BBN   IMP #5
Research Computer Center (RCC)   Host #0
PDP-10   1

I.   Personnel   2

All of the following individuals may be contacted by telephone
at (617) 491-1850, plus the extensions listed. Mailing
address is:

                                                                      2a

    Bolt Beranek and Newman
    50 Moulton Street
    Cambridge, Massachusetts 02138   2a1

A.   Administrator: Steve Chipman   ext. 358   2b

B.   Software: Ray Tomlinson   ext. 363   2c

C.   Hardware: Mac McKinley   ext. 383   2d

D.   NIC Station Agent: Steve Chipman   ext. 358   2e

E.   NIC Technical Liaison: Dan Murphy   ext. 361   2f

F.   Operator: Steve Chipman   ext. 358   2g

     Operator's night number is (617) 491-1869   2g1

II. Installation Type   3

The installation includes both Research and Service features.
Programs run under the TENEX operating system, which provides
a 256K word virtual address space to each process. Other
features of TENEX include a hierarchical process structure for
each uses, extensive file system capabilities, and a well
human-engineered executive command language.   3a

III. Equipment   4

A.   The primary computer at site is a PDP-10 with a memory
size of 80K 36-bit words. Also included is a hardware "pager"
which allows user access to a virtual memory of 256K for each
process.   4a

B.   Peripheral equipment (see also the hardware diagram)
includes: 4b

     1.   Paging drum of 1.56 million words with an average
     access time of about 16.7 milliseconds   4b1

2. Bryant disc file - 50 million words   4b2

3. A 64-line teletype scanner   4b3

4. Two magnetic tape drives (7-track tape, 200/556/800
bpi)   4b4

5. Two DEC tape drives   4b5

6. Paper tape reader and punch   4b6

7. Line printer (132 columns, 1200 lines/minute)   4b7

8. An Evans and Sutherland LDS-1 display system   4b8

IV. Consoles   5

The system currently handles three types of typewriter-like
consoles, all functionally identical and therefore listed
together.   5a

A. Teletype Models 33, 35, and 37   5a1

B. Character encoding is 7-bit USASCII. On input, the
eighth bit is ignored, on output it is always set to zero.
Unless the system is otherwise informed via Executive
Language commands (see item IX) it assumes the absence of
tabs, formfeed, and lower case text capabilities.   5a2

(See NIC #6811) for diagram of Research Computer Center .   5a3

C. The system is capable of interacting with both
half-duplex and full-duplex consoles. For network
interaction, transmission will be treated as half-duplex
unless the system is advised otherwise via an Executive
Language command (see item IX). (For local users,
full-duplex operation is the default made.)   5a4

D. In either half-duplex or full-duplex operation the
system always returns a CR (carriage return-hexidecimal 0D)
after receiving a LF (line feed-hexidecimal 0A); in
full-duplex mode the LF is also returned. Also, in some
cases ESC (hexidecimal 1B) is echoed as $ (hexidecimal 24)
rather than ESC.   5a5

E. The "attention-getting" character is ETX (frequently
called control-C, hexidecimal 03).   5a6

V. Physical Resources   6

3

A. Network users and local users will compete for use of the
resources of the system; therefore, network use will be
dynamically limited. However, an absolute upper bound of 16
users from the network will always apply. Usual peak local
usage is centered around 10:30 AM and 3 PM local time (EST or
EDT) on weekdays. The center is always open.   6a

B. Initial experimental network use of the Research Computer
Center can be charged to a special ARPA account; see item VII
for more details. Other usage may be arranged with the RCC
administrator and will be charged for at the then current
"government" rate.   6b

C. The system's network buffering permits every user to
transmit maximum-length messages (8095 bits).   6c

D. Long-term on-line storage is available to network users on
magnetic disc. (The disc storage is backed up by daily tape
dumps, but off-line magnetic tape storage is not available to
users.) A total of about 5 million 36-bit words of storage
will be available. Text is normally packed 5 7-bit characters
per storage word. The rate structure described in paragraph B
above will also apply to long term storage.   6d

VI. Interests and Capabilities   7

BBN is a research, development, and consulting company with a
significant emphasis on the development and use of computer
systems. Principal projects and services of the Research
Computer Center include: 7a

A. The TENEX operating system itself. As mentioned in
item II, TENEX provides each user process with a 256K word
virtual address space a well human-engineered executive
command language, and many other features. Network
consultant for the TENEX system is Dan Murphy (ext. 361)
(BBN telephone number for all extensions is (617) 491-1850;
mailing address for all personnel mentioned is Bolt Beranek
and Newman, 50 Moulton Street, Cambridge, Mass., 02138).   7a1

B. BBN LISP is an implementation of LISP (a list
processing language useful for symbol manipulation) which
features extensive interactive debugging aids and a very
large address space. Principal consultant on the LISP
system is Warren Teitelman (ext. 357).   7a2

C. Another large-scale effort is devoted to natural
language processing. Program development includes an
English-language parser and a semantic analyzer.

Information on the progress of this work can be obtained
from Bill Woods (ext. 348).   7a3

D. BBN has connected an Evans & Sutherland LDS-1 display
system to the PDP-10 and plans to use this to offer a
"clipping" service to the network. A user may specify a
large picture, a small window, and specify location of the
window over a portion of the picture. THe hardware will
return to the user that portion of the picture which can be
seen through the window. Further information can be
obtaied from Elaine Thomas (ext. 439).   7a4

VII. Login   8

The login procedure for TENEX is outlind below. Character
strings are understood to be 8-bit USASCII codes (see item
IV.B). Characters transmitted by the user are underlined;
each user transmission should be terminated by the ESC
character (hexidecimal 1B).   8a

The first character to be transmitted over the connection from
the BBN system will be a zero which should be ignored. The
system will then transmit @.   8b

The first character to be transmitted over the connection by
the user will be presumed to be a zero and will be ignored by
the system. The following dialog should then take place.   8c

LOGIN   (USER)   user name
(PASSWORD)
password (the system will overprint this line first)
(ACCOUNT) account name   8c1

Following "account name" the user should transmit a CR
(hexidecimal OD) rather than ESC.   8d

An account for experimental use of the TENEX system by network
users has been established by ARPA. The appropriate log-in
parameters for this account are   8e

    user name   TENAR
    password   ARPA
    account name   user's site-user's name (e.g.,
    UCLA-CROCKER)   8e1

This account should not be used extravagantly, or for
production work. Other user names and accounts can be
established by contacting the BBN Research Computer Center
administrator.   8f

To log out of the system, the user should transmit the
characters LOGO followed by ESC. The system will respond with
a message two lines in length. Following receipt of this
message the user should instruct his NCP to close both
connections.   8g

Additional informaion about communication with the Logger may
be found in the Executive Language Manual (see item IX).   8h

VIII. Computer Operator   9

Communication with the computer operator through the network
is not possible. The operator may be contacted by telephone
at (617) 491-1850 ext. 358 from 8:30 AM to 5:30 PM local time
(EST or EDT) on weekdays. During weekday evening hours, the
operator can be contaced at (617) 491-1869. The system is
unattended weekends and holidays.   9a

IX. Miscellaneous   10

The following three documents may be useful to system users.
All may be ordered from the Research Computer Center
administrator.   10a

    Executive Language Manual - A description of the TENEX
    command language as seen by a console user (or network
    user).   10a1

    JSYS Manual - A description of system calls provided for
    programs running on the PDP-10 under the TENEX system.   10a2

    TENEX memos - This collection of memos provides an overview
    of the TENEX system.   10a3

X. Programs   11

                                    TENEX   11a

TENEX is a virtual memory operating system for the
time-shared operation of DEC PDP-10 computers.   11a1

TENEX makes it easy to run problems requiring programs and
data bases much larger than the actual amount of core
memory available, allows the creation and running of
hierarchies of interdependent processes, allows large
numbers of users, provides real time response capabilities,
is very nicely human engineered, and offers high
reliabiliy. It runs most 10/50 code directly.   11a2

TENEX was developed by BBN and it requires modifications to
the KA-10 processor (available in kit form) and a device
called the BBN PAGER which is connected between the KA-10
and the KA-10's memory port.   11a3

The available documentation includes: 11a4

    1) JSYS Manual. Describes all the Monitor calls (Jump
    to SYStem) available in the TENEX system   11a4a

    2) TENEX Memos. A series of documents describing the
    TENEX software   11a4b

    3) TENEX Executive Language Manual. A well written,
    user-oriented description of the means which users
    communicate and work with TENEX.   11a4c

For further information contact Raymond Tomlinson or Mario
Grignetti, at Bolt Beranek and Newman, 40 Moulton St.,
Cambridge, Massachusetts 02138. Telephone Number: (617)
491-1850.   11a5

                                    LISP   11b

LISP is a facility for the construction and debugging of
programs for symbol manipulation.   11b1

Individuals responsible for the LISP system are Warren
Teitelman (617 491-1850 ext. 357), Daniel Bobrow, and Alice
Hartley. All of them may be contacted at Bolt Beranek and
Newman, 50 Moulton Street, Cambridge, Massachusetts 02138.   11b2

LISP is a well developed and documented language for symbol
manipulation and list processing (see, for example, The
Programming Language LISP; Its Operations and Applicatons,

                                      7

MIT Press, 1967). BBN LISP incorporates many useful
features including a large address space, a compatible
compiler and interpreter, automatic error correction, a
built-in editor, and extensive debugging aids.   11b3

A complete language description and operating instructions
can be found in the BBN LISP System manual, copies of which
can be ordered from Daniel Bobrow, Bolt Beranek and Newman,
50 Moulton Street, Cambridge, Massachusetts 02138.   11b4

<p align="center">ECAP   11c</p>

ECAP is an Electronic Circuit Analysis Program.   11c1

The individual responsible for ECAP is Jerry Burchfiel
(617-491-1850 ext. 298), Bolt Beranek and Newman, 50
Moulton Street, Cambridge, Massachusetts 02138.   11c2

This is an integrated system of programs which can be used
for design and analysis of electronic circuits. The system
of programs can produce DC, AC, and/or transient analyses
of electrical networks from a description of the
connections of the network (the circuit topology), a list
of corresponding circuit element values, a selection of the
type of analysis desired, a description of the circuit
excitation, and a list of the output desired.   11c3

The user requires neither a knowledge of the internal
construction of the system or programs nor computer
programming techniques to use ECAP effectively.   11c4

This subsystem was originally distributed as DECUS No.
10-34. It is documented in The IBM 1620 Electronic Circuit
Analysis User's Manual, #H20-0170-1.   11c5

Ecap accepts input from the file DSK:INPUT.DAT and writes
its output on DSK:OUTPT.DAT.   11c6

<p align="center">FLOW   11d</p>

FLOW is an automatic flowcharting program which produces a
flowchart, from a FORTRAN source file.   11d1

The individual responsible for FLOW is Duncan Miller,
(617-419-1850 ext. 334), Bolt Beranek and Newman, 50
Moulton Street, Cambridge, Massachusetts 02138.   11d2

This subsystem was originally distributed as DECUS 10-38,
from Bob Boylan at Digital Equipment Corp. (Last modified
by Tom Osten, DEC).   11d3

FLOW requests an input file name. This should be answered
with the 5 character name of a FORTRAN source file on the
DSK. It requests an output file, and a 5 character file
name should be supplied for the DSK output file.   11d4

During processing, a binary scratch file will be created on
the DSK. The ASCII output file will consist of a flow
chart of the FORTRAN source, followed by list of all
statement numbers used by the program.   11d5

<div align="center">DOCTOR</div>   11e

Simulated Psychiatrist   11e1

The individual responsible for DOCTOR is Warren Teitelman
(617-491-1850 ext. 357), Bolt Beranek and Newman, 50
Moulton Street, Cambridge, Mass. 02138.   11e2

DOCTOR is a LISP program written by Joseph Weizenbaum and
described in 'ELIZA - A Computer Program for the Study of
Natural Language Communication Between Man And Machine',
Comm. ACM, Vol. 9, #1, Jan. 1966.   11e3

DOCTOR simulates a psychiatric interview with a Rogerian
psychotherapist. The 'subject' types in some statement in
natural language using normal punctuation and sentence
structure. Two editing characters are provided: Control A
deletes the previous character typed in (repeatable back to
the previous space or comma), and # deletes the entire line
typed in.   11e4

The session is terminated by typing GOODBYE.   11e5

<div align="center">CHESS</div>   11f

CHESS is a chess-playing program.   11f1

The individual responsible for CHESS is Daniel Murphy,
(617-491-1850 ext. 351), Bolt Beranek and Newman, 50
Moulton Street, Cambridge, Mass. 02138.   11f2

CHESS is the chess-playing program developed by Richard
Greenblatt, Donald Eastlake, and Stephen Crocker at M.I.T.
It was described in "The Greenblatt Chess Program",
(authors above), P801-810 of 1967 Fall Joint Computer
Conference. The program is an honorary member of the
United States Chess Federation and the Massachusetts Chess
Association, under the name Mac Hack Six. In the April
1967 amateur tournament the program won the class D trophy;

it wins about 80% of its games against non-tournament
players.   11f3

During play, the program understands moves typed in using
standard chess notation, some examples of which are given
below.   11f4

    P-KN3   Pawn to King's Knight 3
    B*P   Bishop captures pawn
    O-O   Castle kingside
    QR-Q1   Queen's rook to queen 1
    R/K2-Q2   Rook on king 2 to queen 2
    P-R8   Promote pawn (assumed to
    queen)
    Q*P/Q6   Queen captures pawn on queen
    6
    O-O-O   Castle queenside   11f4a

Other commands are available for control and information: 11f5

    BD   Type out board
    PW   Play white
    PB   Play black
    PN   Play neither.   11f5a

    PS   Play self (both sides)
    M   Make next move
    U   Undo last move
    DRAW   Request machine to
    acknowledge

                                   last draw
    PG   Print game (history)
    LIST   List commands
    RESET   Overturn board (for bad
    sports)   11f5b

(J7761)   11-OCT-71 12:37;   Title: Author(s): Alex A. McKenzie/AAM;
Distribution: Alex A. McKenzie, Richard W. Watson/aam rww;
Sub-Collections: NIC; Clerk: AAM;
Origin: <BBN-IMP>AAM.NLS;2, 11-OCT-71 12:22 AAM ; .HJOURNAL="APR
71 NIC 6810";

