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THE BASIC NLS-8 COURSE OUTLINE

SRI-ARC

6 JUN 75

Applications Development

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BASIC TNLS-8 COURSE OUTLINE

This is the seventh release of the first course in NLS with refinements. It was designed by ARC to be minimally complex and yet contain the commands necessary to enable a user to enter, edit, and 'mail' text. Course completion time ranges from 1 to 2 days with a qualified trainer. Printed copies are available from Trainers, Feedback, or JHB.

BASIC TNLS-8 COURSE OUTLINE

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THE BASIC TNLS-8 COURSE OUTLINE

INTRODUCTION TO NLS

NLS = oN Line System

TNLS = Typewriter Version

CAPABILITIES OF SYSTEM:

- Composing
- Editing
- Studying
  - Structuring
  - Browsing - viewing
- Printing
- Publishing
- Communicating -
  - sending and receiving mail, messages, documents; teleconferencing; etc.
- Storing and retrieving -
  - record keeping, library services, data bases, searching, etc.
- Calculating

SOME NOTES

**This is designed for use when terminals are available for all participants to use/view easily. It is intended to be the first course a person receives on NLS. The commands are shown as they would appear with partial prompting.

COURSE ORGANIZATION

The course is organized by concepts of what a user can do with

TNLS at this level. The seven concepts [listed below] are ordered as one would need them to use the system. Under each concept are the exact commands that instruct the computer to perform the function that goes with the concept. There is a command summary at the end of the course outline that lists the same commands alphabetically for easy reference.

The commands which are included in this first course have been selected to let a user write, edit, store, and communicate typewritten information [text]. Those commands numbered with a (2) are to be covered on the second day of the course.

TNLS CONCEPTS: [Things you can do as covered in this course:]

1. FILES FOR STORAGE
2. TYPING IN INFORMATION
3. TYPING OUT INFORMATION
4. EDITING
5. COMMUNICATING
6. ADDRESSING
7. TROUBLE SHOOTING AND HELP

DEFINITIONS FOR THE COURSE OUTLINE

COMMANDS: You typing some characters to tell the computer what to do.

<SP> means strike the SPACE bar.

Upper case characters in a TNLS command phrase are what you type.

Words that are all in uppercase represent something appropriate that you type.

TYPEIN = a string of characters from the keyboard, ending with an OK.

OK: means you type a carriage return, indicated by a CR.

CR = strike the carriage return key

WHERE YOU ARE: Where the computer thinks you are pointing to [to some character in some file]; you tell it by specifying an address; this is where your command will be done.

CTRL = hold down the control [CTRL] key while typing the specified character.

BASE C: = the TNLS ready signal. It means that you can type in an editing or file-handling command [like home base...].

SEND C: = the Sendmail subsystem ready signal. It means that you can type in a Sendmail command.

GETTING TO NLS

THE TERMINAL AND USE [if dialing in]

If dialing in, turn on, dial TIP number, place receiver in cradle after hearing tone, and make sure terminal is online.

NETWORK [if used]

Net login: Brief Summary for dial in users [Steps are numbered]

[I] Type E [to get the Network's attention]

[II] Type @ C <SP> 43 CR [to Open a connection to Office-1,Host 43]

You now should be connected to TENEX

TENEX Executive

Login procedure:

[III] type your USERNAME <SP> PASSWORD <SP> CR [the last SPACE fills in account number automatically; you're then ready to call NLS]

(2) Group allocation quota:
GROUPSTAT CR [to see who else is using your slot]

Calling NLS:

[IV] Type NLS CR

(2) To get back to TENEX :

BASE C: Quit OK/C: Nls OK: CR
[under most conditions you may continue in NLS by typing CON CR]

To leave the system, logout in NLS:

BASE C: <SP> Logout OK: CR

To close the network connection:

@ C CR

BASIC TNLS:

Abort Commands = CTRL x [kills the command before the final CR]

1. FILES

The origin statement
[no number, contains the file name - don't edit]

The initials file -- automatically your first file, named after your initials [also one of your mailboxes]

New files

BASE C: <Sp>CReate C: File T: FILENAME CR
(DIRECTORY, FILENAME.NLS;1,)

[any short "word", like a folder label]

(2) To see a list of all your files: Show Directory:

BASE C: <SP>SHow C: Directory (of) T/OK: CR OK: CR OK:

(2) To work in another file:

BASE C: Load C: File T: FILENAME CR

2. TYPING IN INFORMATION

Insert Statement

BASE C: Insert C: Statement (to follow) A: ADDRESS CR L: CR
T: TYPEIN CR

[TYPEIN means you type in whatever you want in the statement; ADDRESS = statement number]

(2) Continue to insert by typing CTRL e instead of CR for final OK:

[Puts you in the "Enter mode" -- you type CR to end each statement, when finished type a CTRL x after the L:]

backspace character = CTRL a
backspace word = CTRL w

(2)Insert Text at the end of a statement

(2)BASE C: Insert C: Text (to follow) A: +e CR T: TYPEIN CR

[+e means the end of the statement]

3. TYPING OUT INFORMATION *To stop printing type a CTRL o

[takes some time to get through!!]

Printing the file:

BASE C: Print C: File OK: CR

Print Statement:

BASE C: Print C: Statement at A: ADDRESS CR V: CR

Print the rest of the file:

BASE C: Print C: Rest OK: CR

(2) Easy Print:

BASE C: \ [backslash prints the statement where you are]

4. EDITING

To change information that has been typed in:

To change information within a statement:

Substitute Text in Statement [to correct most errors]:

BASE C: Substitute C: Text (in) C: Statement (at) A: ADDRESS CR
(New TEXT) T: TYPEIN CR
(Old TEXT) T: TYPEIN CR Finished? S/Y/N: Y [for yes]
Substitutions made: NUMBER

[replaces the old text with the new text every time it occurs in the statement.]

To change whole statements:

Delete Statement

BASE C: Delete C: Statement at A: ADDRESS CR OK: CR

(2) Move Statement:

BASE C: Move C: Statement (from) A: ADDRESS CR (to follow) A: ADDRESS CR L: CR

(2) Copy Statement:

BASE C: Copy C: Statement (from) A: ADDRESS CR (to follow) A: ADDRESS CR L: CR

Delete File

BASE C: Delete C: File T: FILENAME CR OK: CR

[Careful, this removes the file. You can Undelete a File anytime before Logout.]

Update: [do periodically for backup, not imperative]

BASE C: Update C: File OK/C: CR
(DIRECTORY, FILENAME.NLS;2,)

(2) formatting technique:

To type in a carriage return within a TYPEIN, type CTRL v CR

5. COMMUNICATING

(2) SENDMAIL SYSTEM: How to Send Journal Mail

(2) Example of submit message using idents [or ,lastname] and interrogate [where the system prompts you]:

BASE C: Goto (subsystem) C: Sendmail OK: CR

SEND C: Interrogate OK: CR

(distribute for action to:) T: CHI,FEEDBACK,SGR CR

(distribute for information-only to:) T: JCN CR

(title:) T: Your Example CR

(type of source:) C: Message T: TyPEIN CR

(show status?) Y/N: Y [the status typed by the system:]

TITLE: Your Example
AUTHOR(S): JHB
DISTRIBUTE FOR ACTION TO: chi feedback sgr
DISTRIBUTE FOR INFO-ONLY TO: jcn
MESSAGE: [Typein of message will be repeated.]

(send the mail now?) Y/N: Y [for yes]

Completed

SEND C: Quit OK:/C: CR

(2) to send a statement that's already stored online, use the following instead of Message [See the Command Summary for example]

SEND C: Statement A: ADDRESS CR

(2) to send a file use the following instead of Message [See the Command Summary for example]

SEND C: File A: FILENAME, CR

(2) How to Read Journal Mail You've Received

(2) The mail box is in your initials file under a statement called "(Journal)"

(2) Print Journal

BASE C: Print C: Journal (mail) OK: CR

(2) Empty mail box: substitute (read) for (journal). [Note: This is a temporary method for the present course level]

TENEX ways of communicating: SNDMSG and LINK

To send a Message in Tenex

BASE C: Goto (subsystem) C: Tenex OK: CR
[You cannot log out from this Tenex, must QUIT]:

SNDMSG CR [The system will prompt you:]
(To (? for help):) TYPEIN CR [lastnames separated by comma]
(cc (? for help):) TYPEIN CR [lastnames separated by comma]
(Subject:) TYPEIN CR [subject of your message]
(Message ? for help): TYPEIN
CRTL Z CR [to terminate and send the message]

QUIT CR [To go back to where you were in TNLS]

To read a Message in Tenex

MESS CR

Linking (in Tenex) [first ask where the person is:]

BASE C: Quit OK/C: Nls OK: CR
WHERE <SP> USERNAME CR [do not link when user is in SNDMSG, OUTPRC, NOUTPRC, or XLIST]

LINK <SP> USERNAME CR [precede comment with ; end with CR repeat every 3 lines]
BYE CR [to break the link]
CON CR [returns you to NLS]

