesizer computations by approximately 45%, if one could develop more efficient power setting algorithms. 7d1

By way of example, one approach recognizes that if the synthesizer were driven by the true error signal there would be no problem in selecting the gain, i.e., unity gain would suffice. However, the true error signal is not normally employed at the synthesizer and thus it is necessary to adjust the power level of the driving function. If the power level of the driving function were set equal to the power level of the error signal, then an approximate match between the true signal and the synthesizer output powers would result. While this matching would not be perfect as in the conventional approach, it nevertheless might be adequate to satisfy the listener. 7d2

The above approach or related ones only make sense if a computationally efficient method can be found for determining the power in the error signal. Fortunately, based on some fundamental results of least squares prediction theory, it is possible to simply evaluate the power in the error signal without expressly calculating the error signal itself. Thus, a very simple computational approach is available and the number of computations in the synthesizer can be reduced by approximately 45%. 7d3

It is proposed to investigate the above and other related approaches to reducing the number of computations in the synthesizer. Since these approaches will result in only an approximate power match, it will be necessary to assess their feasibility by voice quality listening tests. 7d4

E. Comparison of Toeplitz versus Non-Toeplitz Form Solutions 7e

Two basic approaches to the determination of the linear predictive coefficients (LPC) have been pursued. With one of these approaches, the matrix that must be inverted to determine the LPC's is assumed to be Toeplitz in form, i.e., the diagonals maintain constant value independent of the row. The advantages of this approach are that inversion of the matrix is computationally much simpler and that stability of the recursive filter is guaranteed. The disadvantages are: (1) the noise sensitivity of the matrix inversion routine is not well understood, and (2) the

waveform is not as well predicted as it is with the non-Toeplitz form solution. 7e1

With the non-Toeplitz form solution the matrix of covariance coefficients has variable entries along the diagonals. This occurs as a result of the least squares prediction error formulation of the problem over a finite block of data. The advantages of this approach are that an optimal waveform reconstruction process occurs and that the noise sensitivity of the matrix inversion routine is well known. The disadvantages are that the matrix inversion routine requires a substantial amount of computation and that the resulting recursive filter may be unstable. 7e2

Since both approaches have advantages and disadvantages, it is difficult to recommend one approach. In addition, there are several versions of each basic approach. Furthermore, the true performance measure of voice quality requires subjective listening. Thus, it is proposed to perform subjective listening tests of promising versions of both Toeplitz and non-Toeplitz type solutions. Particular attention will be devoted to the effect of asynchronous transmission on performance of both approaches. 7e3

F. Innovations Representation 7f

The innovations representation of random processes permits optimal filtering and prediction through the use of a causally invertible inverse filter. Thus, it offers a simple conceptual and computational approach to filtering problems. The innovations approach may be thought of as a generalization of the state-space (Kalman filter) approach to estimation of random processes. It is reasonable to expect that this generalized viewpoint may lead to a more useful model for representation of the voice waveform. Thus, it is proposed to investigate the ability of the innovation representation of a random process to yield a more useful model of voice signals. 7f1

G. Summary 7g

Major emphasis will be given to the first three tasks (A, B, and C) since these represent the most promising techniques for improving the performance of voice digitization techniques based on adaptive estimation concepts. At present the second three tasks (D, E, and F) appear to be of lesser promise and consequently will be

given considerably less emphasis. However, if the initial efforts on any of these items show particular promise, the concentration of effort will be appropriately redistributed. Of course, each of the tasks are closely related in several ways and these relations will be reflected in the performance of each task. 7g1

IV. STATEMENT OF WORK 8

SRI will provide the necessary engineering and clerical manhours and facilities to accomplish the following tasks. 8a

Task 1 8a1

Investigate the advantages and limitations associated with the operation of promising LPC digitization techniques in an asynchronous mode. 8a1a

Task 2 8a2

Investigate new approaches for characterizing the error signal which require modest bit rates and which offer improved performance in the presence of background noise and signal distortion. 8a2a

Task 3 8a3

Investigate the computational feasibility and voice quality performance associated with mixed autoregressive-moving average models (i.e., explicit inclusion of zeros) for voice signals. 8a3a

Task 4 8a4

Investigate by computer simulation the feasibility of significantly reducing the number of computations associated with determining the gain parameter at the synthesizer. 8a4a

Task 5 8a5

Investigate by computer simulation the comparative voice quality obtainable from approaches based on Toeplitz and non-Toeplitz forms. 8a5a

Task 6 8a6

Investigate the application of innovation representations to voice signal modeling with the goal

of simplifying computations and/or improving performance. 8a6a

LLL 1-AUG-72 23:41 11191

speech digitization by lpc estimation techniques

(J11191) 1-AUG-72 23:41; Title: Author(s): Linda L. Lane/LLL; Distribution: Peggy M. Karp/PMK; Sub-Collections: SRI-ARC; Clerk: LLL; Origin: <LANE>MAGILL.NLS;13, 28-JUL-72 1:24 LLL ;

MFA 2-AUG-72 9:39 11192

The first meeting of the PODAC planning group is scheduled for Thursday, August 3 at 1:30. Let me know if there are any problems with this date/time. Marilyn. 1

(J11192) 2-AUG-72 9:39; Author(s): Marilyn F. Auerbach/MFA; Distribution: Augmentation Research Handbook, Kirk E. Kelley, N. Dean Meyer, Kay F. Byrd, Ralph Prather, James E. White, Jacques F. Vallee, Diane S. Kaye, Paul Rech, Michael D. Kudlick, Don Limuti, William R. Ferguson, Linda L. Lane, Marilyn F. Auerbach, Walt Bass, Douglas C. Engelbart, Beauregard A. Hardeman, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Mil E. Jernigan, Harvey G. Lehtman, Jeanne B. North, James C. Norton, Cindy Page, William H. Paxton, Jeffrey C. Peters, Jake Ratliff, Barbara E. Row, Ed K. Van De Riet, Dirk H. van Nouhuys, Kenneth E. Victor, Donald C. Wallace, Richard W. Watson, Don I. Andrews/SRI-ARC; Sub-Collections: SRI-ARC; Clerk: MFA;