This is a test.   1

(Journal) Journal Documents (most recent first)   2

   AAM 11-OCT-71 12:37   7761
   this is a message for discard (due to hacking)
   Location: (Journal, 7761, 1:W)   2a

   WSD 11-OCT-71 6:36   7708
   a Journal test
   Message: this is a test at he middle ofthe nic thing, but a
   test anyway   2b

   AKB 10-OCT-71 14:28   7706
   REQUEST FOR DOCUMENTS
   Message: PLEASE SEND LITERATURE ON JOURNAL AND NLS AND OTHER
   GOOD
   CLASSROOM DEMONSTRATIONS TO:
   PROFESSOR MARTIN GREENBERGER
   THE JOHNS HOPKINS UNIVERSITY
   BALTIMORE, MARYLAND 21218
   (301) 366-3300 EXT 895

                                                          2c

   JCN 6-OCT-71 15:38   7705
   Link/Advise -Refuse Default
   Location: (Journal, 7705, 1:w)   2d

   MFA 6-OCT-71 15:22   7703
   DESIGN PROPOSAL FOR USER DOCUMENTATION UPDATE PROCEDURES
   Location: (Journal, 7703, 1:w)   2e

   DCE 5-OCT-71 15:53   7698
   Phone Log: Call to DCE by J.C.R. Licklider re. special
   workshop on
   Location: (Journal, 7698, 1:w)   2f

   WHP 4-OCT-71 10:58   7684
   A Simple Bid-Scheduling Scheme
   Location: (Journal, 7684, 1:w)   2g

   ** DRAFT ** JCN 9 JAN 72 7679
   Initial Requirements for ARC Handbook Document Collection
   Location: (Journal, 7679, 1:w)   2h

   ** DRAFT ** JCN 9 JAN 72 7681
   Initial Requirements for ARC Information Service Operational

Procedures
Location: (Journal, 7681, 1:w)   2i

DVN 4-OCT-71 9:45   7683
10/1 NLS
An Oktober NLS Fest including Goto Program
Location: (Journal, 7683, 1:w)   2j

DCE 3-OCT-71 12:16   7676
Phone log: DCE with Robert Johnson of Burroughs; possible
visit to ARC by Robert Merril
Location: (Journal, 7676, 1:w)   2k

RWW 27-AUG-71 10:41   7612 (NWG/RFC# 221)
A MAIL BOX PROTOCOL VERSION-2
Location: (JOURNAL,7612,0:gw)   2l

DCE 26-AUG-71 18:21   7613
Visitor log: Second visit from Lee Talbert and Tom Lips,
Systems Analysis Office in OSD
Message: See (7499,) regarding their first visit, 16 Aug 71.
Today they spent about 7 hours with me (including lunch with
Dave Brown). I continued showing them NLS features,
throughout the day's discussions which ranged over:
augmentation systems; needs and possibilities for their
organization; and some of the general strategic considerations
that I'm evolving toward a "Bootstrap Community".   2m

DVN 26-AUG-71 16:51   7611
What I Have Been Doing To Your Files While You Were Gone
Location: (Journal, 7611, 1:w)   2n

DCE 26-AUG-71 15:21   7608
Note on future sales-type services from NIC and RINS, and
accounting-system implications.
Location: (Journal, 7608, 1:w)   2o

DVN 25-AUG-71 22:07   7606
New version of Locator
Location: (Journal, 7606, 1:w)   2p

BLP 24-AUG-71 15:02   7527
Design for Generalization of User Programs
Location: (Journal, 7527, 1:w)   2q

BLP CHI 24-AUG-71 14:56   7526
Proposed Requirements for an Archival System
Location: (Journal, 7526, 1:w)   2r

JCM 20-AUG-71 11:40   1020 (NWG/RFC# 203)
troll song body
Location: (Duvall, 1020, 1:w)   2s

RTB 20-AUG-71 11:40   1023 (NWG/RFC# 206)
trip report
Location: (Duvall, 1023, 1:w)   2t

RTB 20-AUG-71 11:26   1011
test title --journal exercise.
Message: this is garbage.........   2u

WSD 20-AUG-71 10:04   1000 (NWG/RFC# 200)
this is an rfc test
Message: this is a test message   2v

WSD 17-AUG-71 10:42   7501
Comment on (,7486)--Output file
Location: (Journal, 7501, 1:w)   2w

DVN 16-AUG-71 17:21   7498
Outline for August TNLS Course for Net People
Location: (Journal, 7498, 1:w)   2x

(J7763) 11-OCT-71 15:17; Title: Author(s): Richard W. Watson/RWW;
Distribution: MFA WLB RDB MSC WSD DCE BAH MEH FPH JDH CHI MEJ HGL JTM
JBN JCN CXP BLP WHP JCP JR BER EKV DVN KEV DCW RWW DIA JAF;/sri-arc;
Sub-Collections: NIC NWG SRI-ARC; RFC# 257; Clerk: RWW;
Origin: <WATSON>RWW.NLS;18, 11-OCT-71 13:01 XXX ;

sample session: using NIC journal with the help of NIC 7635

nic 7635 seems out of date, but this IS FUN.

sample session: using NIC journal with the help of NIC 7635

This is a sample message that I am sending to verify that every
thing works as it is documented in NIC Journal System user Guide.
(NIC 7635). One discrepency I found was in page 2 1h4, the line
should
be *e(xecute) j(ournal); possibly the difference is that I am
a T terminal instead of an N terminal. I also changed my CA
to (esc) instead of control D by execute viewchange. I think
you should explain what CA is in that sample message sending
scenario. Also if I exceed line do you put an automatic (CR), I
get a response
of **. Can the NIC Journal document be used independent of
TNLS User guide? The document doesn't say that control-A
is the rubout character, perhaps this is a system wide TENEX
standard. Does NIC Journal system follow all TENEX standards.

1

(J7765)   11-OCT-71 16:29;   Title: Author(s): Abhay K. Bhushan/AKB;
Distribution: Richard W. Watson, John T. Melvin, James C. Michener/rww
jtm jcm; Keywords: NIC 7635, Sample; Sub-Collections: NIC; Clerk: AKB;

Random Sample system use

this is samople messagee again from terminal net.
perhaps the best thing for me to do would be to go
into line mode. I already have local echo on.i found a number of
errors in your document
7635. perhaps we can discuss this at a later time. Also
I want to create some distribution groups specially
in the area of file transfer ,data transfer, and mail
protocols. I am now familiarizing myself with the use of the nic
system.
I like it. ofcourse altmode did not wpork as I have a
new nls.so let me try control-d.   1

Random Sample system use

(J7766)   11-OCT-71 16:48;   Title: Author(s): Abhay K. Bhushan/AKB;
Distribution: Richard W. Watson, Abhay K. Bhushan/rww AKB;
Sub-Collections: NIC; Clerk: AKB;

this is a test

this is a test message   1

this is a test

(J7768)   12-OCT-71 6:15;   Title: Author(s): William S. Duvall/WSD;
Distribution: John T. Melvin, Richard W. Watson, William S. Duvall/jtm
rww wsd; Sub-Collections: SRI-ARC; Clerk: WSD;

truth

system doesnt work. please fix.   1

truth

(J7769)   12-OCT-71 12:21;   Title: Author(s): Richard B. Kalin/RBK;
Distribution: Steve D. Crocker, Thomas F. Lawrence, John W. McConnell,
John F. Heafner, Robert E. Long, Ari O. J. Ollikainen, James E. White,
A. Wayne Hathaway, Dan L. Murphy, Patrick W. Foulk, Richard A. Winter,
Harold R. Van Zoeren, Alex A. McKenzie, Robert L. Sundberg, James M.
Madden, Joel M. Winett, Abhay K. Bhushan, Peggy M. Karp, Thomas N. Pyke,
Abe S. Landsberg, B. Michael Wilber, James A. Moorer, Edward A.
Feigenbaum, Robert T. Braden, James M. Pepin, Barry D. Wessler, John T.
Melvin, John C. LeGates, Art J. Bernstein, C. D. Shepard, Robert F.
Hargraves, EMA/nwg; Sub-Collections: NIC; Clerk: RBK;

sample 7770 abcdefg

this is a recording..........   1

sample 7770 abcdefg

(J7770)   12-OCT-71 12:25;   Title: Author(s): Richard B. Kalin/RBK;
Distribution: Richard B. Kalin/RBK; Sub-Collections: NIC; Clerk: RBK;

dirty message

this is a quick and dirty messagde.   1

dirty message

(J7771)   12-OCT-71 12:31;   Title: Author(s): Dan L. Murphy/DLM;
Distribution: Don C. Wallace/dcw; Sub-Collections: NIC; Clerk: DLM;

garbage

this is a test message!!!!!!!!!!

jjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjjhhhhhhhhhhhhhhhh   1

garbage

(J7772)   12-OCT-71 12:29;   Title: Author(s): Shirley W. Watkins/SWW;
Distribution: Shirley W. Watkins/SWW; Sub-Collections: NIC; Clerk: SWW;

students working

this is a message from your happy students   1

(J7773)   12-OCT-71 12:32;   Title: Author(s): Richard W. Watson/RWW;
Distribution: Richard W. Watson, John T. Melvin/rww jtm;
Sub-Collections: SRI-ARC; Clerk: RWW;

testmessage

What the hell is clerk

testmessage

this is a message from karl kelley of illinois....
we are trying to learn how to use the system.
It appears that we are successfull!

1

testmessage

(J7774)   12-OCT-71 12:30;   Title: Author(s): W. Jack Bouknight/WJB;
Distribution: Steve D. Crocker, Thomas F. Lawrence, John W. McConnell,
John F. Heafner, Robert E. Long, Ari O. J. Ollikainen, James E. White,
A. Wayne Hathaway, Dan L. Murphy, Patrick W. Foulk, Richard A. Winter,
Harold R. Van Zoeren, Alex A. McKenzie, Robert L. Sundberg, James M.
Madden, Joel M. Winett, Abhay K. Bhushan, Peggy M. Karp, Thomas N. Pyke,
Abe S. Landsberg, B. Michael Wilber, James A. Moorer, Edward A.
Feigenbaum, Robert T. Braden, James M. Pepin, Barry D. Wessler, John T.
Melvin, John C. LeGates, Art J. Bernstein, C. D. Shepard, Robert F.
Hargraves, EMA/nwg; Keywords: eymessage; Sub-Collections: NIC; Clerk:
WJB;

garbage2

this is our second messagee for the day111111!!!!!!!!   1

garbage2

(J7775)   12-OCT-71 12:36;   Title: Author(s): Shirley W. Watkins/SWW;
Distribution: Carol J. Mostrom/cjm; Sub-Collections: NIC; Clerk: SWW;

this is a message.   1

(J7776)   12-OCT-71 12:43;   Title: Author(s): Donald L. McNally/DLM2;
Distribution: John T. Melvin, Donald L. McNally/jtm dlm2;
Sub-Collections: NIC; Clerk: DLM2;

Memo to: Patrick Foulk   1

via NIC: or   2

       John Barden
       Case Western Reserve University   3

From: Jeanne North   4

Please tell Marshall J. Moore, Crawford Hall, that the report he
requested (by letter to Bertram Raphael) by Engelbart, Hay, and
Kirkley is out of date as well as out of print. He should look
at copies of NIC 4792 and 5139 in John Barden's NIC Station
Collection.   5

(J7801)   12-OCT-71 15:33;   Title: Author(s): Jeanne B. North/JBN;
Distribution: Barbara E. Row/BER; Sub-Collections: SRI-ARC; Clerk: BER;
Origin: <ROW>NICMEMO.NLS;1, 12-OCT-71 15:29 BER ;

<WALLACE>TENEX-SOURCES.NLS;2, 13-OCT-71 12:28 DCW ;   1

                                                                               1a
    i would like to propose the following procedure for making
    changes to the TENEX system source files.   1b

    comment: 1c

        in the past we have made new versions with "personal
        extentions   1c1

        (ie: TTYSERV.KEV...etc.). this procedure only works if one
        person is making the changes. it is not now possible (or
        will it ever be) to have only one person making monitor
        changes. we presently have 5 people activley working on
        tenex.   1c2

    new procedure: 1d

        if you want to make a change that is to be either "future
        or experimental" then;   1d1

            1) define a flag that can be tested by the conditional
            assembly   pseudo-ops of MACRO and FAIL.   1d1a

            2) bracket all old and new code with conditional
            assembly   pseudo-ops   1d1b

        example: 1d2

        kev==1   ;new big character display stuff flag   1d2a

                                                                              1d2b
        IFE KEV,<   1d2c

                HRROI   A,[ASCIZ /THIS IS THE OLD CODE/]   1d2d

            >   1d2e

        IFN KEV,<   1d2f

                HRROI   A,[ASCIZ /THIS IS THE NEW CODE/]   1d2g

            >   1d2h

    bugs and fixes: 1e

proposal for changing tenex monitor source files

bugs and fixes should continue to be handled in an
immediate fashion   1e1

whenever you make any changes to the binary ...you must
change the sources at the same time. you also must replace
the changed files listing in the monitor listing set with
the new version.   1e2

proposal for changing tenex monitor source files

(J7802) 13-OCT-71 12:36; Title: Author(s): Don C. Wallace/DCW;
Distribution: John T. Melvin, Don I. Andrews, Don C. Wallace, Ed K. Van
De Riet, Charles H. Irby, J. D. Hopper, James C. Norton/jtm dia dcw ekv
chi jdh jcn; Sub-Collections: SRI-ARC; Clerk: DCW;

Two routines have been written to augment implementation of help
commands.   1

   help.   1a

      Accepts up to 30 strings (addresses), and types them onto
the typewriter separated by CRLF.   1a1

      The last parameter is a flag used for terminating the
parameter list, and indicating the type of return desired.   1a2

        = 0: Do not return, but execute a GOTO STATE   1a2a

        =-1: RETURN Normally   1a2b

        =-2: Call SIGNAL with the value 'statesig'   1a2c

   twohelp   1b

      This procedure is identical to help, except that it
precedes the typing of any strings by the message: "Two
characters required. Commands are: ".   1b1