6. ADDRESSING

Where the control marker is -- type a /
[see the questionmark key on some terminals]. This will show an arrow pointing to the character that you are at: ==>x

Addressing within files [to move the control marker]

Jump to new address [to change where your control marker is]

BASE C: Jump (to) C: Address A: ADDRESS CR

OR you can type in an address anytime you see the prompt A: An address can be:

statement number [NOTE: TNLS automatically renumbers statements when appropriate]

(2) 1 ,t ("tail") for the last statement in the file -- begins looking from statement number 1. Use this address to add statements to the end of your file. [the one is necessary to avoid confusion]

(2) "TYPEIN" To find some word or text

BASE C: Jump (to) C: Address A: "TYPEIN" CR

[enclose in quotes whatever word or series of characters you want to find -- takes you to the first occurrence of it that occurs to the right and down in your file]

(2) statement number and "TYPEIN" To find some word or TYPEIN starting in a particular statement

BASE C: Jump (to) C: Address A: STATEMENT NUMBER "TYPEIN" CR

Addressing across files and directories

To address another file:

BASE C: Jump (to) C: Address A: FILENAME,CR

To address another person's file:

BASE C: Jump (to) C: Address A: DIRECTORY,FILENAME, CR

To address a particular statement in another person's file:

BASE C: Jump (to) C: Address A: DIRECTORY,FILENAME,STATEMENT NUMBER CR

7. TROUBLE SHOOTING AND HELP

Immediate assistance from the system:

Type ? for a list of all the possible command words.

Type CTRL G for help concerning what you are doing or type H for the Help command [after Help you can type any NLS word you wish to know about]. CTRL x gets you out of Help and back to where you were.

(2) Status commands

CTRL t [note words RUNNING or WAIT -- system should be either running or waiting for you]

call SRI-ARC, [415 326-6200, ext.3630]
or Link to Feedback, Bair, Roetter, or Beck at Office-1

(2) FEEDBACK mechanism: [any complaints, questions, problems, suggestions]

SNDMSG or sendmail to FEEDBACK
response should be no later than 1 working day.

(2) Remedies

CTRL C, RESET, NLS [use only in emergencies to get to Tenex]

BASE C: Update C: File OK/C: Compact OK: CR [re-stores file more efficiently in computer]

If your connection is broken:

Repeat Step 2 of the Net login procedure on page 4
To check if you are detached, use the where command:
WHERE <SP> USERNAME CR
If you are detached, instead of logging in, type:
ATT <SP> USERNAME <SP> PASSWORD <SP> CR
CTRL X [to wake up NLS if that's where you were, or:]
CTRL C NLS CR [to start over again]

PRACTICE

In addition to trying each command, there is a Primer designed to be used for practice.

If your connection is broken:

Repeat Step 2 of the Net login procedure on page 4
To check if you are detached, use the where command:
WHERE <SP> USERNAME CR
If you are detached, instead of logging in, type:
ATT <SP> USERNAME <SP> PASSWORD <SP> CR
CTRL X [to wake up NLS if that's where you were, or:]
CTRL C NLS CR [to start over again]

TNLS COMMAND SUMMARY FOR THIS COURSE: [alphabetical] You type that part of the command that appears in capitals. CR = Carriage Return.

BACKSPACE CHARACTER = CTRL a ; BACKSPACE WORD = CTRL w

CARRIAGE RETURN [formatting] = CTRL v CR

CONTINUE TO INSERT = CTRL e instead of first CR [CTRL x to stop inserting]

COPY STATEMENT:

Copy C: Statement (from) A: ADDRESS CR (to follow) A: ADDRESS CR L: CR

CREATE FILE:

<SP>CReate C: File T: FILENAME CR

DELETE STATEMENT:

Delete C: Statement (at) A: ADDRESS CR OK: CR

DELETE FILE:

Delete C: File I: FILENAME CR OK: CR

GOTO TENEX:

Goto (subsystem) C: Tenex OK: CR

HELP:

Help OK/T: CR

INSERT STATEMENT:

Insert C: Statement (to follow) A: ADDRESS T: TYPEIN CR

INSERT TEXT at the end of a statement

Insert C: Text to follow A: +e CR T: TYPEIN CR

JUMP TO ADDRESS:

Jump (to) C: Address A: ADDRESS CR

Jump (to) C: Address A: "TYPEIN" CR

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   Jump (to) C: Address A: statement number "TYPEIN" CR

   Jump (to) C: Address A: FILENAME, CR

   Jump (to) C: Address A: DIRECTORY,FILENAME, CR

   Jump (to) C: Address A: DIRECTORY,FILENAME,STATEMENT NUMBER CR

LOAD FILE:

   Load C: File T: FILENAME CR

LOGOUT:

   <SP>Logout OK: CR

MOVE STATEMENT:

   Move C: Statement (from) A: ADDRESS CR (to follow) A: ADDRESS
   CR L: CR

PRINT FILE:

   Print C: File OK: CR

PRINT JOURNAL:

   Print C: Journal (mail) OK: CR

PRINT REST:

   Print C: Rest OK: CR

   Stop printing = CTRL o

PRINT STATEMENT:

   Print C: Statement at A: ADDRESS CR V: CR

   Easy print = \

QUIT:

   Quit OK/C: Nls OK: CR

SHOW DIRECTORY:

   <SP>SHow C: Directory (of) OK/T: CR OK: CR OK:
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SUBSTITUTE TEXT IN STATEMENT:

Substitute C: Text in C: Statement at A: ADDRESS CR
(New TEXT) T: TYPEIN CR
(Old TEXT) T: TYPEIN CR Finished? S/Y/N: ANSWER
Substitutions made: NUMBER

TAIL = 1 .t for ADDRESS

[the last statement in the file -- when single level]

UPDATE A FILE:

Update C: File OK/C: CR

SENDMAIL SYSTEM:

Submit Message or Statement or File, idents [or ,lastname], and Interrogate:

BASE C: Goto (subsystem) C: Sendmail OK: CR

SEND C: Interrogate OK: CR

(distribute for action to:) T: CHI,FEED,JCN CR

(distribute for information-only to:) T: RWW CR

(title:) T: Your Example CR

(type of source:) C: Message T: TyPEIN CR

OR..type of source:) C: Statement A: ADDRESS CR

OR..type of source:) C: File A: FILENAME, CR

(show status?) Y/N: Y

TITLE: Example

AUTHOR(S): JHB

DISTRIBUTE FOR ACTION TO: chi feed jcn

DISTRIBUTE FOR INFO-ONLY TO: rww

MESSAGE: TYPEIN of message.

(Send the mail now?) Y/N: Y

Completed

Quit OK/C: CR

BASIC TNLS-8 COURSE OUTLINE

(J32609) 3-JUN-75 22:27;;;; Title: Author(s): James H. Bair/JHB; Distribution: /US([ACTION]) KWAC([INFO-ONLY]) SRI-ARC([INFO-ONLY]) EJK([INFO-ONLY]) ; Sub-Collections: SRI-ARC US KWAC; Updates Document(s): 25478; Clerk: JHB; Origin: < BAIR, BASICCOURSE.NLS;13, >, 3-JUN-75 21:55 JHB ;;;;####;

DCE 28-MAY-75 08:56 32611

Problem jumping to Journalized message

Susan sent a Journal message ann{uncing a training course for ARC -- 32606,>. I wanted to see the distribution list, so I (several times) tried DNLS Jump Link, and TNLS Print Branch journal,32606, . Kept getting "File Not On-line: If Archi....", no "catalog" searching. Time, about 0845 at OFFICE-1. 1

DCE 28-MAY-75 08:56 32611

Problem jumping to Journalized message

(J32611) 28-MAY-75 08:56;;;; Title: Author(s): Douglas C. Engelbart/DCE; Distribution: /JDH([ACTION]) FEED([INFO-ONLY]) SGR([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: DCE;

FGB 28-MAY-75 19:33 32613

Ident Info for Gil Myers

Greg, 1

I need Gil Myers' middle initial to request an ident. If any of the info below is wrong, please supply corrected info. I also need the names of current mini subgroup together with similar information before I can fix up NAVMINI directory. 1a

I'll try to call Gil in next day or so. 1b

Ident Information: 1c

Gilbert Myers 1c1

Naval Electronics Laboratory Center 1c2

San Diego, Ca. 92152 1c3

Tel.: 714 225-7044 or Autovon 933-7044 1c4

Directory: NAVMINI 1c5

Regards, 2

Frank. 3

FGB 28-MAY-75 19:33 32613

Ident Info for Gil Myers

(J32613) 28-MAY-75 19:33;;;; Title: Author(s): Frank G. Brignoli/FGB; Distribution: /JGN([ACTION]) ; Sub-Collections: NIC; Clerk: FGB;

FGB 28-MAY-75 19:39 32614

ELF Documentaion

I have just received some new ELF documentation from Dave Retz. I am having it reproduced and will distribute when available (7-10 days approx.). Regards, Frank 1

ELF Documentaion

(J32614) 28-MAY-75 19:39;;;; Title: Author(s): Frank G. Brignoli/FGB; Distribution: /NAVIMP([ACTION]) JCM3([ACTION]) ; Sub-Collections: NIC NAVIMP; Clerk: FGB;

JMB 29-MAY-75 07:08 32615

Suggested format for Weekly Reports

The actual info would be inserted one level down from each time period.