Example: 2

   help   2a

     = '?:   2a1

       help($"Author(s):",   2a1a

          $"Clerk",   2a1a1

          $"Comments",   2a1a2

          $"Distribution: ",   2a1a3

          % $"Expedite ", %   2a1a4

          $"Go? ",   2a1a5

          $"Interrogate",   2a1a6

          $"Keywords: ",   2a1a7

          $"Obsoletes Document(s): ",   2a1a8

          $"Place link (if successful) ?",   2a1a9

```
            $"Quit",                                              2a1a1o

            $"Status",                                            2a1a11

            $"Subcollection(s): ",                               2a1a12

            $"Title: ",                                           2a1a13

            $"Updates Document(s): ",                            2a1a14

            0);                                                  2a1a15

     twohelp                                                     2b

       ='C:                                                      2b1

          BEGIN                                                  2b1a

          todco('C);                                            2b1b

          CASE inpcuc() OF                                       2b1c

            ='L:                                                 2b1c1

               BEGIN                                             2b1c1a

               porecho(interflag,$"lerk: ");                    2b1c1b

               *identstr* ← NULL;                                2b1c1c

               echon();                                          2b1c1d

               tirdid($identstr, 0, 0);                          2b1c1e

               IF curchr # CA THEN %Identlist not terminated by
               CA%                                               2b1c1f

                  err($"Clerk may be only one person");          2b1c1f1

               setjclerk($identstr);                             2b1c1g

               END;                                              2b1c1h

            ='O:                                                 2b1c2

               BEGIN                                             2b1c2a

               porecho(interflag,$"omments: ");                 2b1c2b
```

```
          *lit* ← NULL;                              2b1c2c

          txtlit($lit);                              2b1c2d

          setjcomment($lit)                          2b1c2e

          END;                                       2b1c2f

       ENDCASE                                       2b1c3

          twohelp($"Clerk", $"Comments", 0);         2b1c3a

    END;                                             2b1d
```

(J7804)   13-OCT-71 13:13;   Title: Author(s): William S. Duvall/WSD;
Distribution: Walter L. Bass, Mary S. Church, William S. Duvall, J. D.
Hopper, Charles H. Irby, Harvey G. Lehtman, Bruce L. Parsley, William H.
Paxton/npg; Sub-Collections: SRI-ARC; Clerk: WSD;

A Group for NLS Programmer Communication

I have created a new group within the identification system.   1

    The NLS Programming Group (NPG) is intended to be used for
communication between persons working on/in the NLS
programming environment.   1a

        I would anticipate using this group in conjunction with the
Journal for the dessimination of information relevant to
the NLS Programming environment, e.g. new techniques and
routines, notice of modification to important routines,
notification of unusual situations with regard to
loading/compiling, etc.   1a1

A Group for NLS Programmer Communication

(J7805) 13-OCT-71 14:20;   Title: Author(s): William S. Duvall/WSD;
Distribution: Walter L. Bass, Mary S. Church, William S. Duvall, J. D.
Hopper, Charles H. Irby, Harvey G. Lehtman, Bruce L. Parsley, William H.
Paxton/npg; Sub-Collections: SRI-ARC; Clerk: WSD;

Proposal for creating functional groups, with specific
suggestions applying to NLS Bug reporting, and Documentation
updating.

Proposal for creation of documentation and bugs groups.   1

   One of the uses for the Group capability of the identification
   system is he establishment of groups which may serve as
   targets for all communication relating to a specific function.   1a

   Two such groups could be set up to aid in reporting and
   recording of NLS bugs, and updating documentation.   1b

   NLS Bugs   1c

      I propose that a group be established with the ident
      NLSBUG.   1c1

      Bug reporting may subsequently be done by sending a
      message/document to the NLSBUG group through the Journal.   1c2

      The group would be set up so that the bugs would be
      directed to the relevant people.   1c3

   Documenation   1d

      For documentation, I propose that a group with the ident
      DOC be established.   1d1

      Subsequently, any command syntax or semantic changes, new
      command documentation, reports of documentation errors,
      etc. could be directed through the Journal to the DOC
      group.   1d2

      As with the NLSBUG group, the DOC group will be set up so
      that the proper persons recieve the information.   1d3

   I would like to do this soon, and would appreciate any
   feedback by WEDS, Oct 20.   1e

Proposal for creating functional groups, with specific
suggestions applying to NLS Bug reporting, and Documentation
updating.

Viewspecs, Mouse and Keyset, Codes and Cases

Some of you may have seen sheetsof paper floating in the display
area that list either the viewspecs, or the complete
mouse-keyset code.   1

The sheets that are dated ealier than 9/9 are inaccurate and the
best thing to do with them is throw them away.   2

New verssions of these tables have been printed back-to-back on
wallet-size cards. They are inaccurate only with respect ot
viewpsec k (journal,7683,7). Barabara Row has a supply of them at
ARC..   3

I am entering the tables from which the cards are printed in the
journal.   The descrition of k is up to date.. The life-size
versions may be handier to glance at while working.   4

    (Journal,7389,1) lists all the viewspecs with their letter
    codes. Note that not all the viespecs listed work.   4a

    (Journal,7390,1) lists the full mouse-keyset code.   4b

Viewspecs, Mouse and Keyset, Codes and Cases

(J7807)   13-OCT-71 15:49;   Title: Author(s): Dirk H. van Nouhuys/DVN;
Distribution: Robert E. Kahn, Peggy M. Karp, L. Peter Deutsch, James G.
Mitchell, Alan C. Kay, Marilyn F. Auerbach, William S. Duvall,
Beauregard A. Hardeman, Martin E. Hardy, Fred P. Hocker, J. D. Hopper,
Mil Jernigan, John T. Melvin, Jeanne B. North, James C. Norton, William
H. Paxton, Barbara E. Row, Ed K. Van De Riet, Dirk H. van Nouhuys,
Richard W. Watson, Don I. Andrews, Duane L. Stone, Thomas F. Lawrence,
Stan L. Mantiply, John W. McConnell, David M. Grothe, Alex A. McKenzie,
Dirk H. van Nouhuys/tu; Sub-Collections: SRI-ARC; Clerk: DVN;
Origin: <VANNOUHUYS>JOURDRAFT.NLS;5, 13-OCT-71 15:10 DVN ;

Proposed Modification to the Place Link syntax in the Journal.

I would like to modify the place link command in the Journal so
that it uses the following syntax: 1

   P[Place link at] ADDRESS CA LEVADJ   1a

Additionally, I would like to add it to the list of commands
invoked by Interrogate.   2

Proposed Modification to the Place Link syntax in the Journal.

(J7808) 13-OCT-71 16:11; Title: Author(s): William S. Duvall/WSD;
Distribution: William S. Duvall, Mary S. Church, Douglas C. Engelbart,
Charles H. Irby, Harvey G. Lehtman, James C. Norton, Bruce L. Parsley,
William H. Paxton, Richard W. Watson/dssig; Sub-Collections: SRI-ARC;
Clerk: WSD;

Draft of DSS Baseline Plan--Part I

Stages of development, task relationships, effort levels, and staffing implications will follow shortly.

Draft of DSS Baseline Plan--Part I

Basic Objectives   1

  In the context of a research activity   1a

    To devise, build, and evaluate prototypical systems,
procedures, and concepts which augment Dialogue between two
or more teams.   1a1

    Dialogue is interpreted to be any communication which has
the purpose of collaboration (cooperation) with regards to
a common problem.   1a2

    There are two aspects of dialogue which are of especial
interest to the DSS activity in the coming 30 month period.   1a3

      (1) Recorded Dialogue.   1a3a

        This is dialogue via an intermediary, which has the
characteristic of retaining the content of a specific
dilogue session, and cataloging it in a manner such
that it may be used as a permanent reference base for
future dialogue.   1a3a1

        The interest of the DSS in Recorded dialogue includes
not only the dialogue itself, but techniques for
manipulating the dialogue, and using it as a base for
subsequent dialogue.   1a3a2

        Currently, our Journal is used as a repository for
recorded dialogue.   1a3a3

      (2) Developmental Dialogue.   1a3b

        This is dialogue directly between two or more teams,
which will serve as a base for recorded dialogue
after suitable development.   1a3b1

        The DSS has several interests in this area.   1a3b2

          It is interested in providing augmentation tools
for developmental dialogue.   1a3b2a

            This involves a large spectrum ranging from a
simple linking mechanism through systems which
help maintain the status of a developing
dialogue and thence onward to complicated
voice/display interaction systems.   1a3b2a1

            Included in these tools will be convenient

techniques for extracting recorded dialogue from
developmental dialogue.   1a3b2b

It has a common interest with recorded dialogue in
providing suitable search and retrieval tools for
allowing the utilisation of recorded dialogue as a
base for developmental dialogue.   1a3b2c

In the context of a service activity   1b

As other activities develop needs for Dialogue tools, the
DSS will respond with proposals to suit those needs.   1b1

These proposals will, insofar as possible, attempt to
embody techniques and tools which have already been tested
in prototype form by the research DSS activity.   1b2

Proposals may then be followed by contracts for building
the systems, etc. described by the proposals.   1b3

It is clear that the research activity must anticipate the
needs of the service activity, an as such will frequently
interact closely with the activities creating the needs.   1c

Features   2

The features are divided between the service activity and the
research activity.   2a

In order to be a feature of the service activity, a task
must either be well-defined itself, or be relatively
well-defined with respect to an existing service, e.g. the
Journal.   2a1

Some of the tasks in the service activity may require work
under the research activity, just as many of the features
in the research activity section will be moved into the
service activity section as they become solidified, and
specific service contracts are made for them.   2a2

Service Activity   2b

Journal System   2b1

Develop Journal for DNLS   2b1a

Improve efficiency and response   2b1b

Specific areas for improvement include: 2b1b1

Open file machinery   2b1b1a

Breaking up and grouping of Journal files used in
interactive portion of the system   2b1b1b

Running Journal execution as background fork if we
decide it is desirable   2b1b1c

Reducing redundancy if/when reliability improves   2b1b1d

Improve reliability   2b1c

This generally means find better ways of recovering
from file system errors.   2b1c1

Some possibilities are: 2b1c2

Develop a system which reconstructs Journal files
from other files using the redundancy which exists
in the files.   2b1c2a

Associated with this is a procedure which
verifies the consistancy of the Journal files. 2b1c2a1

Move the Journal files onto te Drum to reduce the
error rate   2b1c2b

Integrate the Journal into the Master Catalog System.   2b1d

Two stages: 2b1d1

Develop satisfactory procedures for converting
JCAT into MCAT entries and process.   2b1d1a

Eliminate JCAT when the MCAT system gets built.
This includes the necessary speed and reliability
necessary to the Journal.   2b1d1b

Integrate the File System into the Journal   2b1e

This should be taken care of by the MCAT system, but
if we are slower with the MCAT system than the File
System, the Journal will need to use the File System
on its own.   2b1e1

It may even become necessary to develop an interim
file system to fullfill the Journals needs if
activity is high enough.   2b1e2

3

Implement New delivery techniques as they become
necessary.   2b1f

   On-line delivery over the Network   2b1f1

   Delivery to Station Agents over the NET.   2b1f2

   Hard Copy via the NET   2b1f3

Develop routines to make the distribution file, number
file, and catalog file compatible after errors, i.e. the
situation where an aborted entry has been made in one of
the files, and not the others.   2b1g

Implement a capability for editing Messages, titles,
comments, keywords, etc. before 'Go is executed.   2b1h

Change command language according to (7810,)   2b1i

General evolution and maintenance.   2b1j

Identification System   2b2

   Change get/set Routines to: 2b2a

      Mebbee work without using T-pointers   2b2a1

      Provide logical fields.   2b2a2

   Make a major revision of IDENT System   2b2b

   Improve verification techniques for new entries   2b2c

   Improve file handling, specifically, break up identfile
into more effeciently handled segments.   2b2d

Number System   2b3

   Change Pre-assigned number machinery to look more like
RFC number stuff, i.e. get Title, distribution, etc.   2b3a

   Provide necessary tools for manual operation of Number
system.   2b3b

      For example, we need a way of pre-assigning a number
on a 'Dummy' basis to a custodian, and subsequently
allowing the custodian to 'give' the number to
someone, and then fill in the title, distribution,
author, etc. fields.   2b3b1

4

Implement a Number Status command.   2b3c

    This needs to allow the user to get the status of any
number (if he knows the owner).   2b3c1

    It additionally needs a facility whereby a user can
see the status of all numbers pre-assigned to him.   2b3c2

Provide a mechanism for re-using lost numbers.   2b3d

    Lost numbrs are generated when a user bombs out of
the Journal.   2b3d1

    Perhaps we could consider these numbers pre-assigned
or ???.   2b3d2

    This relates to the question of whether or not we are
really concerned about keeping our numbers in order.   2b3d3

Research Activity.   2c

  Flexible Document System   2c1

    A system for supporting developmental dialogue.   2c1a

    Similar in appearance to the Journal, except that a
document entered into the system is not frozen.   2c1b

      Rather, it serves as a dynamic base for dialogue
until such time as a significant milestone os
reached, in which case a copy of it may be frozen
into the Journal system.   2c1b1

    The Flexible Document system also has the capability of
dealing with groups of documents as single 'Functional'
documents.   2c1c

  Set Manipulation   2c2

    There are two projects under the set system.   2c2a

      The first involves a relatively simple...yet
useful..initial set system, which is relatively
easily implemented with the current programming tools
and in te current NLS environment.   2c2a1

      The second is the full blown set system, which has
been in the process of specification for some time,
an probably will be for some time.   2c2a2

Back links   2c3

 This is the so-long planned back link feature in NLS.   2c3a

File System   2c4

 Some part of the specification of the archive file
 system falls in the baliwick of the DSS.   2c4a

Master Catalog System.   2c5

 The DSS has a part in the development of the Master
 Catalog System   2c5a

Comments on frozen documents.   2c6

Network Dialogue Participation   2c7

 The DSS has an interest in participating in te Network
 Dalogue effort, and in participating in the experiments
 where it is feasible, justifiable, and relevant.   2c7a

 Currently planned projects include a network facility
 for linking and advising, and a base suitable for
 subsequent dialogue.   2c7b

Extended linking an advising capability.   2c8

 I would like to begin work on the problem of
 intraction/dialogue on display terminals.   2c8a