JMB 29-MAY-75 07:08 32615

Suggested format for Weekly Reports

USER SERVICES WEEKLY REPORT from JMB: 19 MAY - 23 MAY 1

MON 19 MAY	Time: All day 9259-5	==> at ARPA	1a
TUES 20 MAY	Time: 4 hrs 3074	==> at ARPA	1b
	Time: 4 hrs 9259-5	==> at ARPA	1c
WED 21 MAY	Time: All day 9259-5	==> at ARPA	1d
THUR 22 MAY	Time: 4 hrs 3074	==> at SRI-WASH	1e
	Time: 4 hrs 9259-5	==> at ARPA	1f
FRI 23 MAY	Time: 4 hrs 9259-7	==> at Pentagon	1g
	Time: 4 hrs 9259-5	==> at ARPA	1h

Note: Pamela Allen observed all my work for 3 days Wed-Fri. I was impressed with her questions, suggestions, manner with clients, and how much she had learned in the time she's worked with us. It's too bad that the Rosslyn environment was so awful (extreme heat, humidity, & smog, and the normal high level of noise) while she was here. 1i

JMB 29-MAY-75 07:08 32615

Suggested format for Weekly Reports

(J32615) 29-MAY-75 07:08;;;; Title: Author(s): Jeanne M. Beck/JMB; Distribution: /SGR([ACTION]) US([ACTION]) ; Sub-Collections: SRI-ARC US; Clerk: JMB;

NLS Financial Management System (FMS)

THINGS YOU DON'T ALWAYS GET TO SEE IN CONFESSIONS

which is indicative of the way it has been going on this effort.

JPC 29-MAY-75 07:26 32616

NLS Financial Management System (FMS)

In January I visited SRI to determine the feasibility of using NLS and L10 to handle financial data for the IS division. SRI felt their system was suitable and seemed intrigrued with our problem and promised training for us in L10 and programming support. 1

Since then, we have tried to follow a structured approach to the effort. An experimental database was put together and maintained for a while in an attempt to understand the procurement process and to clarify its impact on the division in terms of data items needed. After a number of iterations, a full-fledged database design emerged. A database collection document has been written and off-line data collection has been tasked to Ed LaForge. A top-down design for the overall system has been worked out and should be available for review within the next week or two. 2

I have taken a hard look at L10 and although I have been able to write some Content Analyzer programs, the more sophisticated, executable L10 programs are too difficult to pick up from the inadequate documentation we have on L10. Before we will be able to apply ourselves successfully to this effort, we need first hand assistance in learning executable L10. 3

My earlier estimates for this point in time had been for us to have completed L10 training and be ready to begin coding on the system which would have been operational late this summer. Two complementary actions have caused this effort to slip. First, SRI has been unable to support us due to their NSW commitments. However, by mid-June, they should be able to give us some of the help we need.

The corrollary to this is that the two people working on this in-house project, Frank LaMonica and myself, have been assigned other tasks which have interfered with our work on this effort (for the whole month of May, both of us together have been unable to put a week's work against this job). Assuming our design is approved and we are able to obtain L10 training shortly afterward, the system might be ready by late fall. 4

NLS Financial Management System (FMS)

(J32616) 29-MAY-75 07:26;;;; Title: Author(s): Joe P. Cavano/JPC;
Distribution: /RDK([ACTION]) DLS([INFO-ONLY]) JLM([INFO-ONLY]
) FJT([INFO-ONLY]) RFI([INFO-ONLY]) DFB([INFO-ONLY]) JCN([
INFO-ONLY]) FSL([INFO-ONLY]) ELF([INFO-ONLY]) ;
Sub-Collections: RADC; Clerk: JPC; Origin: < CAVANO,
FMS/STATUS.NLS;1, >, 29-MAY-75 07:00 JPC ;;;;####;

DCE 29-MAY-75 08:47 32617

To JDH re Journal-target link hops accessing partial-copy info

Dave: In (HJOURNAL, 25944,) you explain why I couldn't do a Jump Link to the source of a recent message (I wanted to look at the distribution) -- the catalogs hadn't been updated yet. Makes me wonder how hard it would be to let the Jump Link machinery, when it knows that it is looking into Journal material where there can't be any writing, go ahead and have open access to the partial copy? Logically it seems sound to me. Would it be difficult to implement? 1

DCE 29-MAY-75 08:47 32617

To JDH re journal-target link hops accessing partial-copy info

(J32617) 29-MAY-75 08:47;;;; Title: Author(s): Douglas C. Engelbart/DCE; Distribution: /JDH([ACTION]) FEED([INFO-ONLY]) CHI([INFO-ONLY]) JCN([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: DCE;

JCN 29-MAY-75 09:54 32618

Some Answers to Your Questions

for record purposes

Some Answers to Your Questions

Here are some answers to the questions you asked recently...and that we discussed yesterday. 1

1. NLS and the frontend mini 1a

The ARC Development group is currently working on the next version of NLS under the ARPA/AF National Software Works program. This involves, besides other things, a split of the code supporting NLS into a frontend (to run at first on a PDP-11) and a backend (to run at first on the PDP-10 TENEX). 1a1

We plan to bring up the new "NSW_NLS" at USC-ISI experimentally for ARC Development use this summer. Assuming that happens and after several months of test use occurs, we plan to make whatever changes are necessary to that version in order to bring up NLS-9 at Office-1 and wherever else we offer Workshop Utility service. That version will be VERY much like NLS-8. We may be bringing that version up about January 1976, but that depends on a lot. We won't have the big job we had during the conversion from NLS-7 to NLS-8 for the same command scheme as is in NLS-8 will be continued. For organizations that are planning to buy enough service to support several terminals, direct purchase of a PDP-11 should be investigated. We do not know yet just what model, and configuration we will reccommend. Our own use will help us understand that better. For those user organizations that cannot afford an 11, we plan to make one available at the host site (Tymshare, BBN...?) therefore making the split more or less invisible to users. 1a2

It seems to me that it's too early to advise Utility users on just the PDP-11 configuration they should acquire (now) to run an NLS front-end 8 months from now, since we ourselves dont know how many terminals the system we're putting together will support, or if the whole arrangement will prove to be what we hope it will. If you wish, I can get you the specs on the 11 we have, but would sure hate to mislead you in your selection. It may well be that a far cheaper 11, perhaps better designed will be available when you need one..we hear there may be a VERY inexpensive one available that may do the trick. Martin Hardy is in the East and I'm trying to get more info from him. 1a3

2. Continued to the ARPANET 1b

Good to hear that you will have ARPANET access for a year or so. We don't have any information leading us to think that the Rutgers-tip will go away. Seems to me that it's more likely that more tips in your area will be the case ..not less. It's hard to get an idea of the ARPA/DCA plans now. With the transfer of the NET to DCA (Defense Communications Agency) this

July, those people are faced with so many planning and policy problems, I can't imagine they know yet what additions and/or deletions are coming. We'll keep you informed if we hear anything. 1b1

Your status as an Office-1 user does not give you access to the ARPANET. What I hear from DCA is that after they get their administration going...this Fall... that users of the ARPANET will need some Government agency (any..!) as a sponsor. In addition, there will be some kind of connection charge either for Hosts (like Office-1) or for tips...perhaps special arrangements with users..like ETS...but the whole scheme is just talk now....as it has been for several years. 1b2

3. Service from BBNB 1c

We are planning to acquire about 32% of the user CPU cycles at BBNB for further expansion of the Utility service...call it the start of Office-2. This will start in July, if we can act fast enough. Seems to me that your "slot(s)" might be well-served from Boston, then. We can talk more about that. It does seem to be a more economical place to go for service if you lost your ARPANET access, though in a year or so, the NLS-9 configuration will have a bearing on what is the best way to connect. Perhaps there will be a Tymshare-run Office-3 in Philly, for that's their Eastern center.. just don't know. Tymshare account you may get won't make any difference to Utility service, i suspect, unless it is easier transfer of data between systems.. like off tape. We have no specific plans to connect the Tymnet, but may as the needs arise. There are also some legal questions about interconnection of Nets unresolved. 1c1

4. Terminals 1d

You should get Martin Hardy on the phone and discuss terminals, tape units directly....though he's away until late next week..or early the following. 1d1

5. Printer at ETS and the PDP-11 1e

Again, you need Martin Hardy for info on connecting your printer for use with Office-1. It may be that the printer connection capability of the Line processor would do it, but I just don't know. Think telephone talk with MEH would give you what you need. 1e1