 This opens up a large area.   2c8b

 A first step might be the linking of NLS displays and
 allowing common cursers.   2c8c

 This project is related to te Network Dialogue effort   2c8d

Introduction of new media into the recorded (and
developmental) dialogue system.   2c9

 One specific possibility in the time frame fo this
 document is voice.   2c9a

 Other possibilities include video, various types of hard
 copy, and graphics.   2c9b

New procedures, methodology, etc.   3

Draft of DSS Baseline Plan—Part I

Remove the irritants from dialogue.   3a

   Dialogue, as it currently exists, contains a number of
   irritants to the participants.   3a1

      Irritants which immediately come to mind are: 3a1a

         The irritating sound of a telephone ringing (for
         voice dialogue)   3a1a1

         Not knowing where another user is with regards to
         telephone (which plays a substantial role in our
         current developmental dialogue).   3a1a2

         The lack of knowledge about the interruptability of a
         person with whom a user desires dialogue.   3a1a3

Making dialogue attractive.   3b

   In some sense, written dialogue is contrary to the
   inclinations of most programmers.   3b1

   In order to make dialogue effective, it must strive to be
   responsive in a manner such that it eliminates the negative
   vibes.   3b2

Integration of 'Outside World' techniques and knowledge into
our internal system.   3c

Setting up a proper feedback loop for improving dialogue
through the reactions of actual users, particular those
outside of ARC.   3d

Consolidation of dialogue systems, so that a minimum of
systems may suit the needs of a maximum of activities.   3e

Development of adequate operating procedures for hard copy,
etc.   3f
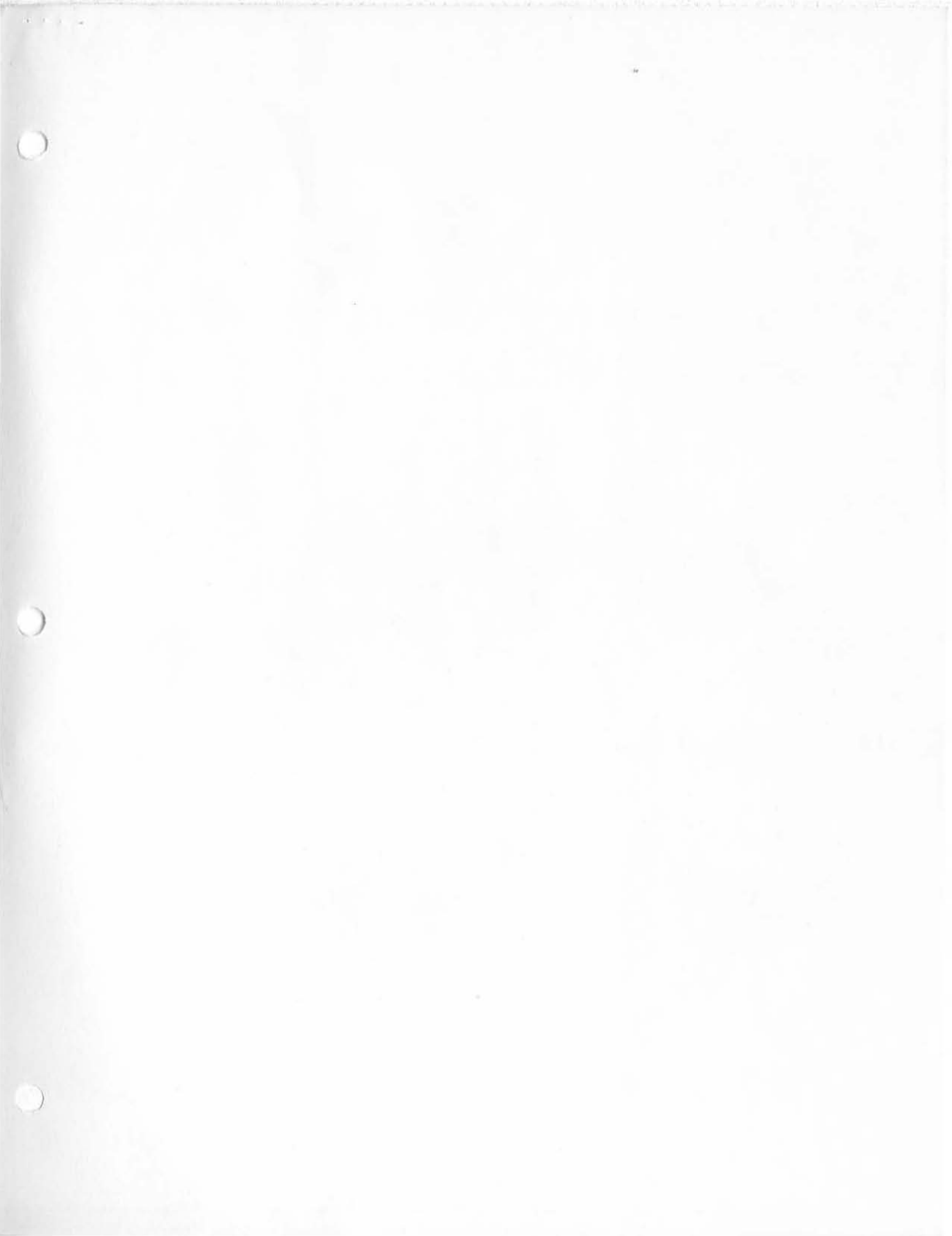
```
<DOCUMENTATION>30-MAY-72LPT.TXT;*          <DOCUMENTATION>30-MAY-72LPT.TXT;*
   **N>30-MAY-72LPT.TXT;*
<DOCUMENTATION>30-MAY-72LPT.TXT;*          <DOCUMENTATION>30-MAY-72LPT.TXT;*
   **N>30-MAY-72LPT.TXT;*
<DOCUMENTATION>30-MAY-72LPT.TXT;*          <DOCUMENTATION>30-MAY-72LPT.TXT;*
   **N>30-MAY-72LPT.TXT;*
<DOCUMENTATION>30-MAY-72LPT.TXT;*          <DOCUMENTATION>30-MAY-72LPT.TXT;*
   **N>30-MAY-72LPT.TXT;*
<DOCUMENTATION>30-MAY-72LPT.TXT;*          <DOCUMENTATION>30-MAY-72LPT.TXT;*
   **N>30-MAY-72LPT.TXT;*
```

Draft of DSS Baseline Plan--Part I

(J7821)   14-OCT-71 17:04;   Title: Author(s): William S. Duvall/WSD;
Distribution: James C. Norton/jcn; Sub-Collections: SRI-ARC; Clerk: WSD;

Proposal for changing Journal Command Structure

Partially in response to (7682,)

Proposal for changing Journal Command Structure

I propose that the Journal commands be changed in the following
manner: 1

   The syntax of Execute Journal will be changed to: E[xecute]
   J[ournal] CA.   1a

      The comman will place the user into a command submode whose
      hearald is '&.   1a1

   The commands of the submode will be: 1b

      C[atalog update] CA [
      Password] PASSWORD CA   1b1

         Same as current Execute Katalog Kleanup.   1b1a

      D[istribute Document #] NUMBER [
      To:] IDENTLIST CA.   1b2

         Replaces Execute Secondary Distribution.   1b2a

      H[ard copy distribution] CA [
      Password:] PASSWORD [
      Operator:] IDENT CA   1b3

         Same as current Execute Hard Copy.   1b3a

      S[ubmit] 1b4

      Remaining syntax and semantics are the same as for the
      current Execute Journal command, except that the hearald
      in the entry submode will be "&&" instead of the current
      '&.   1b4a

Proposal for changing Journal Command Structure

(J7822) 14-OCT-71 17:28; Title: Author(s): William S. Duvall/WSD;
Distribution: William S. Duvall, Mary S. Church, Douglas C. Engelbart,
Charles H. Irby, Harvey G. Lehtman, James C. Norton, Bruce L. Parsley,
William H. Paxton, Richard W. Watson, L. Peter Deutsch, Marilyn F.
Auerbach/dssig lpd mfa; Sub-Collections: SRI-ARC; Clerk: WSD;

<UCLA-7>TEST.NLS;2, 15-OCT-71 12:24 CSK ;   1

   This is a message for John Melvin.   1a

   The directory of user UCLA-7 is all screwed up.   1b

      When I try to do a DIR command at EXEC level I get an
      illegal instruction trap.   1b1

   Please fix. Thanks.   1c

(J7823) 15-OCT-71 12:33; Title: Author(s): Chuck S. Kline/CSK;
Distribution: John T. Melvin, Richard W. Watson/JTM RWW;
Sub-Collections: NIC; Clerk: CSK;

Bill, a couple of weeks ago I got two preassigned journal numbers
to use in a journal itme I put out about changes in the system
(journal,7683,). Bruce intended to write furtner about some of
the subjects and the documents he planned were to have those
numbers. I later discovered that the number system was screwed
up that afternoon and gave me numbers that can never be used
(7715)and (7717).   1

Jim suggest that the threat of all future users who try to link
from those items is troublesome enough that you should take
special measures to change those numbers in the journal item to
numbers that will get them somewhere.   2

What to do about bad journal numbers

(J7824) 15-OCT-71 14:07; Title: Author(s): Dirk H. van Nouhuys/DVN;
Distribution: William S. Duvall, James C. Norton/wsd jcn;
Sub-Collections: SRI-ARC; Clerk: DVN;
Origin: <VANNOUHUYS>JOURDRAFT.NLS;5, 15-OCT-71 14:03 DVN ;

Some suggestions toward making the Goto Programs stuff easier to
use for the Novice user.

Bruce... I have noted a few things which might be done to make he
user program stuff a little easier for the novice user.   1

   (1) Implement the '? Help commands.   1a

     I could not find any trace of this option in the running
     system.   1a1

   (2) When a user compiles an L10 program, institute it as his
   content analyser program if there is not already one there.   1b

     I don't see where this would mess anything up, and it would
     make the content analyser L10 program feature easier to
     use.   1b1

Some suggestions toward making the Goto Programs stuff easier to
use for the Novice user.

(J7827) 17-OCT-71 11:52; Title: Author(s): William S. Duvall/WSD;
Distribution: Bruce L. Parsley, James C. Norton, Richard W. Watson,
Charles H. Irby, Walter L. Bass/blp jcn rww chi Wlb; Sub-Collections:
SRI-ARC; Clerk: WSD;

A suggestion for facilitating the updating of baseline
information

How about the following for handling additions, modifications,
etc. to baseline planning.   1

   A group with the ident BASE or PLAN or somehting similar is
   created.   1a

   Any user may subsequently direct any baseline information,
   including new tasks, modifications of tasks, extensions,
   deletions, etc. to that group via the Journal.   1b

   This provides a relatively spontaneous way (to the user) of
   delivering this information.   1c

   This is especially important in the area of collecting the 'I
   know how to do that (or fix that or improve that)' type of
   task, which often enters and leaves ones consciousness
   quickly.   1d

   From the baseline record systems point of view, this provides
   a convenient receptacle for baseline information, and does not
   depend on the presence of any one particular Person.   1e

   The Journal provides ample information about the sender and
   time of entry, etc. to facilitate the conversion of items
   presented in this manner into standard baseline record format
   at a later time.   1f

A suggestion for facilitating the updating of baseline
information

(J7828) 17-OCT-71 12:12; Title: Author(s): William S. Duvall/WSD;
Distribution: James C. Norton, Bruce L. Parsley, J. D. Hopper/jcn blp
jdh; Sub-Collections: SRI-ARC; Clerk: WSD;

Load Locked File Command

I have implemented a command which is intended as an aid in
debugging and recovering files.   1

Specifically, it is useful in recovering files which have been
locked by any of the openlock machinery (i.e. journal type stuff
now).   2

It loads a file plus its partial copy regardless of who the
locking user/ident is.   3

   The only time it will fail is when and if the partial copy
   cannot be opened because it is busy, or because there has been
   a system (disk) error.   3a

The command is a little touchy because it uses a lock mechanism
which is common with the running system.   4

   The implication of this is that if you ↑C out of a request, it
   is possible to leave a system global flag set, which will
   cause a delay plus an error message for the next user to use
   any command/system which uses the openlock machinery.   4a

The command is recognised only if you are logged in as a user
which has the wheel capability.   5

   This is intended to discourage casual and unauthorised use.   5a

At some later date, we can presumably use NLS capabilities for
determining the legality of it, rather than the TENEX
capabilities.   6

Syntax: 7

   'Load 'Locked File FILNAME CA   7a

Semantics: 8

   Identical to load file, except will fail with message 'File
   Locked Too Long' if it cannot open the PC after about 30
   seconds.   8a

   This command creates a PC if there is not already one
   associated with the file, and the PC is created in the
   CONNECTED DIRECTORY rather than the logged-in directory   8b

(J7829) 17-OCT-71 17:33; Title: Author(s): William S. Duvall/WSD;
Distribution: Walter L. Bass, Mary S. Church, William S. Duvall, J. D.
Hopper, Charles H. Irby, Harvey G. Lehtman, Bruce L. Parsley, William H.
Paxton, Dirk H. van Nouhuys, Marilyn F. Auerbach/npg dvn mfa;
Sub-Collections: SRI-ARC; Clerk: WSD;

Initial Requirements for ARC Handbook Document Collection

One of the proposed Baseline activities for ARC is the development of a "Handbook" and a system for continually revising and updating its content and form.   1

   This activity is just starting to be planned now, with DCE as the pusher – at least until another appropriate person comes along.   1a

We have been discussing the coming ARC Handbook for many months, but have yet to start collecting and organizing the documents (or views) that will comprise its core.   2

I have asked Marilyn to collect all existing documents that would be part of the Handbook and be sure that they are entered into the Journal and shelved together with the ARC access copies.   3

   We will then arrange the Baseline, current dialog, and outdated dialog documents in separate shelf groupings with corresponding shelf listing.   3a

   Doug has ideas (surprise, surprise) about many parts of this design and should be included in the process.   3b

Here is a rough outline of the types of things we will include in the initial Handbook collection: 4

SHELF LISTING   5

   ARC HANDBOOK   5a

      1. Current System Features   5a1

         a. From user standpoint   5a1a

            TNLS Users Guide   5a1a1

            Journal System Users Guide   5a1a2

            Old DNLS Users Guide badly outdated ..with supplements?   5a1a3

            Output Processor Users Guide and supplements   5a1a4

               (see Journal index for pieces?)   5a1a4a

            Smokey's Operator's Guide in preparation   5a1a5

            Journal Clerical users guide .. see BLP   5a1a6

            Baseline Clerical uusers guide .. see BLP   5a1a7

DEX Users Guide .. see DVN   5a1a8

Nic User guide ???   5a1a9

TENEX Users Guide   5a1a10

PDP10 User Guide (?)   5a1a11

JSYS Manual?   5a1a12

Information Service Operating Procedures (see--
7681)   5a1a13

Any others not listed here?   5a1a14

b. From design standpoint   5a1b

Designs for NLS features (completed ones)   5a1b1

Where they exist..most dont   5a1b1a

Try DEX   5a1b1a1

Sorter   5a1b1a2

Some of Walter's stuff?   5a1b1a3

Perhaps Mimi's ident stuff has this kind of
documentation   5a1b1a4

NOTE: Most future designs will come out of the
Baseline Planning process, having been updated as
the designs change during implementation. Note
that the Handbook will not contain designs of
features that are not yet in operational use   5a1b1b

Key hardware documents   5a1b2

(do these last to give Ed some breathing room,
but don't omit)   5a1b2a

c. From detail standpoint (code, diagrams,+)   5a1c

Perhaps start with listing from Smokey for TENEX   5a1c1

Whats date..when appropriate to get next update?? 5a1c1a

NLS listing current one?   5a1c2

Whats date..when appropriate to get next update?? 5a1c2a

2. Reports and Proposals   5a2

    For now,   5a2a

        the recent RADC (2), NASA (1) reports   5a2a1

        and ONR and RADC Proposals   5a2a2

        the 1962 AFOSR Report   5a2a3

3. Principles of Design   5a3

    Most to come   5a3a

    Study of Baseline catalog and preparation of "initial
    guide" to relevant documents ? or what?   5a3b

4. References to Relevant Dialog   5a4

    Study of Baseline catalog and preparation of "initial
    guide" to relevant documents ? or what?   5a4a

(J7830) ; Title: Author(s): James C. Norton/JCN; Distribution: Marilyn
F. Auerbach, Douglas C. Engelbart/MFA DCE; Sub-Collections: SRI-ARC;
Clerk: JCN;
Origin: <NORTON>J7679.NLS;1, 18-OCT-71 8:42 JCN ; .RTJ=0;
18-OCT-71 9:19;

Using ALTMODE for CA in TNLS

Now that we have had some experience in using TNLS, including
some use via the NET, I would like to once again propose that
ALTMODE be made the Command Accept Key.   1

It is more convenient that ↑D to use, plus it is reasonably
compatible with the TENEX and 10/50 systems, plus possibly some
others I don't know of.   2

I propose that it be done by either introducing another device
(e.g. FULL U/L for Full Duplex, Upper/Lower Case) or by modifying
th character definitions for one of the current devices, e.g.
TI-Terminal   3

Using ALTMODE for CA in TNLS

(J7831) 18-OCT-71 10:09; Title: Author(s): William S. Duvall/WSD;
Distribution: Richard W. Watson, John T. Melvin, James C. Norton,
Charles H. Irby, Mary S. Church/rww jtm jcn chi msc; Sub-Collections:
SRI-ARC; Clerk: WSD;

Outline for Establishing People Service Support Team (PSST) at ARC

Outline for Establishing People Service Support Team (PSST) at ARC

INTRODUCTION: 1

Introduction During the past year ARC has developed several service
functions that are now becoming operational for ARC users and
in some cases providing service to external users.   1a

These functions (from activities such as NIC, Baseline Record
and, Journal) and the forthcoming use of new DEX techniques
have created several new types of needs for people and service
support.   1b

It appears that we should re-organize these activities to
allow more effective and efficient handling of routine and
other tasks and to allow for easier expansion of the group
size to meet needs for a increasing amount of thruput.   1c

Since we are also moving toward collaboration with RADC
(baseline management system development) and NASA
(documentation production and control) we also expect a
considerably greater workload to appear from external
sources.   1c1

Therefore, we are launching a new approach to ARC's "people
service support operations". The following notes are a start
at outlining some of the changes we are planning.   1d

Main considerations are: 1d1

   Organization   1d1a

   External PSO Specs   1d1b

   Physical Location and Configuration   1d1c

   Terminals   1d1d

   Personnel   1d1e

   Training   1d1f

Outline for Establishing People Service Support Team (PSST) at ARC

ORGANIZATION:

```
                                                              2
                              DPCS (Development)             2a
                            /                               2b
   "users":                /                                2c
    Cat DSS PBMS  NIC  RINS      DPC service (Doc Prod + Control)   2d
    ...............................(ARC + external (NASA I4 +?)     2e
                          /                                 2f
                        /                                   2g
                      PSO (People Service Operations)       2h
    .................................................
```

	2h1
PROCESSES:	2h2
Transcription	2h2a
from voice tapes, handwritten, dictation, published	
materials	2h2a1
using DEX mainly, some TNLS, DNLS	2h2a2
Reproduction	2h2b
Distribution	2h2c
ARC internal - on-line, off-line	2h2c1
NIC - US mail, Other	2h2c2
NASA - Local courier	2h2c3
Journal hardcopy	2h2c4
Journal entry	2h2d
Baseline routines	2h2e
Identification file maintenance	2h2f
Catalog maintenance, and production	2h2g
Routine office tasks	2h2h
NIC station activity	2h2i
Functional document production	
	2h2j

In order to boost the development of the operations group, we are establishing a team - a People Service Support Team (PSST), composed of those people who will be part of the PSO and several others whose experience and training are needed in the formative stages.   2h3

The team aspect of this configuration is essential for developing an effective operational service. The diverse knowledge and experience of the team members, together with their cooperative attitudes will be the keys to success of the effort.   2h3a

A meeting of most of prospective PSST team people was held Thursday, October 28th where DCE introduced the above ideas to stimulate thinking about these plans.   2h3b

Outline for Establishing People Service Support Team (PSST) at ARC

We anticipate that the pusher candidates(s) will be
meeting with many of these people during our search for
the right person.   2h3c

PSST Team: for the next several months   2h4

    ARC:
                                                               2h4a
        Pusher: to operate and further develop team   2h4a1
        JBN   2h4a2
        LLL   2h4a3
        BER   2h4a4
        MEJ   2h4a5
        CXP   2h4a6
        new typist   2h4a7
        DVN (training+)   2h4a8
        MFA (UG, training+)   2h4a9
        BAH   2h4a10
        WLB (catalogs, OP+)   2h4a11
        HGL (DEX+)   2h4a12
    Future additions to the PSO: 2h5
        SRI: 2h5a
            Lelo Kelly +2 others?   2h5a1
        TEMPORARY: 2h5b
            "trained" DEX typists   2h5b1
        NASA: 2h5c
            Several typists at NASA in one or two months?   2h5c1

                                                               2h5c2

EXTERNAL PSO SPECS: 3

   The main objective for the PSST is to get the PSO going, with
primary emphasis on: 3a

     1. Getting the thruput up to meet demands.   3a1

     2. Getting in position to be rapidly expandable (in
thruput quantity) to meet fluctuating service demands.   3a2

       e.g. "no unscheduled waits more than two days .. "   3a2a

     3. Working at minimizing costs while maximizing
responsiveness to customers' needs/values.   3a3

     One of the requirements for the PSST will be to get the
operating procedures documented so that they can be
propagated. This is not the immediate emphasis, however.   3a4

  Some constraints for this effort are: 3b

    Current service can't dip in any serious way.   3b1

    Other current responsibilities of individuals in PSST
aren't removed.   3b2

     PSST membership is an added responsibility.   3b2a

  The external configuration specs and considerations for some
of the initial services are: 3c

    1. TRANSCRIPTION SERVICES   3c1

      Types of work: 3c1a

        Handwritten drafts   3c1a1

        Tape recordings   3c1a2

        Dictation notes   3c1a3

        Offline documents   3c1a4

      Receiving process   3c1b

        Have central receiving station (box, +)   3c1b1

        Have one person or alternate who can handle users'
questions regarding job status, time and cost
estimates, etc,   3c1b2

Outline for Establishing People Service Support Team (PSST) at ARC

Priority determination process   3c1c

    Levels: 3c1c1

        Immediate (1-4 hours)   3c1c1a

        Normal (4-12 hours)   3c1c1b

        Low (a week or two)   3c1c1c

        (rethink time intervals?)   3c1c1d

    Later, the priorities may be established by a
bidding scheme.   3c1c2

Temporary storage of unassigned work   3c1d

    a log system?   3c1d1

    central storage place, organized for control of work
by priority   3c1d2

Assignment process for transcription work   3c1e

    ARC typists --BER MEJ LLL CXP   3c1e1

    Outside "pool"   3c1e2

        Lelo, Kelly, TIA's or Manpower people trained in
DEX, other SRI nearby help?   3c1e2a

Techniques for transcribing: 3c1f

    DEX   3c1f1

        Preferred for most work   3c1f1a

        Should spool pieces of work by priority   3c1f1b

        When and how to enter tapes   3c1f1c

        Where and how long to store entered tapes for
backup   3c1f1d

            (until dump?)   3c1f1d1

        Need conventions for hierarchical statement entry
treatment.   3c1f1e

            When does the transcriber try to put in
hierarchy and when not.   3c1f1e1

Outline for Establishing People Service Support Team (PSST) at ARC

Need conventions for naming of temporary input
files (special and separate for the catalog
process)   3clflf

Instructions from author.   3clflfl

Default conventions if no instructions   3clflf2

TNLS   3clf2

In some cases TNLS will be used, particularly for
high priority items during off-peak load hours,
however, DEX is preferred for most items.   3clf2a

DNLS   3clf3

For otherwise difficult final formatting and
other appropriate tasks.   3clf3a

Techniques for delivery of completed work to the
requester.   3clg

Need an effective procedure for notifying authors
when their work is done.   3clgl

Couriers to NASA Ames?   3clgla

Perhaps input work should be copied to
author's directory in an agreed upon file name
when completed.   3clglal

Or perhaps left in a central pickup
directory with notification to user of its
location.   3clglala

We wish to deliver a draft to the author
for each piece of work (with conventions for
header treatment) as part of the delivery
process,   3clglalb

2. Specs for others to be added soon   3c2

For an outline of procedures that will be developed
(see -- 7681,).   3c2a

Outline for Establishing People Service Support Team (PSST) at ARC

PHYSICAL LOCATION AND CONFIGURATION: 4

  factors: 4a

    - Should be fairly centralized group (ARC people) with
space for temporaries   4a1

    - Should be accessible to console area (telphone answerers
mainly)   4a2

    - Should feel like a group, but not feel excluded from
ARC's other operation   4a3

    Location of Pusher and "control center" should be central   4a4

- Space to use ? :   4b

  LLL, BER part of CXP offices + MFA's old office?   4b1

  Move shop? to computer room area??   4b2

Outline for Establishing People Service Support Team (PSST) at ARC

TERMINALS: 5

    Can use TTY 33's at first   have 5 with paper tape ready all
the time?   5a

    Get 4 or 5 mag tape units on short term lease (3 months?)
RIGHT AWAY.   5b

        SWM to help?   5b1

        If not on-line type, what do we need to read in tapes?   5b2

    SWM to keep looking for "ideal" terminals and get as soon as
possible to replace leased ones.   5c

Outline for Establishing People Service Support Team (PSST) at ARC

PERSONNEL: 6

   Form initial team: PSST   6a

   Get PSO pusher: 6b

      Don Cone, other candidates, -- see and decide   6b1

   Make initial Lelo, Kelly contacts   6c

   Line up temporary help   6d

TRAINING: 7

  Finish DEX Beginner's User Guide (by Friday, 10/29 ?)   7a

    To have two main components-   7a1

  Concise command summary for terminal reference   7a2

  More complete (but for beginners) guide for better basic
undestanding of the process.   7a3

Train BER LLL MEJ first.   7b

  This should equip them to help other new users   7b1

Train PSST team in operational procedures (as developed)   7c

  Catalog process   7c1

  Journal   7c2

  Baseline   7c3

  RINS   7c4

  Transcription   7c5

<JOURNAL>7834.NLS;1, 2-NOV-71 13:34 JCN ; Title: "Author(s): James C.
Norton/JCN; Distribution: Linda L. Lane, Cindy Page, Barbara E. Row, Mil
Jernigan, Jeanne B. North, Dirk H. van Nouhuys, Marilyn F. Auerbach,
Harvey G. Lehtman, Beauregard A. Hardeman, Walter L. Bass, Richard W.
Watson, Charles H. Irby, Ed K. Van De Riet, James C. Norton, Douglas C.
Engelbart/LLL CXP BER MEJ JBN DVN MFA HGL BAH WLB EMC DCE;
Sub-Collections: SRI-ARC EMC; Clerk: JCN;
Origin: <NORTON>J7834.NLS;15, 2-NOV-71 13:27 JCN ; .RTJ=0;
.LSP=0   ;

QUARTERLY MANAGEMENT REPORT 7
(covering the period 9 August 1971 through 8 November 1971)

ARPA Order Number: 967, Program:	1
Title: Network Information Center and Computer-Augmented Team Interaction	1a
Contractor: Augmentation Research Center, Stanford Research Institute	1b
Date of Contract: 9 February 1970	1c
Amount of Contract: $2,410,480	1d
Contract Number: F30602-70-C-0219	1e
Principal Investigator: Dr. Douglas C. Engelbart, phone (415) 326-6200, ext. 2220	1f
Contract Expiration Date: 9 May 1972	1g
	1h

I   RESEARCH PROGRAM AND PLAN   2

As per our proposal and contract, work is progressing in the
following areas: 2a

A. Network Participation   2b

Further development of the Network Operating System   2b1

Development and operational administration of the Network
Information Center (NIC)   2b2

Use by ARC of the Network facilities as they become
available and as appropriate   2b3

B. Team Augmentation Research   2c

Development of a user- and service-system design
discipline   2c1

Management techniques to coordinate augmented design teams   2c2

Special user subsystems to support team collaboration   2c3

C. Computer Facility evolution and maintenance   2d

QUARTERLY MANAGEMENT REPORT 7
(covering the period 9 August 1971 through 8 November 1971)