We plan to keep the same charging arrangement in effect until January 1976. At that time, we hope to have a system developed that treats the charging for CPU, disk space, indirect and direct

assistance to users more appropriately. The current system has been in operation for over a year. We charge all computer service costs (Tymshare subcontract) and "indirect" ARC services (keeping NLS running, Journal, identfile, feedback, training course improvements, documentation) to a common account from which we charge on a 1/25 per slot basis. All direct training, technical assistance, travel related to that..is charged directly to client contracts. Such direct assistance should come to approximately 4 hours per week per slot on the average through the year. We are still learning about what is needed to do the job. We do not charge the Utility clients for our research, though we are going to include some minor system additions costs in the common account after July..for things most users seem to want at about a half-person level until January. Dick Watson now has the person and is getting him ready to help us. 1f

With one slot comes up to 15 user directories and a total of 3000 disk pages...200 per directory average. We do not price these items or the training, assistance separatly yet. But do charge the direct people-service directly as I mentioned above. 1g

Youre aware of the coming switch to TENEX 1.33 and allocation of CPU cycles (3% per slot?) and the prospect of supporting more than one job within a slot. We plan to bring it up tomorrow. We need experience with it befoe we can say what you should get in the way of cycles under this new arrangement. Certainly by next January, we will know, and will reflect what we learn in our pricing structure. 1h

Some Answers to Your Questions

(J32618) 29-MAY-75 09:54;;;; Title: Author(s): James C. Norton/JCN;
Distribution: /DAP([INFO-ONLY]) ; Sub-Collections: NIC; Clerk: JCN;
Origin: < NORTON, DAVEPP.NLS;1, >, 29-MAY-75 09:07 JCN ;;;;####;

this is a demo of the journal syste

Background 1

Technological Forecasting 1a

early BPG Delphi studies determined what will be AVAILABLE 1a1

Some quotes from internal and external Business Delphi studies on communications technolgoy in the home, with particular reference to Household information and dedicated news: 1a2

"This requires the development of data communications facilities vastly superior to those available today. The necessary technologies - digital transmission and packet switching - are available but have not yet been exploited to yield the necessary improved reliability and cost reductions." 1a2a

"The conservative nature of Canadians,plus the relatively sparse poplulation will make this advancement economically unfeasible in the near future. This requires the mass development of easy access mini computers with large capacity and links to large computers". 1a2b

"There is a certain 'with it' group composed of many kinds of technically sophisticated people who will provide the initial 20% thrust quite rapidly. Also, they have the income. Achieving the 55% figure will take a good deal longer." 1a2c

"This requires a very unified and systematic approach to the redesign of many of these activities - the technology will be of secondary importance. The primary developments will be in the changing of our attitudes towareds these 'institutions' and justifying that changes in these areas are valuable and worthwhile. These will not happen merely because we thave the hardware to do it." 1a2d

" I do not feel that these types of applicatons will convince the consumers to part with a significant expenditure of his resorces. All of the above type applicatons have very cheap alternatives which will make this a tough market to crack. Future technology in the home wll depend upon applications development, not technological concerns." 1a2e

"On-line data files and economical terminals will provide the means. Urban congestion and transportation failures will produce the need." 1a2f

Further comments from the Business Delphi, with reference to remote work centers: 1a3

"If the movement to the suburbs continues, geographic dispersal of employees is liable to become so great that the neighborhood concept will be bypassed in favor of [home work centers]. The short term trend of office movement to suburbs, then personnel relocating close-by, extends the preactical life of the office center concept." 1a3a

"There will always be high capital cost equipment which can only be located in a work center and shared by many people. At the present time we cannot forecast what this equipment wil be, but if we learn anything from history, it is that such equipment will be sufficiently desirable that most people will prefer some variation on the centralized work area concept. I am not ruling out increase mibility (eg. ortable computer terminals) but I am saying the worker will have a home base and it will be an office work center." 1a3b

Market Demand Analysis 1b

MTB thesis, plus info from external sources indicated what would be desired, accepted by the market 1b1

ENTERTAINMENT 1b2

Thesis contribution: 1b2a

rated "very important" to "moderately important" by over 75% of respondents in first study 1b2a1

the comments were both PRO (the researchers) and CON (housewives), with the housewives asking questions 1b2a2

over 50% saw is as a large improvement over current alternatives 1b2a3

EDUCATION 1b3

Thesis contribution: 1b3a

over 50% saw it as extremely useful for ages 14-18, 18-25. 1b3a1

about 75% saw it as "very" to "moderately" important 1b3a2

about 90% saw it as a major improvement to current alternatives 1b3a3

this is a demo of the journal syste

HOUSEHOLD INFORMATION AND DEDICATED NEWS 1b4

Thesis contribution: 1b4a

over 60% said it was "moderately" to "very" important; 1b4a1

over 60% said it was a "moderate" to "large" improvement. 1b4a2

SHOPPING 1b5

Thesis contribution: 1b5a

general acceptance by householders for just abot all kinds of purchases. 1b5a1

BANKING 1b6

Thesis contribution: 1b6a

over 75% said, yes, it would be used if available 1b6a1

cost to the user would be about the same as alternative status quo 1b6a2

most useful documentation in form of hard-copy statemnts, bills; 1b6a3

reference in Business Delphi study of availability on weekends, etc. (good reference, use it !) 1b6a4

WORK CENTER 1b7

The internal and external Business Delphi studies looked at this question and saw neighborhood work centers evolving by 1986-1990; home work centers by 1991-2000: 1b7a

"Entrepreneurs will strive to get their money out of existing downtown skyscrapers. We in Canada will not have reached the point where alternatives to present day arrangements are unsatisfactory - ie, road congestion, transportation difficulties, etc." 1b7a1

Dan Goodwill's summation....."A 'lack of desire for travel', the 'greater economy in substituting communications for travel', and the inability of our transportation system to cope with the population increase are expected to encourage us to more in this direction." 1b7a2

this is a demo of the journal syste

"The neighborhood remote work center offers a means of managerial control. Conceptually it is little different from the branch bank or store. It will have to come ase large urban areas become absolutely choked by Transportation." 1b7a3

"The professional working man requires the intellectual stimulation of interacting with other professionals in a 'work environment'. As a result, single person work centers, despite their initial appeal, will not be successful. They would be too intellectually lonely." 1b7a4

"Who can work with the kids around." 1b7a5

MEDICAL DIAGNOSIS 1b8

Thesis contribution: 1b8a

POLITICAL PARTICPATION 1b9

Thesis contribution: 1b9a

HOME SURVEILLANCE 1b10

Thesis contribution: 1b10a

Technology Assessment required to determine the impacts the services would have if introduced on a widespread basis. 1c

MIKE 29-MAY-75 11:54 32619

this is a demo of the journal syste

(J32619) 29-MAY-75 11:54;;;; Title: Author(s): Michael T. Bedford/MIKE; Distribution: /LHD([ACTION]) IMM([INFO-ONLY]) ; Sub-Collections: NIC; Clerk: MIKE;