II   MAJOR ACCOMPLISHMENTS   3

   Network Information Center (NIC)   3a

      An up-to-date TNLS guide has been written (see -- 7470,),
      reproduced, and distributed to Network users. This guide
      contains a complete description of TNLS commands and
      Journal, Identification, and Number System commands in both
      detailed and summary form. It is designed so that as the
      system evolves, it can be easily updated so as to remain
      current and useful.   3a1

      Several training courses for Network users of the NIC and
      TNLS have been held. One such session was conducted
      remotely by ARC personnel from MIT using Network facilities
      to give initial training to about 20 users.   3a2

      As Journal availability has become more reliable, Network
      users have been using it more frequently. This is expected
      to increase significantly as more users are introduced to
      the system and as their habits of use develop.   3a3

      Another feature recently made available to Network members
      is the NIC Locator system.   Locator is document that is
      maintained both on- and offline consisting of links to the
      entire NIC documentation set. The documents currently
      accessible through Locator are: 3a4

         NIC TNLS USER GUIDE (7470,5:mDgct)   3a4a

         NIC JOURNAL USER GUIDE (7635,:x)   3a4b

         NIC TNLS EXERCISE FILES   3a4c

         CURRENT CATALOG OF THE NIC COLLECTION   3a4d

         ARPA NETWORK RESOURCES NOTEBOOK   3a4e

         CURRENT DIRECTORIES OF ARPA NETWORK PARTCIPANTS   3a4f

         ARPA NETWORK RESOURCES NOTEBOOK   3a4g

         CURRENT NETWORK PROTOCOLS (not yet implemented online)   3a4h

         FOLKLORE...day to day information on NLS
         (documentation,folklore,:x)   3a4i

QUARTERLY MANAGEMENT REPORT 7
(covering the period 9 August 1971 through 8 November 1971)

The techniques developed for Locator are currently being
used by other sites (see RFC 274 --7901,).   3a5

Network Status   3b

   Daily use of NIC online services is increasing. At times
   during ARC's service day (0500 to 1800 PST) one may find
   from two to six remote network users logged into the ARC
   system.   3b1

   For the month of October the mean number of simultaneous
   Network users on the system over the Network was 2.5.   3b2

   The mean number of Network Login's per day was 45. This
   figure is somewhat inflated because during the hour 1200 to
   1300 PST, Network uses are forced to Logout and Login
   again.   3b3

   Session length for Network users ranges from approximately
   three minutes (for message sending) to three and four
   hours. A few users have been on the Network for as long as
   six hours per session.   3b4

Dialog Support System (DSS)   3c

   The next stage Identification and Number systems have been
   designed and implemented.   3c1

   Much of the Journal system has been re-written in order to: 3c2

      -Remove many temporary fixes found necessary in the
      evolution of the first system.   3c2a

      -Provide a new and more suitable base from which future
      Journal type systems may easily grow.   3c2b

      -Improve reliability.   3c2c

      -Improve many of the peripheral Journal functions (e.g.
      Hard Copy Distribution) at the user interaction level.   3c2d

   We have participated in an early Network Dialogue meeting
   (at the NWG meeting at MIT), and will probably participate
   in the initial experiments.   3c3

   In coordination with the NIC, the Journal system has been
   modified to handle NWG/RFC Documents and numbers.   3c4

Catalogs   3a

   Documents on the design of automatic control process, data
   elements, and new formatters are in the final stages of
   preparation. (see --8004,), (8005,), (8006,), (8007,),
   (8008,).   3d1

Project Baseline Management System (PBMS)   3e

   The Baseline Management System has progressed, mainly
   through the development of online aids for recording and
   viewing task plans by person, by task, and by activity
   area. We have also continued work on the establishment of
   appropriate operational roles and their integration into
   the planning structure.   3e1

NLS   3f

   Deferred Execution (DEX), a system that provides a means by
   which information may be prepared offline for later
   processing by the ARC computer has been implemented. This
   system will permit many more NIC and ARC users to interact
   with our Augmentation System with the current equipment
   configuration by taking advantage of periods of lower
   user-loading for handling many easily deferred user
   operations. A DEX User guide (see -- 7997,) has been
   written and is in final production stages.   3f1

   New sort-merge-update primitives and commands have been
   written and debugged. These provide much faster and
   flexible response for these operations and will be used
   extensively by both the catalog process and by individual
   users for special applications.   3f2

   Standardization in display and teletype terminals allowed
   DNLS support for IMLAC terminals.   3f3

   Further work was done on the Modular Programming System.   3f4

   A primitive source code level debugging system was planned.   3f5

   A new NLS file system was designed. A basic file system
   will be built, on top of which the NLS file system will be
   constructed.

                                                                       3f6

QUARTERLY MANAGEMENT REPORT 7
(covering the period 9 August 1971 through 8 November 1971)

TENEX	3g
Use of the mouse and keyset in TENEX has been implemented.	3g1
LINK and ADVISE commands have been implemented which enable real time communication among users on the system in both TENEX and in TNLS.	3g2
Input has been enabled for workstations through normal TENEX input/output functions (i.e. teletype mechanism usage).	3g3
File-driven job autostart under EXEC has been implemented.	3g4
Hardware	3h
We have decided on an appropriate initial diskpack configuration and have ordered DEC equipment, due early January 1972.	3h1
III PROBLEMS ENCOUNTERED	4
No major problems	4a
IV FISCAL STATUS	5
Estimated expenditures and commitments to date are: $2,029,000, excluding computer lease commitments.	5a
Estimated funds required to complete the work are: $381,480.	5b
Estimated date of completion of work: February 9, 1972.	5c
V ACTION REQUIRED BY THE GOVERNMENT	6
None	6a
VI FUTURE PLANS	7
Concentration of effort in the following areas is planned for the coming quarter.	7a
A. Network Participation, and further development of the Network Information Center, with particular emphasis on experimental use of NLS by other sites in the Network.	7b
B. Journal and other Dialog Support System development	7c

QUARTERLY MANAGEMENT REPORT 7
(covering the period 9 August 1971 through 8 November 1971)

    C.   Project Baseline Management System development   7d

    D.   Modular Programming System initial development   7e

    E.   Further computer facility evolution, including
improvement of operational efficiency of the PDP-10 and
further organization of the Center to provide reliable service
to the ARPA Network through the NIC.   7f

Submitted by:

D. C. Engelbart   8

Principal Investigator

      9

Approved:

D. R. Brown   10

Director, Information Science Laboratory   11

QUARTERLY MANAGEMENT REPORT 7
(covering the period 9 August 1971 through 8 November 1971)

(J7835) 30-JAN-72 16:39; Title: Author(s): S.R.I. - Augmentation
Research Center, James C. Norton/&SRI-ARC JCN; Distribution: Duane L.
Stone/DLS; Sub-Collections: SRI-ARC; Clerk: JCN;
Origin: <NORTON>J7835.NLS;5, 12-NOV-71 9:48 JCN ;

Proposal for Maintaining an 'Official' system for the NIC and
other outside users

With the opening of the NIC to the network, ARC has a
responsibility to provide a running version of the NLS
system/environment which matches the documentation, and is as
free of bugs as is possible.   1

In the interest of providing such a system, while at the same
time not materially sacrificing our internal flexibility for
changing and experimenting with NLS and NLS related systems, I
propose the following protocol for handling 'Outside Service'
(i.e. NIC) systems.   2

   A system may be in (at least) three states: 2a

      (a) Experimental   2a1

         This is a system which is intended for internal
         consumption only.   2a1a

         It may contain new features which are not in the NIC
         documentation, and bugs, etc. are acceptable.   2a1b

         Depending on the time and the system, ARC may use this
         system for its own work as opposed to the 'Official
         Running' system.   2a1c

         The Journal and related systemss which are invoked in
         this state may be either the real or experimental ones,
         depending on what is being tried.   2a1d

      (b) Under certification   2a2

         Before a system becomes the official running one, it
         must undergo a certification.   2a2a

         It is during this stage that the consistancy of the
         system and the documentation is checked.   2a2b

         A system may not leave the certification stage until
         various persons, preferably other than programmers
         working on the system, have tested it and are satisfied
         that it works according to the documentation.   2a2c

      (c) Official Running System   2a3

         This is the realio trulio running system which is
         offered through the NIC.   2a3a

WSD 18-OCT-71 14:45   7836
Proposal for Maintaining an 'Official' system for the NIC and
other outside users

It has been certified according to (b).   2a3b

The only responsibility programmers will have towards
this system is that of fixing bugs.   2a3c

Design oversights, documented inconsistancies, etc.
should be introduced to the circle at the experimental
system stage, or alternatively (in unusual situations) a
version of the running system may be altered, an must
undergo (at least some degree of) certification again.   2a3d

There will be either two or three copies of the source code
and binary files for the 'NLS' system corresponding to the
three system states as follows: 2b

(a) Experimental system   2b1

The files for the experimental system will be stored
under users NLS and REL-NLS.   2b1a

They will be used in the current manner for making
experimental systems.   2b1b

(b) Official running system   2b2

A set of source and binary files for the current
official running system will be kept under the user
NIC-NLS.   2b2a

They will not normally be modified, except for
bug-fixing.   2b2b

It is up to the programmer fixing bugs to make
corresponding changes in the experimental versions of
the system.   2b2c

(c) System undergoing certification   2b3

When a system is undergoing certification, the source
and binary files for it will be kept under NIC-NLS in
lieu of the files for the running system, which will
have been dumped onto a backup tape.   2b3a

Again, it is the responsibility of the programmer to
make changes in the expeimental system corresponding to
any made in the system under certification (if
relevant).   2b3b

Proposal for Maintaining an 'Official' system for the NIC and
other outside users

Implied in this scheme is a guarantee to the NIC of a bug-free
(almost) system which does not change without notice, as well as
a provision for flexibility at the NLS development level, and a
protection from harrassment for the NLS programming group.   3

   The protection from harrassment is guaranteed by the proviso
   that design errors etc. may not be fixed at the running system
   level.   3a

   If this were not the case, NLS programmers would be the
   subject of an almost endless stream of small re-design tasks,
   which would cause changes in two rather than one system.   3b

   This would inevitably lead to the neglecting of one of the
   systems, which would in turn lead to the nullification of this
   protocol.   3c

Proposal for Maintaining an 'Official' system for the NIC and
other outside users

(J7836)   18-OCT-71 14:45;   Title: Author(s): William S. Duvall/WSD;
Distribution: Marilyn F. Auerbach, Walter L. Bass, Mary S. Church,
William S. Duvall, J. D. Hopper, Charles H. Irby, Harvey G. Lehtman,
Bruce L. Parsley, William H. Paxton, Richard W. Watson, James C. Norton,
Douglas C. Engelbart, Ed K. Van De Riet, Don C. Wallace/mfa npg rww jcn
dce ekv dcw; Sub-Collections: SRI-ARC; Clerk: WSD;

Network Working Group   Richard W. Watson
Request for Comments #273   SRI-ARC
NIC 7837   18 October 1971
Categories:
Related: 7625, 7626, 7661, 7688, 7650, 7646
Obsoletes: 7662   1

                MORE ON STANDARD HOST NAMES   2

The Network Information Center is a logical place to handle this
problem of Standard Host Names and so the ball now rests here.
This is clearly a delicate subject with people having strong
feelings and attachments to names. No past proposal, including
RFC 247, NIC 7688, has yet achieved any acceptance. This
identification seems a natural thing and should be taken into
account in setting up a naming scheme. Therefore, the following
proposal is offered which I hope may be satisfactory to everyone.   3

Any naming scheme must: 4

   (1) Recognize the expanding character of the Network, with
   the potential eventually of several hundred sites.   4a

   (2) Recognize the need for abbreviations to simplify typing.   4b

   (3) Recognize the use of names on hardcopy and online
   documentation.   4c

   (4) Recognize people's strong identification with historical
   names associated with their project.   4d

To meet these needs, we propose adoption of a hybrid scheme
related to those in the other past proposals.   5

Each host will have a formal name of the form: 6

   <Institution Mnemonic>   "-"   <Host or NIC Station Mnemonic> 6a

   and an optional nickname of the form:

                                                                   6b

                  <Nickname>   6c

We have heard no arguments to support severe restrictions on name
length and, therefore, human considerations should probably
prevail, but would suggest the following guidelines.   7

   <Institution Mnemonic> will be at most 4 characters, formed as
   per RFC 247, NIC (7688,).   7a

Examples of Institutions being: AMES, CASE, BBN, UCLA,
SRI, MIT, HARV, MITR, etc.   7a1

We must recognize that in the future there may be multiple
IMPS and TIPS and combinations at a given institution, so
that there is not a one-to-one correspondence between
<Institution Mnemonic> and IMPS or TIPS. Also affiliated
with the Network, there will be groups and individuals
without an IMP or a TIP, or with just a terminal to a TIP,
whose organizations need unique names.   7a2

<Host or NIC Station Mnemonic> will not have any restriction
on length, but should if possible be short. In picking <Host
or NIC Station Mnemonic>, an order of priority for choosing
this mnemonic might be   7b

  (1) Suborganization within the <Institution Mnemonic>.   7b1

  (2) Project mnemonic.   7b2

  (3) Machine designation.   7b3

  (4) The suggestion in RFC 247, NIC 7688 to include the
  designation TIP or TEST should probably be followed as
  conveying useful information.   7b4

  Examples might be: 7b5

    ARC, NMC, NCCTIP, TENEXA, TENEXB, MULTICS, ILLIAC, SAIL,
    DMCG, IMP, TX2, etc.   7b5a

The <nickname> should be unique within the network community,
short, and preferably should be the same as <Host or NIC
Station Mnemonic> to make life easy for people having to learn
them.   7c

I would strongly recommend that Telnets recognize both the Formal
Name and the Nickname.   8

Now the sticky question: Who chooses the names? The only
satisfactory answer is to allow the hosts, through their liaison,
to choose their own names, possibly subject to some discussion if
duplicate or extra long names are picked. Hosts or stations at a
given institution should use the same <Institution Mnemonic>.   9

Let's settle this issue as soon as possible, say by November 5;
each liaison, please send me your names by then.   10

If there are any implementation hardship cases, other than TIPs,

caused by the above scheme, please let me know as soon as
possible.   11

(J7837) 21-OCT-71 8:46; Title: Author(s): Richard W. Watson/RWW;
Distribution: Steve D. Crocker, Thomas F. Lawrence, John W. McConnell,
John F. Heafner, Robert E. Long, Ari O. J. Ollikainen, James E. White,
A. Wayne Hathaway, Dan L. Murphy, Patrick W. Foulk, Richard A. Winter,
Harold R. Van Zoeren, Alex A. McKenzie, Robert L. Sundberg, James M.
Madden, Joel M. Winett, Abhay K. Bhushan, Peggy M. Karp, Thomas N. Pyke,
Abe S. Landsberg, B. Michael Wilber, James A. Moorer, Edward A.
Feigenbaum, Robert T. Braden, James M. Pepin, Barry D. Wessler, John T.
Melvin, John C. LeGates, Art J. Bernstein, C. D. Shepard, Robert F.
Hargraves, EMA/nwg; Sub-Collections: NIC NWG SRI-ARC; RFC# 273; Clerk:
RWW;

The State-Changing Problem for Remote Computers

There is a logical problem associated with synchronizing a remote
device with internal state (such as an IMLAC) with the central
machine it serves.   1

    This note gives an example of this problem, attempts to
    characterize it, and indicates three workable but ugly
    solutions in the hope of stimulating further thought on the
    subject.   1a

Consider an IMLAC being used as a terminal for NLS. Let us
suppose that besides its normal full-duplex mode, in which typed
characters are sent to the host but have no local effect, the
IMLAC is also able to collect a literal (text string, file name,
...).   2

    Let us further assume that the IMLAC does not know when a
    literal input is required, but only performs this function on
    command from the host.   2a

Now suppose that the user types the following string of commands
[the machine's intended responses are in brackets]:   3

    I[nsert] C[haracter] <bug>[<mark> <start literal>]   3a

    x y z <CA>[<end literal> <redisplay statement>]   3b

    U[pdate file (new version) <file name>] <CA>.   3c

When the host receives the <bug>, it asks the IMLAC to collect a
literal.   4

    However, the proficient user will often have typed ahead of
    the host's ability to respond: some or all of the literal x y
    z may already be present in the host's input buffer (or, for
    that matter, the IMLAC's keyboard input or host output
    buffer).   4a

    Thus, the IMLAC will not be able properly to display these
    characters as part of the literal unless other machinery is
    provided.   4b

First proposal: 5

    The IMLAC never sends a character to the host spontaneously,
    but always waits for a request. This is simple, but may
    double the character traffic and greatly increases the number
    of wakeups of the host.   5a

Second proposal: 6

    The IMLAC has the ability to accept characters from the host
and put them at the head of its keyboard input buffer. The
host also can send a command which produces a response from
the IMLAC and prevents the IMLAC from sending further keyboard
characters.   6a

    Then to collect a literal, the host sends this command; waits
for the IMLAC's response; and sends back to the IMLAC all the
characters that arrived at the host before the response, to be
put on the front of the keyboard buffer.   6b

        This approach only involves one more wakeup, but it assumes
at least that the IMLAC can recognize the end of a literal.   6b1

Third proposal: 7

    Besides the ability to put host characters at the front of the
keyboard queue, the IMLAC retains a few characters in its
input buffer after it has sent them, enough to cover the
round-trip transmission time and the worst-case host response
time (for a response time of 5 seconds, this might be 32
characters for a reasonably fast typist). The IMLAC also
sends a sync message every N characters, say N=20, with a
serial number whose recycling period is long compared to a few
seconds.   7a

    Then when the host wants to collect a literal, it tells the
IMLAC to reinterpret input starting at character i past sync
message j (this being the character that triggered the literal
request), and throws away all input until the literal arrives.   7b

        This approach involves no extra wakeups and only a small
percentage overhead in character traffic. It too requires
the IMLAC to be able to recognize the end of the literal
and also requires setting a response time bound above which
characters may be lost.   7b1

The requirement in the second and third schemes that the IMLAC be
able to recognize the end of a literal can be removed by using
the same mechanism to control the state change in the other
direction.   8

    However, this may result in some characters appearing
temporarily in the literal area that do not belong there.
This problem did not appear in the other case, since
characters are normally not echoed.   8a

We see that there are actually two problems to be solved here.   9

   The first is to prevent erroneous feedback to the user.   9a

      The only apparent solution is to provide the IMLAC with
enough information to be able to recognize at least those
state changes where the old state involves echoing, and
either make the proper state change itself or go into a
default state where nothing is echoed.   9a1

   The second is to ensure that the IMLAC interprets input
characters in the proper context when echoing is involved.   9b

      The proposals above are aimed primarily at this
synchronization problem.   9b1

(J7839) 20-OCT-71 11:32; Title: Author(s): L. Peter Deutsch/LPD;
Distribution: Steve D. Crocker, Charles H. Irby, Mary S. Church, William
H. Paxton, J. D. Hopper/sdc2 chi msc whp jdh; Sub-Collections: NIC;
Clerk: LPD;
Origin: <DEUTSCH>NETLOOP.NLS;4, 20-OCT-71 11:07 LPD ;

sample use of journal.

this is to log in ernie forman to nls.   1

sample use of journal.

(J7840)   20-OCT-71 14:10;   Title: Author(s): Madge B. Cornell/MBC;
Distribution: Madge B. Cornell/mbc; Sub-Collections: NIC; Clerk: MBC;

This continues the series of skelatal bullitins on new NLS
systesm (7683,).   1

<div align="center">SEARCH FOR STATEMENT NAME</div>   2

    In the past, the routines that searched for statement names
started at the current statment and searched to the end of the
file. They have canged so they search the whole file, with
the following consequences: 2a

    IN DNLS   2a1

        The jump-to-name command ues the old routines. Jump to
name first goes to the first example of the name after
the origen statement statement.   2a1a

            Syntax: j n f SP/bug CA   2a1a1

        Jump to name next jumps to the first example of the name
after the current statement.   2a1b

            Syntax: j n n SP/bug CA   2a1b1

        All other uses of statement names simply find a
statement with that name ---independent of relative
location in the file. Hence, if you have a problem of
two or more identical names in the same file, you should
use jump to name.   2a1c

    IN TNLS   2a2

    f (7683,4n) no longer controls the search for statment
nammes. If you type f after a statement name, as you did in
the pas,t to make the search start from the beginnning of
the file, you will get an error message.   2a3

    The device analogous to DNLS jump to name is .*name. The
askrisk instucts the search to begin at the current
statment. Hence the command to move to the next example of
a name is: 2a4

        Syntax: SP .*name CA   2a4a

NO ASTRISKS BEGINNING STATMENT NAMES   3

    Because of the above, statment names may no longer begin with
astrisks.   3a

XSET WORKS   4

   Xset works now for all structural entities.   4a

VIEWCHANGE   5

Viewchange (7474,5) now works for all controll characters, but
only for control characters. That is, you can change CA to 3,
but not 3 to 4.   6

SEARCH SIGNITURES FOR CONTENT   7

   The following new constructs in L10 permit you to search
   statement signatures.   SINCE(date:time)
                        BEFORE(date:time)
                        ID=XYZ
                        ID#XYZ   7a

   The date and time must have the foremat they have in statement
   signatures.   7b

(J7843) 20-OCT-71 15:11; Title: Author(s): Dirk H. van Nouhuys/DVN;
Distribution: Robert E. Kahn, L. Peter Deutsch, James G. Mitchell, Alan
C. Kay, Marilyn F. Auerbach, Walter L. Bass, Mary S. Church, William S.
Duvall, Douglas C. Engelbart, Beauregard A. Hardeman, Fred P. Hocker,
Martin E. Hardy, J. D. Hopper, Charles H. Irby, Mil Jernigan, Harvey G.
Lehtman, John T. Melvin, Jeanne B. North, Bruce L. Parsley, William H.
Paxton, Barbara E. Row, Ed K. Van De Riet, Dirk H. van Nouhuys, Don C.
Wallace, Richard W. Watson, Don I. Andrews, James H. Bair, Duane L.
Stone, Thomas F. Lawrence, Stan L. Mantiply, John W. McConnell, David M.
Grothe, Alex A. McKenzie, Dirk H. van Nouhuys/rek2 lpd jgm ack mfa wlb
msc wsd dce bah fph meh jdh chi mej hgl jtm jbn blp whp ber ekv dvn dcw
rww dia jhb dls tfl slm jwm dmg aam DVN; Sub-Collections: SRI-ARC;
Clerk: DVN;
Origin: <VANNOUHUYS>NLSJOURDRAFT.NLS;2, 20-OCT-71 14:59 DVN ;

For TENEX User Group

SCHEDULER OPERATION   1

States of forks ("forks" and "processes" are here used
interchangably)   1a

Every fork in the system is in one of the following states: 1a1

On the wait list.   1a1a

When on the wait list, a fork has associated with it
a test routine and data (half) word. The routine
will tell the system if the wait condition is
satisfied. The routine expects the half-word argument
in the right half of one. The calling sequence in
JSP 4,- with a skip or no skip return.   1a1a1

The data and routine address are in the left and
right half of FKSTAT[i] for fork i.   1a1a1a

The clock reading (a TODCLK image) at the time it was
put into a waiting state is also stored so that the
waiting time can be computed. (used by NEWST to
recompute the fork's queue number and quantum).   1a1a2

The clock reading is stored in FKPGST.   1a1a2a

Forks get on the wait list when they are dismissed
for TTY (input or output) wait, waiting for another
fork, or for hardware such as the punch, printer,
etc.   1a1a3

Forks that read pages from the disk (which end up
page faulting) are not put on the wait list but
generally remain in the balance set.   1a1a3a

<SRI-MOD> Forks that page-fault on disk pages
are removed from the balance set unless the
disk is free.   1a1a3a1

On the go list.   1a1b

These forks are runnable.   1a1b1

<SRI-MOD> Associated with it is the time it was put
on the go list.   1a1b2

This is used only by the SRI-ARC statistics
gathering stuff to compute the time to be brought

into the balance set, as an index of system
response.   1a1b2a

The clock reading is stored in FKPGST.   1a1b2b

In the balance set.   1a1c

A fork in the balance set is either: 1a1c1

running   1a1c1a

runnable but not running   1a1c1b

in a page wait state (waiting for a page that it
faulted on)   1a1c1c

The status of such forks in stored in FKPGST in
the form test data,, routine address.   1a1c1c1

or designated for removal but not really removed
because it is waiting for a page. Such a fork
will be put on the go list when the page gets in.
These forks are not really in the balance set so
far as taking up memory is concerned.   1a1c1d

This is done this way, I think, so that the
forks page table will be in core when the
interrupt routine cleans things up after the
page gets in.   1a1c1d1

Representation of states   1a2

The status of a fork is kept in FKSTAT. When runnable,
the left half is a queue number and the right half is
the queue time. When on the wait list, FKSTAT contains
a fork's test data and routine as described.   1a2a

When a fork is moved from a runnable state to the
wait list, its running status is moved to FKOLDS.   1a2a1

Forks on the wait or go lists are really on a link-list.
The pointer to the next fork on the list (after fork i)
is in FKPT[i].RH. The left half of FKPT has the name of
the list in it.   1a2b

Forks in the balance set are listed in a table of fork
numbers rather than link-listed together. The table is
indexed by a balance set process number which, for fork

2

i is kept in FKPT[i].RH if the fork is in the balance set.   1a2c

BALSET contains the fork number and several flags, A parallel table, NBT, contains the runtime in the balance set (in ms.) for that fork. See (BALSET).   1a2c1

Associated with each fork in the system: 1b

Queue number.   1b1

There are five queues in the system (0 - 4). Every fork in the system has a queue number.   1b1a

The queue number is in the left half of FKSTAT[i] for a runnable fork, and in the left half of FKOLDS[i] for forks on the wait list.   1b1a1

The queues are not really queues and behave only vaguely like queues.   1b1b

Queue quantum.   1b2

With each of the queues there is a time or quantum.   1b2a

(QBASE[q] - QBASE[q+1]) is quantum length for queue q in ms.   1b2a1

When a fork is placed on a queue, its queue time is set to a full quantum (as indicated by the QBASE table). As the fork runs, its queue time is reduced by the running time.   1b2b

The queue time is kept in the right half of FKSTAT or FKOLDS.   1b2b1

When a fork exhausts its quantum it is put on the next queue and again given a full quantum (probably different). Forks on the last queue are put on the "end" of the last queue again on quantum overflow, i.e. the time on queue is reset and the quantum is reset to a full queue 4 quantum.   1b2c

The queue time is in the right half of FKSTAT[i] or FKOLDS[i] (as for the queue). The number stored is actually QBASE[q]+R where R is the remaining runtime in his quantum in queue q.   1b2d

The scheduler will move forks to higher queues for a
variety of reasons.   1b2e

Time on queue.   1b3

When a fork is put on a queue, the clock reading is
recorded so that the real time on that queue can be
computed.   1b3a

(in FKTIME[i])   1b3b

This is used in computing the scheduling priority for
that fork.   1b3c

Working set parameters.   1b4

Every fork has: 1b4a

WS, the number of pages in memory assigned to the
fork in question (working set).   1b4a1

(in FKWSP[i].RH)   1b4a1a

This number is likely to dwindle to nothing when
the fork is not in the balance set.   1b4a1b

NR, the system's estimate of the number of pages in
WS when that fork is running.   1b4a2

(in FKNR[i].RH)   1b4a2a

This number is used to prevent over-committing
memory.   1b4a2b

Tav, the average time in ms. between page faults for
that fork.   1b4a3

(in FKWSP[i].LH)   1b4a3a

(This parameter is not accurate if the actual time
between page faults in ms., is small compared to
the number of pages in the working set. It ends up
near zero due to the way the average is computed.
However, the system only takes action when Tav is
large -- see page faulting discussion).   1b4a3b

The priority scheme.   1c

Scheduler Operation

The only thing that makes the queues really behave at all
like queues is the priority scheme.   1c1

Basically, every fork has a priority that is constantly
changing in real time. While on a given queue, a fork's
priority increases in real time at a rate depending on the
queue number and TFACTR[q], but independent of how much it
runs.   1c2

The highest priority is zero, and the larger the priority
number, the lower the priority.   1c3