ETS Memo Formatting Program

Updated ETSMEMC program... compile both (cml and subsys) code files (using Compile File command in PROGRAMS subsystem) before use.

```
FILE cetsmemo % (CML.SAV,) TO (etsmemo.cml,) %                          1
  % DECLARATIONS %                                                      1a
    DECLARE PARSEFUNCTION                                               1a1
      answ,          % reads answer construct %                        1a1a
      answer,        % for questions - returns  0/1 %                  1a1b
      sp,            % reads next char, TRUE if space %                1a1c
      readconfirm,   % reads next char if ca %                         1a1d
      readbug,       % reads next char if BUG %                        1a1e
      readoption,    % TRUE if next char is optchar %                  1a1f
      readrepeat,    % TRUE if next char is repeat %                   1a1g
      lookansw,      % TRUE if next char is Y/CA %                     1a1h
      lookconfirm,   % TRUE if next char is CA/REPEAT/INSERT %         1a1i
      lookbug,       % TRUE if next char is BUG %                      1a1j
      looknum,       % TRUE if next char is a number %                 1a1k
      clearname,     % clears the name area %                          1a1l
      notca;         % reads next char, TRUE if not CA char %          1a1m
    DECLARE COMMAND WORD                                                1a2
      "BRANCH" = 1 ,                                                    1a2a
      "GROUP" = 2 ,                                                     1a2b
      "PLEX" = 3 ,                                                      1a2c
      "STATEMENT" = 4 ,                                                 1a2d
      "CHARACTER" = 5 ,                                                 1a2e
      "CONTROLCHAR" = 6 ,                                               1a2f
      "INVISIBLE" = 7 ,                                                 1a2g
      "LINK" = 8 ,                                                      1a2h
```

```
        "DIRECTORY" = 9 ,                                   1a2i
        "PASSWORD" = 10 ,                                   1a2j
        "NUMBER" = 11 ,                                     1a2k
        "TEXT" = 12 ,                                       1a2l
        "VISIBLE" = 13 ,                                    1a2m
        "WORD" = 14 ,                                       1a2n
        "FILE" = 15 ,                                       1a2o
        "NEWFILELINK" = 16 ,                                1a2p
        "OLDFILELINK" = 17 ,                                1a2q
        "NAME" = 18 ,                                       1a2r
        "IDENT" = 19 ,                                      1a2s
        "IDENTLIST" = 20 ,                                  1a2t
        "EDGE" = 21 ,                                       1a2u
        "MARKER" = 22 ,                                     1a2v
        "NLS" = 23 ,                                        1a2w
        "ITEM" = 24 ,                                       1a2x
        "ITEMNOVS" = 25 ,                                   1a2y
        "SUCCESSOR" = 26 ,                                  1a2z
        "PREDECESSOR" = 27 ,                                1a2a@
        "UP" = 28 ,                                         1a2aa
        "DOWN" = 29 ,                                       1a2ab
        "HEAD" = 30 ,                                       1a2ac
        "TAIL" = 31 ,                                       1a2ad
        "END" = 32 ,                                        1a2ae
        "BACK" = 33 ,                                       1a2af
```

```
"NEXI" = 34 ,                                                   1a2ag
"ORIGIN" = 35 ,                                                 1a2ah
"FILERETURN" = 36 ,                                             1a2ai
"RETURN" = 37 ,                                                 1a2aj
"FILENAME" = 38 ,                                               1a2ak
"FIRSTNAME" = 39 ,                                              1a2al
"NEXTNAME" = 40 ,                                               1a2am
"EXTNAME" = 41 ,                                                1a2an
"FIRSTCONTENT" = 42 ,                                           1a2ao
"NEXTCONTENT" = 43 ,                                            1a2ap
"FIRSTWORD" = 44 ,                                              1a2aq
"NEXTWORD" = 45 ,                                               1a2ar
"DETACHED" = 46 ,                                               1a2as
"TTY" = 47 ,                                                    1a2at
"AUTO" = 48 ,                                                   1a2au
"CONTINUE" = 49 ,                                               1a2av
"ON" = 50 ,                                                     1a2aw
"RECOVER" = 51 ,                                                1a2ax
"SLINKER" = 52 ,                                                1a2ay
"UPDATE" = 53 ,                                                 1a2az
"CLEAR" = 54 ,                                                  1a2b@
"IDENTS" = 55 ,                                                 1a2ba
"FILES" = 56 ,                                                  1a2bb
"DELETE" = 57 ,                                                 1a2bc
"DEFERRED" = 58 ,                                               1a2bd
```

```
        "IMMEDIATE" = 59 ,                                      1a2be
        "NOT" = 60 ,                                            1a2bf
        "PREVENT" = 61 ,                                        1a2bg
        "RESET" = 62 ,                                          1a2bh
        "ARCHIVE" = 63 ,                                        1a2bi
        "SEQUENTIAL" = 64 ,                                     1a2bj
        "TWO" = 65 ,                                            1a2bk
        "JUSTIFIED" = 66 ,                                      1a2bl
        "ASSEMBLER" = 67 ,                                      1a2bm
        "BOTH" = 68 ,                                           1a2bn
        "UNDELETE" = 69 ,                                       1a2bo
        "FOR" = 70 ,                                            1a2bp
        "STATUS" = 71 ,                                         1a2bq
        "TAPE" = 72 ,                                           1a2br
        "ACCOUNT" = 73 ,                                        1a2bs
        "NO" = 74 ,                                             1a2bt
        "VERSIONS" = 75 ,                                       1a2bu
        "EXTENSION" = 76 ,                                      1a2bv
        "DATE" = 77 ,                                           1a2bw
        "CREATION" = 78 ,                                       1a2bx
        "LAST" = 79 ,                                           1a2by
        "FIRST" = 80 ,                                          1a2bz
        "READ" = 81 ,                                           1a2c@
        "WRITE" = 82 ,                                          1a2ca
        "DUMp" = 83 ,                                           1a2cb
```

```
"EVERYTHING" = 84 ,                                    1a2cc
"LENGTH" = 85 ,                                        1a2cd
"MISCELLANEOUS" = 86 ,                                 1a2ce
"ACCESSES" = 87 ,                                      1a2cf
"PROTECT" = 88 ,                                       1a2cg
"SIZE" = 89 ,                                          1a2ch
"TIME" = 90 ,                                          1a2ci
"VERBOSE" = 91 ,                                       1a2cj
"SORT" = 92 ,                                          1a2ck
"BYTESIZE" = 93 ,                                      1a2cl
"ARCHIVED" = 94 ,                                      1a2cm
"ALL" = 95 ,                                           1a2cn
"MODIFICATIONS" = 96 ,                                 1a2co
"UPPER" = 97 ,                                         1a2cp
"LOWER" = 98 ,                                         1a2cq
"MODE" = 99 ,                                          1a2cr
"SENDMAIL" = 100 ,                                     1a2cs
"BUSY" = 101 ,                                         1a2ct
"QUICKPRINT" = 102 ,                                   1a2cu
"JOURNAL" = 103 ,                                      1a2cv
"PRINTER" = 104 ,                                      1a2cw
"COM" = 105 ,                                          1a2cx
"TERMINAL" = 106 ,                                     1a2cy
"REMOTE" = 107 ,                                       1a2cz
"REST" = 108 ,                                         1a2d@
```

```
        "CASE" = 109 ,                                          1a2da
        "CONTENT" = 110 ,                                       1a2db
        "TEMPORARY" = 111 ,                                     1a2dc
        "VIEWSPECS" = 112 ,                                     1a2dd
        "EXTERNAL" = 113 ,                                      1a2de
        "TO" = 114 ,                                            1a2df
        "PRIVATE" = 115 ,                                       1a2dg
        "PUBLIC" = 116 ,                                        1a2dh
        "TENEX" = 117 ,                                         1a2di
        "ALLOW" = 118 ,                                         1a2dj
        "EXECUTE" = 119 ,                                       1a2dk
        "APPEND" = 120 ,                                        1a2dl
        "LIST" = 121 ,                                          1a2dm
        "SET" = 122 ,                                           1a2dn
        "SELF" = 123 ,                                          1a2do
        "FORBID" = 124 ,                                        1a2dp
        "DISK" = 125 ,                                          1a2dq
        "DEFAULT" = 126 ,                                       1a2dr
        "OLD" = 127 ,                                           1a2ds
        "NEW" = 128 ,                                           1a2dt
        "COMPACT" = 129 ,                                       1a2du
        "RENAME" = 130 ,                                        1a2dv
        "ADD" = 131 ,                                           1a2dw
        "SUBTRACT" = 132 ,                                      1a2dx
        "MULTIPLY" = 133 ,                                      1a2dy
```

```
"DIVIDE" = 134 ,                                    1a2dz
"RIGHT" = 135 ,                                     1a2e@
"LEFT" = 136 ,                                      1a2ea
"ACTION" = 137 ,                                    1a2eb
"AUTHORS" = 138 ,                                   1a2ec
"COMMENT" = 139 ,                                   1a2ed
"EXPEDITE" = 140 ,                                  1a2ee
"HARDCOPY" = 141 ,                                  1a2ef
"INFORMATION" = 142 ,                               1a2eg
"INSERT" = 143 ,                                    1a2eh
"KEYWORDS" = 144 ,                                  1a2ei
"OBSOLETES" = 145 ,                                 1a2ej
"RFC" = 146 ,                                       1a2ek
"SUBCOLLECTIONS" = 147 ,                            1a2el
"TITLE" = 148 ,                                     1a2em
"UNRECORDED" = 149 ,                                1a2en
"L10" = 150 ,                                       1a2eo
"PROCEDURE" = 151 ,                                 1a2ep
"SEQGENERATOR" = 152 ,                              1a2eq
"BUFFER" = 153 ,                                    1a2er
"NDDT" = 154 ,                                      1a2es
"PARSERULE" = 155 ,                                 1a2et
"CA" = 156 ,                                        1a2eu
"CD" = 157 ,                                        1a2ev
"RPT" = 158 ,                                       1a2ew
```

```
        "BC" = 159 ,                                    1a2ex
        "BW" = 160 ,                                    1a2ey
        "BS" = 161 ,                                    1a2ez
        "LITESC" = 162 ,                                1a2f@
        "IGNORE" = 163 ,                                1a2fa
        "SC" = 164 ,                                    1a2fb
        "SW" = 165 ,                                    1a2fc
        "TAB" = 166 ,                                   1a2fd
        "IMLAC" = 167 ,                                 1a2fe
        "TI" = 168 ,                                    1a2ff
        "NVT" = 169 ,                                   1a2fg
        "EXECUPORT" = 170 ,                             1a2fh
        "MENU" = 171 ,                                  1a2fi
        "DNLS" = 172 ,                                  1a2fj
        "TNLS" = 173 ,                                  1a2fk
        "COMMAND" = 174 ,                               1a2fl
        "RULE" = 175 ,                                  1a2fm
        "SUBSYSTEM" = 176 ,                             1a2fn
        "DISPLAY" = 177 ,                               1a2fo