   The priority is computed when needed by CORFCT.   1c3a

The initial priority when placed on a specified queue and
the rate of increase are determined by the following: 1c4

   TBASE[q] contains the initial priority, i.e. TBASE[q] is
   the priority of a fork that has been on queue q for
   zero ms.   1c4a

   The priority number decreases in time to zero (high
   priority) at the rate of $2\uparrow f[q]$ where $f[q]$ is zero or
   negative.   1c4b

      Hence the priority increases at a fraction of real
      time, unless $f[q]$ is zero, in which case it increases
      at real time.   1c4b1

      (f is actually called TFACTR)   1c4b2

   That is, the priority is determined by   1c4c

      $TBASE[q] - t*2\uparrow f[q]$ 1c4c1

         Where t is the real time on queue q.   1c4c1a

Generally, the higher the queue number, the higher the
initial priority number (lower the priority) and also,
the slower the rate at which that priority number
decreases (priority increases).   1c4d

Notice that when a fork uses up its quantum and goes to
a higher queue, its priority is reduced.   1c4e

But it is possible to have a compute-bound job with a
priority higher than a job just put on queue zero --
which is not possible on a system with strict queueing.   1c4f

In summary, forks are not queued but run on a priority
system. A fork's priority is determined by two
variables: the queue number and the real time it's been
on that queue.   1c4g

Generally, the scheduler is invoked in two ways: 1d

The scheduler is invoked when the current running fork can
no longer be run for some reason.   1d1

The primary entry point for the scheduler is the EDISMS
(monitor) JSYS.   1d1a

The JSYS expects a status word in one (i.e. data half
word,, test routine adr).   1d1a1

The running fork is put on the wait list until the
condition satisfied.   1d1a2

Rescheduling of course is necessary.   1d1a3

The SCHEDP <monitor) JSYS is used to enter the scheduler
on a page fault.   1d1b

The current running fork is removed from running, but
not removed from the balance set. A status word is
provided as for EDISMS, but is stored in FKPGST[i],
and is used to find out if the page has come into
core yet.   1d1b1

An SRI-ARC mod causes the fork to be "designated
for removal" if it faulted on a disk page. This
was done because we have a slow disk and high disk
usage. The fork remains in the balance set if the
disk queue is "short."   1d1b1a

The RSKEDO (monitor) JSYS is used to invoke the
scheduler after scheduling has been turned off.   1d1c

Scheduling may be turned off with the NOSKED macro,
and then turned on again with the OKSKED macro. If
scheduling has taken place in the mean time, the
RSKEDO JSYS is executed in the OKSKED macro.   1d1c1

Location RSKED contains normally a JFCL. If the
channel seven interrupt code finds scheduling
turned off when it goes to call the scheduler, it

6

sets RSKED to a JSYS RSKEDO. and returns. The
OKSKED macro simply executes RSKED.   1d1c1a

Also, the scheduler is invoked by way of the channel seven
interrupt.   1d2

The 60Hz interrupt and the channel seven interrupt.   1d2a

The 60Hz clock interrupt is used primarily to
regulate the 1 ms. clock, but it is also used to
generate a channel seven interrupt in order to do
scheduler clock updating in a low priority interrupt.
A flag is set (APCLKC) to indicate the clock tick to
the channel seven code.   1d2a1

The channel seven code (PISC7) will JRST to the code
at APCLK to update the scheduler clocks. If any
clocks run out, ISKED is set and the channel seven
code will enter the scheduler.   1d2a2

Other uses of the channel seven interrupt: 1d2b

The channel seven interrupt is used as a way of
entering the scheduler.   1d2b1

For example, when a page read is completed, the
drum interrupt code generates a channel seven
interrupt. The scheduler will be entered then if
ISKED has been set. Hence a page coming in will
cause rescheduling only if there is another reason
to reshcedule also.   1d2b1a

It is reasonable to use the channel seven
interrupt to invoke rescheduling (by setting ISKED
first).   1d2b1b

The scheduler loop.   1e

Some of the flags used by the scheduler are: 1e1

ISKED is set by various monitor routines to indicate
that the scheduler should check all waiting jobs because
one of them may be runnable due to some event.   1e1a

SKEDF2 is set by a scheduler routine called SCHED1 which
checks all waiting jobs for ready status. It is set
only when a fork has been moved from the wait list to

7

the go list (and thus should be considered as a balance set candidate).   1e1b

SKEDF1 is set to exit the scheduler and run the current fork (this is done via the channel 7 interrupt at PISC7).   1e1c

PSKED is set when a page read is completed. It means that a balance set fork in page-wait may be runnable.   1e1d

The following pseudo-program contains the essence of the scheduler loop.   1e2

  (SCHEDO)   1e2a

    Execute scheduler clocks if time has run out   1e2a1

      qntdms - quantum overflow dismis   1e2a1a

        essentially does a DISMSJ to remove current running fork from running (does not remove it from balance set)   1e2a1a1

      skdlv8 - imp and big tty buffer service   1e2a1b

      clk2 - job zero check and device check for disk, tape, punch, etc.   1e2a1c

    Execute scheduler requests if any   1e2a2

      "start a new job" is only request type at this time   1e2a2a

    If ISKED set, call SCHED1 to test all waiting jobs   1e2a3

    If SKEDF2 or PSKED set, call DISMSJ   1e2a4

      DISMSJ is a bookeeping routine that removes the current fork from running.   1e2a4a

    If switches request, do it by calling SWTST   1e2a5

      (requests are deposited in location 20 octal)   1e2a5a

    If there is no fork-in-running, call SKDJOB to get one   1e2a6

    Continue running fork   1e2a7

done by setting SKEDF1 and triggering channel seven interrupt.	le2a7a
(SCHED1)	le2b
For all waiting jobs	le2b1
call test routine with data	le2b1a
skip return: call NEWST	le2b1a1
NEWST uses waiting time to recompute queue number, quantum, time on queue. Essentially, it boosts priority.	le2b1a1a
It also sets NR to a minimum (actually, MIN(3,WS) is used). This is to indicate a lack of knowledge about the WS of a fork that has blocked.	le2b1a1b
Set SKEDF2.	le2b1a1c
otherwise continue loop	le2b1a2
Return	le2b1b
(SKDJOB)	le2c
Do a core garbage collection	le2c1
see (GCCOR) -- will not do anything unless it is necessary.	le2c1a
Is memory overcommitted (sum of NR for all balance set forks > max , actually SUMNR>MAXNR) or number of balance set forks over max?	le2c2
If so, remove a fork by calling REMJOB	le2c2a
REMJOB picks the fork with MAX priority number from CORFCT, but does not remove anyone who has been running in balance set less than WS*BTFACT ms.of runtime.	le2c2a1
It is possible for REMJOB to return with no forks removed.	le2c2a2
If there are no forks just entering the balance set	

and there is a fork waiting to enter (on the go
list), THEN   1e2c3

    load a fork by doing a GOTO LDJOB (a label)   1e2c3a

(SKDJ7)   1e2c4

    Reset PSKED (to detect recent page read completes) 1e2c4a

    Select the best runnable fork in BS, i.e. minimum
    priority number from CORFCT.   1e2c4b

        At the same time, test forks in page wait to
        see if their page has come in. If so, they are
        considered in the priority selection. Remove
        forks that are designated for removal if their
        page has come in -- put them on the go list.   1e2c4b1

        At this point, if any page transfers have
        finished (PSKED set), GOTO SKDJ7   1e2c4b2

    Setup to run selected process   1e2c4c

    If there are no forks to run: 1e2c4d

    Run the system checks that are normally
    clocked.   1e2c4d1

        skdlv8 and device checks   1e2c4d1a

    charge the time to IO wait (SKDTM1) if there
    are forks in the balance set, otherwise charge
    it to idle (SKDTMO)   1e2c4d2

    and take it from the top (GOTO SCHEDO)   1e2c4d3

   RETURN   1e2c4e

(LDJOB)   1e2d

   Select the best of ready forks by calling SCDRUN   1e2d1

      SCDRUN will call CORFCT to find the fork on golist
      with MIN priority number   1e2d1a

   load the fork into the balance set if   1e2d2

it is better (priority number lower than) the
worst fork now in balance set   1e2d2a

OR if there is room for one more fork in balance
set   1e2d2b

AND the sum of reserved pages plus his will fit
1e2d2b1

AND there are enough free pages to load PSB,
JSB and UPT for him   1e2d2b2

to load the fork, get him into the balance set tables
and initiate the reads to get in his PSB, JSB and UPT
if the're not in already. They get locked.   1e2d3

If you loaded a fork, GOTO SKDJOB   1e2d4

Otherwise GOTO SKDJ7   1e2d5

A brief glossery of scheduler tables   1f

The contents of the most frequently used scheduler
variables are given here. Tables indexed by process number
are indicated by [i], tables index by job number by [j],
and tables indexed by balance set process number are
indicated by [b].   1f1

(FORKX) Contains the index of the currently running
fork.   1f1a

(FKPGS) [i] Contains SPT page numbers for the forks page
table,, PSB   1f1b

(FKSTAT) [i] Contains the fork's status. Queue number,,
queue time when runnable and data half word,, test
routine addr when on the wait list.   1f1c

(FKWSP) [i] Contains the working set parameters: Average
time between page faults,, number of pages in real core
at this time.   1f1d

(FKPGST) [i] Contains data half word,, test routine addr
for a balance set fork in page wait. Contains the time
(TODCLK immage) that the fork was put on the wait list
while waiting.   1f1e

(FKOLDS) [i] Contains the contents of FKSTAT[i] when
last put on the wait list.   1f1f

(FKPT) [i] A pointer which contains various things
depending on the state of the fork: lflg

   wait list: WTLST,, index of next fork on the wait
   list, or zero.   lflg1

   go list: GOLST,, index of next fork on the go list or
   zero.   lflg2

   balance set: balance set process number (index into
   BALSET).   lflg3

   free fork list: index of next fork on the free list.   lflg4

(FKINTB) [i] Contains interrupt channels request bits.   lflh

(FKJOB) [i] Contains job number for the fork,, SPT
number for jobs's JSB.   lfli

(FKNR) [i] Contains current age for fork's pages,, NR or
number of pages to be reserved for this fork when
running (estimate of WS). The age is stored in the
pager's age register when the fork is running.   lflj

(FKTIME) [i] Contains the time (TODCLK immage) when the
fork was put on the queue it is now on.   lflk

(JOBDIR) [j] Contains attached director,, login
directory for this job.   lfll

(JOBNAM) [j] Contains the subsystem name index for this
job -- set by the last call to SETNM JSYS. It is an
index into SNAMES and parallel tables.   lflm

(JOBRT) [j] Total runtime accumulated for this job in
ms.   lfln

(JOBPT) [j] Contains controlling TTY line number,, top
fork index, or job index of next free job for free
entries.   lflo

(FREJOB) Starting job index for list of free jobs.   lflp

(WTLST) Starting fork index for list of forks on wait
list.   lflq

(GOLST) Starting fork index for list of forks on the go
list.   lflr

(WTLSTL) Fork index of last fork on the wait list.   1fls

(GOLSTL) Fork index of last fork on the go list.   1flt

(BALSET) [b] flags,, fork index for balance set process
number b.   1flu

    BALSET flags: 1flul

       BALSET is -1 if not used   1flula

       0: runnable if 0, not if 1   1flulb

       1: ?   1flulc

       2: unused if 1, used if 0 (tested at SKDJ3)   1fluld

       3: desginated for removal if 1   1flule

(NBT) [b] The runtime in ms. for balance set process
number b, since it entered the balance set.   1flv

(FBALS) Contains the highest balance set slot in use +1.   1flw

(NBPROC) Contains the number of forks in the balance
set.   1flx

(NGOJOB) Contains the number of forks on the go list.   1fly

(NRPLQ) Contains the number of pages on the replacable
page queue.   1flz

Scheduler parameters and their functions   1g

The following parameters affect scheduling either directly,
or by affecting memory management policies. Parameters
that may be changed at runtime without ill affects are
indicated by (R).   1g1

(QBASE) The five queue quantum lengths (in ms.) are in
QBASE+1 to QBASE+5. QBASE contains a zero. Each QBASE
number is the quantum length for the corresponding queue
PLUS the previous QBASE number. Hence, QBASE[i+1] -
QBASE[i] is the quantum length for queue i.   1g1a

(TBASE) (R) The five initial priority numbers for the
five queues are in TBASE to TBASE+4.   1g1b

(TFACTR) (R) The priority time factors for each queue
are contained in TFACTR to TFACTR+4. The expression for
the priority of a fork on queue q for t ms. is TBASE[q]
- t*2↑TFACTR[q].   1g1c

(BTFACT) (R) The balance set time factor has the units
ms/page and determines the minimum length of runtime a
fork will remain in the balance set. REMJOB will not
remove a fork with runtime less than BTFACT*FKWSP[i].RH
which is BTFACT*WS.   1g1d

(PTAV) (R) The Tav parameter is the maximum reasonable
ms. between page faults. IF a fork page faults on a
not-in-core page, and its Tav (which is FKWSP[i].LH) is
greater than PTAV, his working set is reduced in size to
make him fault more frequently.   1g1e

(TOTRC2) (R) This represents the maximum real core
available to a fork when other runnable forks are
around, in pages. If a fork faults on a not-in-core
page and its WS (which is FKWSP[i].RH) is greater than
TOTRC2, his working set is reduced.   1g1f

(NPMAX) (R) This represents the same thing as TOTRC2,
except for the special case when only one runnable fork
exists. It is generally set just slightly smaller than
the number of user core pages available.   1g1g

(NRPMIN) (R) This represents the minimum number of pages
which should be maintained on the replacable page queue.
The core garbage collector will not do a collection
unless the number of pages on the replacable queue is
below this number, or an essential GC is requested.   1g1h

(MAXNR) This is the maximum value for the sum of
reserved pages of balance set forks (SUMNR), and
indicates if memory is overcommitted or not.   1g1i

14

(J7845) 20-OCT-71 16:03;   Title: Author(s): Don I. Andrews/DIA;
Distribution: Don I. Andrews/dia; Sub-Collections: SRI-ARC; Clerk: DVN;
Origin: <VANNOUHUYS>SCHED.NLS;3, 20-OCT-71 16:00 DVN ;