        "FROZEN" = 178 ,                                1a2fp
        "HLPCOM" = 179 ,                                1a2fq
        "PROGRAM" = 180 ,                               1a2fr
        "TERSE" = 181 ,                                 1a2fs
        "INDENTING" = 182 ,                             1a2ft
        "UNIVERSAL" = 183 ,                             1a2fu
```

```
"ENTRY" = 184 ,                                    1a2fv
"INCLUDE" = 185 ,                                  1a2fw
"BOTTOM" = 186 ,                                   1a2fx
"PAGE" = 187 ,                                     1a2fy
"OFF" = 188 ,                                      1a2fz
"FULL" = 189 ,                                     1a2g@
"PARTIAL" = 190 ,                                  1a2ga
"ANTICIPATORY" = 191 ,                             1a2gb
"DEMAND" = 192 ,                                   1a2gc
"FIXED" = 193 ,                                    1a2gd
"CONTROL" = 194 ,                                  1a2ge
"CURRENTCONTEXT" = 195 ,                           1a2gf
"FEEDBACK" = 196 ,                                 1a2gg
"HERALD" = 197 ,                                   1a2gh
"PRINTOPTIONS" = 198 ,                             1a2gi
"PROMPT" = 199 ,                                   1a2gj
"RECOGNITION" = 200 ,                              1a2gk
"STARTUP" = 201 ,                                  1a2gl
"LEVELADJUST" = 202 ,                              1a2gm
"REVERSE" = 203 ,                                  1a2gn
"TEST" = 204 ,                                     1a2go
"TASKER" = 205 ,                                   1a2gp
"LINEPROCESSOR" = 206 ,                            1a2gq
"CENTER" = 207 ,                                   1a2gr
"CNTLG" = 208 ,                                    1a2gs
```

```
        "ARC" = 209 ,                                                    1a2gt
        "COPIES" = 210 ,                                                 1a2gu
        "FORMATTED" = 211 ;                                              1a2gv
    % COMMON RULES %                                                     1b
      % ENTITY DEFINITIONS %                                             1b1
        editentity = textent / structure;                                1b1a
      % TEXT ENTITY DEFINITIONS %                                        1b2
        textent = text1 / "TEXT" / "LINK";                               1b2a
        text1 = "CHARACTER" / "WORD" / "VISIBLE" / "INVISIBLE" /
        "NUMBER";                                                        1b2b
      % STRUCTURE ENTITY DEFINITIONS %                                  1b3
        structure = "STATEMENT" / notstatement;                          1b3a
        notstatement = "GROUP" / "BRANCH" / "PLEX" ;                     1b3b
    SUBSYSTEM etsmemo KEYWORD "EISMEMO"                                  1c
      COMMAND  linsform =  "INSERT" "FORMAT" <"in file at">              1c1
        dest _ DSEL(#"STATEMENT")                                        1c1a
        CLEAR <"Sender's ident; type <OPTION> character for login
        ident">                                                          1c1b
          ( readoption()  sent _ logid() / sent _ LSEL(#"IDENT") )       1c1b1
          cksid(sent)                                                    1c1b2
        CLEAR <"Memorandum for <separated by carriage returns>:">
        param _ LSEL(#"TEXT")                                            1c1c
        CLEAR <"cc <separated by carriage returns>:"> param2 _
        LSEL(#"TEXT")                                                    1c1d
        CLEAR <"Subject:"> param3 _ LSEL(#"TEXT")                        1c1e
        CONFIRM                                                          1c1f
        xmemo(dest,param,param2,param3) ;                                1c1g
```

```
    END.                                                          1c2
  FINISH                                                          1d
FILE letsmemo % (L10,) <meyer,etsmemo,subsys,> %                  2
  DECLARE STRING sid[20], sfname[200] ;                           2a
  (logid) PROCEDURE % put login ident in record %                 2b
    %FORMALS%                                                     2b1
      (result,      %result record%                               2b1a
      parsemode);   %parsing, backup, cleanup%                    2b1b
    REF result;                                                   2b2
    LOCAL TEXT POINTER lptr1, lptr2 ;                             2b3
    CASE parsemode OF                                             2b4
      = parsing:                                                  2b4a
        BEGIN                                                     2b4a1
        FIND SF(*initsr*) ^lptr1 SE(lptr1) ^lptr2 > ;             2b4a2
        result    _ lptr1;   result[1] _ lptr1[1];                2b4a3
        result[2] _ lptr2;   result[3] _ lptr2[1];                2b4a4
        END;                                                      2b4a5
      ENDCASE;                                                    2b4b
    RETURN(&result);                                              2b5
    END.                                                          2b6
  (cksid) % check sender ident %                                  2c
    PROCEDURE                                                     2c1
      %FORMALS%                                                   2c1a
        (result,  %result record%                                 2c1a1
        parsemode, %parsing, backup, cleanup%                     2c1a2
```

```
        ident); %ident%                                          2c1a3
      REF result, ident;                                         2c1b
      LOCAL TEXT POINTER cptr1, cptr2 ;                          2c1c
      LOCAL STRING idstring[100], idinfor[2000] ;                2c1d
    CASE parsemode OF                                            2c2
      = parsing:                                                 2c2a
        BEGIN                                                    2c2a1
        dismes (1,$"Checking ident...") ;                        2c2a2
        cptr1 _    ident;   cptr1[1] _ ident[1];                 2c2a3
        cptr2 _ ident[2];   cptr2[1] _ ident[3];                 2c2a4
        *idstring* _ cptr1 cptr2 ;                               2c2a5
        astruc (sidstring) ;                                     2c2a6
        *sid* _ *idstring* ;                                     2c2a7
        IF NOT ckident(sidstring, sidinfor, 0) THEN              2c2a8
          BEGIN                                                  2c2a8a
          dismes(1,s"Invalid ident -- retype");                  2c2a8b
          RETURN(FALSE);                                         2c2a8c
          END;                                                   2c2a8d
        getifnf(sidinfor, ssfname);                              2c2a9
        dismes (0) ;                                             2c2a10
        END;                                                     2c2a11
      ENDCASE;                                                   2c2b
    RETURN(&result);                                             2c3
    END.                                                         2c4
```

```
(xmemo) % format memo file %                                        2d
  PROCEDURE                                                         2d1
    %FORMALS%                                                       2d1a
      (result,   %result record%                                    2d1a1
      parsemode, %parsing, backup, cleanup%                         2d1a2
      fileptr,   %pointer to file to be formatted%                  2d1a3
      reclist,   %Receivers%                                        2d1a4
      cclist,    %cc%                                               2d1a5
      tit);      %Title%                                            2d1a6
    REF result, fileptr, reclist, cclist, tit;                      2d1b
    LOCAL TEXT POINTER sf, ptr1, ptr2, ptr3, ptr4;                  2d1c
    LOCAL STRING ccstr[400], titstr[1000], tempstr[1000] ;          2d1d
  CASE parsemode OF                                                 2d2
    = parsing:                                                      2d2a
      BEGIN                                                         2d2a1
      %set up for recreate display%                                 2d2a2
        dpset (dspallf, endfil, endfil, endfil) ;                   2d2a2a
      %put directives in origin%                                    2d2a3
        sf _ fileptr ;                                              2d2a3a
        sf.stpsid _ origin;                                         2d2a3b
        FIND SF(sf) [" ;;;;"/ENDCHR] ^sf;                          2d2a3c
            SI sf sf _ "      ", "      " ;                             2d2a
```

```
%add to first statement %                                              2d2
   IF (sf := getsub(sf))=sf THEN RETURN(&result);                      2d2a
   sf[1] _ 1;                                                          2d2a
   %receivers%                                                         2d2a
      ptr1 _    reclist;   ptr1[1] _ reclist[1];                       2d2a4
      ptr2 _ reclist[2];   ptr2[1] _ reclist[3];                       2d2a4
   %cc%                                                                2d2a
      ptr3 _    cclist;   ptr3[1] _ cclist[1];                         2d2a4
      ptr4 _ cclist[2];   ptr4[1] _ cclist[3];                         2d2a4
      *ccstr* _ ptr3 ptr4 ;                                            2d2a4
      IF ccstr.L THEN *ccstr* _ "
      ", EOL, "                          cc:  ", *ccstr*,
      "" ;                                                             2d2a4
   %title%                                                             2d2a
      ptr3 _    tit;   ptr3[1] _ tit[1];                               2d2a4
      ptr4 _ tit[2];   ptr4[1] _ tit[3];                               2d2a4
      *titstr* _ ptr3 ptr4 ;                                           2d2a4
      IF titstr.L THEN *titstr* _ "Subject:  ",
      *titstr* ELSE *titstr* _ SP ;                                    2d2a4
   %title, date, author%                                               2d2a
      FIND SF(*titstr*) $37(CH) (NP/ENDCHR/< [NP]/TRUE)
      < $NP ^ptr3 > $NP ^ptr4;                                         2d2a4
      *tempstr* _ "
      ", SF(ptr3) ptr3, "  Date:  29 MAY 75", EOL ;                    2d2a4
      ST ptr4 _ ptr4 SE(ptr4) ;                                        2d2a4
      IF FIND SF(*titstr*) 1$27(CH) (NP/ENDCHR/<
      [NP]/TRUE) < $NP ^ptr3 > $NP ^ptr4 THEN                          2d2a4
```

```
        BEGIN                                                    2d2a4f
        *tempstr* _ *tempstr*, SF(ptr3) ptr3 ;                   2d2a4f
        ST ptr4 _ ptr4 SE(ptr4) ;                                2d2a4f
        END;                                                     2d2a4f
      *tempstr* _ *tempstr*, "From:  ", *sfname*, "",
      EOL  ;                                                     2d2a4
      LOOP IF FIND SF(*titstr*) 1$27(CH) (NP/ENDCHR/<
      [NP]/TRUE) < $NP ^ptr3 > $NP ^ptr4                         2d2a4
        THEN                                                     2d2a4f
          BEGIN                                                  2d2a4f6
          *tempstr* _ *tempstr*, SF(ptr3) ptr3, EOL ;
                                                                 2d2a4f6
          ST ptr4 _ ptr4 SE(ptr4) ;                              2d2a4f6
          IF titstr.L < 25 THEN                                  2d2a4f6
            BEGIN                                                2d2a4f6a
            *tempstr* _ *tempstr*, *titstr* ;                    2d2a4f6a
            EXIT LOOP ;                                          2d2a4f6a
            END ;                                                2d2a4f6a
          END                                                    2d2a4f6
        ELSE EXIT LOOP ;                                         2d2a4f
    ST sf sf _ "          Memorandum for:  ", +ptr1
    ptr2, "", *ccstr*, EOL, *tempstr*, "", EOL ;                 2d2a
  % put directives in last statement %                           2d2
```

```
            IF ( sf := getend(ptr3_getail(sf)) ) # sf THEN ST sf
            sf _ "" ;                                                  2d2a

          % insert clerk statement if necessary %                      2d2

            IF *initsr* # *sid* THEN                                   2d2a

              BEGIN                                                    2d2a6

              *tempstr* _ "

              ", *sid*, '/, -SF(*initsr*) SE(*initsr*) ;

              FIND SF(*tempstr*) ^ptr1 SE(*tempstr*) ^ptr2 > ;

              cinssta (ptr3, 0, $ptr1, $ptr2);

              END;

          END;

      ENDCASE;

   RETURN(&result);

   END.

FINISH
```

ETS Memo Formatting Program

(J32621) 29-MAY-75 12:25;;;; Title: Author(s): N. Dean Meyer/NDM;
Distribution: /DAP([ACTION]) FEED([INFO-ONLY]) ;
Sub-Collections: SRI-ARC; Clerk: NDM; Origin: < MEYER,
ETSMEMO.NLS;11, >, 29-MAY-75 12:21 NDM ;;;; Obsoletes 32547
Title: ETS Memo Formatting Program Distribution: DAP JCN FEED####;
Obsoletes Document(s): 32547;

Implementation Subgroup, 1

A draft of ELF software specifications is being mailed today to NLCC members. A version of this document is available on-line under the NAVIMP directory as ELF-SOFTWARE. This document is about 25 pages long. If you wish a printout of the on-line version, you must use the output processor. 1a

To do this, first load the file ELF-SOFTWARE and then type: 1b

ot<cr>ynyn 1b1

Which echose as 1c

Output (to) C: Terminal OK/C: OK: 1c1

(Send Form Feeds?) Y/N: (Simulate?) Y/N: 1c2

(Waat at page break?) Y/N: 1c3

(Go?) Y/N: 1c4

Processing Output 1c5

You can interrupt the output at any time by typing ctrl o one or more times (i.e., depress the ctrl key and then hit the o key several times). The typing might continue for 30 seconds or so before stopping. 1d

If you don't want a hardcopy printout, you might want to take a look at the sections labelled PROLOGUE, III, and V. 1e

If you have any questions, call me. 1f

Regards, 2

Frank 3

Draft ELF Software Specs

(J32622) 29-MAY-75 19:18;;;; Title: Author(s): Frank G. Brignoli/FGB; Distribution: /NAVIMP([ACTION]) ; Sub-Collections: NIC NAVIMP; Clerk: FGB;

FGB 30-MAY-75 10:05 32624

On Line Specs (revisited)

Concerning the on-line draft of ELF software specs, please acknowledge receipt of this mornings message and let me know if you use NLS to look at the document (experiences, comments, suggestions, etc.) Thanks, Frank 1

On Line Specs (revisited)

(J32624) 30-MAY-75 10:05;;;; Title: Author(s): Frank G. Brignoli/FGB; Distribution: /NAVIMP([ACTION]) ; Sub-Collections: NIC NAVIMP; Clerk: FGB;

DCE 30-MAY-75 11:21 32625

To DVN re visit 16-17 Jun by Sanders for NSF OSIS

Dirk: As far as I now can tell, I will be here on those two days and would be interested in meeting Sanders. I'm not clear that we rightfully should spend so much time on him; I'd think that one full day would be a lot; half a day would seem more appropriate. Forinstance, the other day and a half would be very valuable spent planning EPC proposal, or DDPCS Community. Please see if you can strike a balance here, perhaps by calling Bamford to see how important he feels this is -- note that we have to press very hard to keep every hour of sold time we can these days. Regards, Doug 1

DCE 30-MAY-75 11:21 32625

To DVN re visit 16-17 Jun by Sanders for NSF OSIS

(J32625) 30-MAY-75 11:21;;;; Title: Author(s): Douglas C. Engelbart/DCE; Distribution: /DVN([ACTION]) ARC-LOG([INFO-ONLY]) JML([INFO-ONLY]) TLH([INFO-ONLY]) PWO([INFO-ONLY]) ; Sub-Collections: SRI-ARC ARC-LOG; Clerk: DCE;

PCB 30-MAY-75 12:36 32626

nak kinda

hi frank, i got you message re elf stuff, but date was 29 may not 30 may. there was also one dated 28 may. if you sent two messages dated 30 may, i only got the second. but dont xaksw....the net is bad today ... i was ripped off three time trying trying to send this...really bad..... hope you get this one...bye .....paul 1

nak kinda

(J32626) 30-MAY-75 12:36;;;; Title: Author(s): Paul C. Bishop/PCB; Distribution: /FGB([ACTION]) JDB2([INFO-ONLY]) AW2([INFO-ONLY]) ; Sub-Collections: NIC; Clerk: PCB;

RH 30-MAY-75 12:52 32627

Weekly Report for 5/27/75 - 5/30/75

I spent this week with Jeanne at ARPA. Jeanne has spent this time orienting me with ARPA's procedures and policies and introducing me to them and them to me. We helped one woman do editing and printing using TNLS (she has only used DNLS). I have already had requests to format the ARPA Orders like the MRAO's. (I have already given much thought to that this week). We also trouble-shooted some machine problems, made arrangements to have some equipment moved here from SRI-WDC, met with Connie about new and old projects and how she wants me to arrange my time here, distributed instruction sheets on different ways to print on the XGP, and worked with a couple of people who were using the new MRAO package. All in all a very interesting week.

1

RH 30-MAY-75 12:52 32627

Weekly Report for 5/27/75 - 5/30/75

(J32627) 30-MAY-75 12:52;;;; Title: Author(s): Rita Hysmith/RH;
Distribution: /US([INFO-ONLY]) ; Sub-Collections: SRI-ARC US;
Clerk: RH;

JGN 30-MAY-75 13:28 32628

RESPONSE TO MESSAGE ABOUT ON-LINE SPECS

FRANK,
I GOT BOTH MESSAGES
GREG

1

JGN 30-MAY-75 13:28 32628

RESPONSE TO MESSAGE ABOUT ON-LINE SPECS

(J32628) 30-MAY-75 13:28;;;; Title: Author(s): J. Gregory Noel/JGN;
Distribution: /FGB([ACTION]) ; Sub-Collections: NIC; Clerk: JGN;

AFMFORMAT assumptions and questions

Basic assumptions 1

1. That all Main paragraphs will be at level 1 in a file. 1a

Note that the word "Chapter" and its number followed by the title of the chapter will be supplied by the program. Presumably the file is named "VOL#" where # is the chapter number and VOL is the roman numeral of the chapter. Other identification information may be placed in the origin statement without fear of it showing up in the formatted file. 1a1

2. Floating level one section headers are appended to succeeding level one numbered paragraphs. 1b

3. The Bold Face for main paragraphs is always terminated after the second period and there are no double pound signs in the file as they are unnecessary. 1c

Questions: 2

What is the first date called as apposed to the "Effective date"? 2a

A: The Publication Date. 2a1

What is the page width and height?
Top Margin
Bottom Margin
Left Margin
Right Margin
Space following header: 2b

Do you know with double columns that they currently must be adjusted by hand at the terminaton of every double column format? 2c

Do you ever have more than five levels (go below the underlined numbers). 2d

Are you sure you want VOL instead of Vol in header ?? 2e

For display purposes, could I have the name of a chapter that has five levels in the file and has the typos edited out? 2f

KIRK 30-MAY-75 19:43 32629

AFMFORMAT assumptions and questions

(J32629) 30-MAY-75 19:43;;;; Title: Author(s): Kirk E. Kelley/KIRK; Distribution: /EAR([ACTION]) DVN([INFO-ONLY]) EKM([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: KIRK;

LTS 31-MAY-75 07:08 32630

work activities

my terminal has started to misbehave so i am not sure how long i will be able to use it this weekend. oh well.i went into you directory last night to see traidex. interesting file. where did you get all that information? if you have time this weekend take a look at specs in my directory. i told harry i would send him design ideas about the contract monitoring systembefore i left for florida. i am going to xerox the file manday morning and send it to him. if you have any ideas i will incorporate them. 1

work activities

(J32630) 31-MAY-75 07:08;;;; Title: Author(s): Lorraine T. Sinnott/LTS; Distribution: /LCS([ACTION]) LCS([INFO-ONLY]) ; Sub-Collections: NIC; Clerk: LTS;

LCS 31-MAY-75 20:07 32631

Ref your memo of 5/31

My terminal is also misbehaving, so perhaps it is hereditary.
I printed your file SPECS, and it looks good to me. I have no specific comments; only that O'Neil will probably not want to go through any complex procedures, unless you are the one to carry them out.
Apparently neither of us has figured out how to read each others files; I had to log in under your ident in order to get SPECS, and I assume you had to go through a similar procedure.
I want to print ININFO and SCREEN Sunday night, so let me have your comments as soon as possible.
Bon chance.

1

LCS 31-MAY-75 20:07 32631

Ref your memo of 5/31

(J32631) 31-MAY-75 20:07;;;; Title: Author(s): Leonard C. Swanson/LCS; Distribution: /LTS([ACTION]) ; Sub-Collections: NIC; Clerk: LCS;

about the interviews....

i have finally examined the files. i have some concerns. (1)time! we are about to embark on the interviews and have not sent out this questionnaire yet. we are requesting alot of information in INTINFO. we might have a chance a at getting it back if we had more time to harrass respondents. we can attempt to get it but should form a backup plan. for example maybe a sort form telephone interview of mailed checklist. (2) the information requested in INTINFO we have to be conveyed on a more detailed questionnaire form than is outlined. for example we will have to determine what we mean in 6 and adequately canvey this request to the respondedant. i do not know how tc edit a message. hence all the spelling mistakes. hope you can make this out. my terminal exploded last night. this is the second time i bring home a terminal and the second time i return it to david broken. i'm not sure he's going to keep trusting me with these devices. presently i am working on his terminal at ets. i am going to go home now. can you call me tomorrow sometime about when we will leave. i guess we can make up our game plan on the way to the airport . if you think we should get together before then i'd love to have lunch with you. see you tommorrow. 1

about the interviews....

(J32632) 1-JUN-75 12:26;;;; Title: Author(s): Lorraine T. Sinnott/LTS; Distribution: /LCS([ACTION]) LCS([INFO-ONLY]) ; Sub-Collections: NIC; Clerk: LTS;

LTS 1-JUN-75 12:42 32633

some answers

(1)i have written the paragraphs. they are in my directory under INTINFO. (2)i did have to log in under your id to see your files (3)i do not understand sort so can't give cnstructive way to use it on mailing list. i'll talk to david tommorrow when i bring back the remains of the terminal. have you contacted bbn about the doumentation? (4)i am not coming on the paper. for some reason the topic area is not very exciting to me. also i have had so many items above it on my priority list, like writing you messages. 1

some answers

(J32633) 1-JUN-75 12:42;;;; Title: Author(s): Lorraine T. Sinnott/LTS; Distribution: /LCS([ACTION]) LCS([INFO-ONLY]) ; Sub-Collections: NIC; Clerk: LTS;

1. Committee selection 1

The system is being used to record and maintain information on people who are being considered for membership on a committee. The names were originally entered from notes and memos suggesting nominees. After sorting the names, addresses and information about each nominee were entered. Periodically additional information was added. The aggregate list was then printed so that several people could "rate" the nominees and selct their top choices. The consensus of these choices were then culled from the original file and put into a second file, which will be used to record expanded biographical data and prepare a summary report listing the desired names in order of selection. 1a

2. Mailing List 2

We are about to use the system to enter a 700 name mailing list and sort it (geographically) in order to remove duplicates. The result will be used to prepare mailing labels for distribution of project reports, and to produce listings of subsets of names. We expect to maintain the mailing list on OFFICE-1 (i.e., to add to it and make address changes). 2a

3. Book 3

Two associates and I are beginning work on a textbook, and we expect to use the system, at least in part, for preparation of the text. I have entered a topical outline, with notes; we will subsequently divide the list of chapters and work independently on each, but with review, comments, and modifications by the other two authors. 3a

4. Report 4

I have used the system to prepare several working documents and one (breif) formal report. The report was prepared in several stages, with intermediate external review. The first step was to enter the topics (sections and subsections) and basic content. I next wrote sections (at random) as they occurred to me. After two editings and one restructuring of the file it was prepared for output and distribution. The result is now being reviewed and will probably be further modified before final printing. 4a

5. Joint Papers 5

Loraine Sinnott and I are working on three documents which we expect to prepare jointly. Initial drafts of each have been entered by me, and she will modify them and/or suggest changes through the system. 5a

6. TRAIDEX scratch pad (information management) 6

I have created a file to maintain miscellaneous information related to one of my projects. The file contains a list of key people (with addresses and phone numbers) related to the project, a bibliography of relevant reports and documents, a set of notes on various phases of the project, and a list of project milestones and date-related events. 6a

(J32634) 1-JUN-75 13:30;;;; Title: Author(s): Leonard C. Swanson/LCS; Distribution: /DAP([ACTION]) LCS([INFO-ONLY]) LTS([INFO-ONLY]) ; Sub-Collections: NIC; Clerk: LCS; Origin: < SWANSON, SYSUSE.NLS;2, >, 1-JUN-75 13:27 LCS ;;;;####;

Use of OFFICE-1

1. Committee selection 1

The system is being used to record and maintain information on people who are being considered for membership on a committee. The names were originally entered from notes and memos suggesting nominees. After sorting the names, addresses and information about each nominee were entered. Periodically additional information was added. The aggregate list was then printed so that several people could "rate" the nominees and selct their top choices. The consensus of these choices were then culled from the original file and put into a second file, which will be used to record expanded biographical data and prepare a summary report listing the desired names in order of selection. 1a

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4. Report 4

I have used the system to prepare several working documents and one (brief) formal report. The report was prepared in several stages, with intermediate external review. The first step was to enter the topics (sections and subsections) and basic content. I next wrote sections (at random) as they occurred to me. After two editings and one restructuring of the file it was prepared for output and distribution. The result is now being reviewed and will probably be further modified before final printing. 4a

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I have created a file to maintain miscellaneous information related to one of my projects. The file contains a list of key people (with addresses and phone numbers) related to the project, a bibliography of relevant reports and documents, a set of notes on various phases of the project, and a list of project milestones and date-related events. 6a

Use of OFFICE-1

(J32635) 1-JUN-75 13:50;;;; Title: Author(s): Leonard C. Swanson/LCS; Distribution: /DAP([ACTION]) LTS([INFO-ONLY]) LCS([INFO-ONLY]) ; Sub-Collections: NIC; Clerk: LCS;

Use of OFFICE-1, second memo

Dave -
I sent you a file called "SYSUSE" containing the requested write-up on what I am doing with OFFICE-1. I had trouble sending a "file", so this note is written in case you don't get the first memo. 1

Use of OFFICE-1, second memo

(J32636) 1-JUN-75 14:21;;;; Title: Author(s): Leonard C. Swanson/LCS; Distribution: /DAP([ACTION]) ; Sub-Collections: NIC; Clerk: LCS;

mailing list

FGB 2-JUN-75 06:24 32637

The file NAVIMP-GROUP contains names, addresses, etc. of NAVIMP members. Please check it and let me know if your entry is correct. Thanks, Frank

1

FGB 2-JUN-75 06:24 32637

mailing list

(J32637) 2-JUN-75 06:24;;;; Title: Author(s): Frank G. Brignoli/FGB; Distribution: /NAVIMP([ACTION]) ; Sub-Collections: NIC NAVIMP; Clerk: FGB;

BRL Slot/MIPR

DLS 2-JUN-75 08:59 32638

I haven't heard from you since 13 APR, when you thought you would have a MIPR out in a week or so. Obviously you didn't make it. $20K this year and 20 next is still OK. Our procurment has been grinding away, and is ready to sign the contract. They want to know if you are in or not, because the contract now being negotiated reads as if you were. You have been using the system, haven't you? Appreciate a reply today, or before 09:00 tomorrow, when I have to meet with them again.
Thanks
Stoney

1

DLS 2-JUN-75 08:59 32638

BRL Slot/MIPR

(J32638) 2-JUN-75 08:59;;;; Title: Author(s): Duane L. Stone/DLS; Distribution: /SMT([ACTION]) ELF([INFO-ONLY]) ; Sub-Collections: RADC; Clerk: DLS;

FGB 2-JUN-75 11:54 32639

ELF INFO

The file ELF-MSG contains information on the ELF directory at SRI-AI and on assembling ELF sources. Read it if you wish; it will go away at weeks end. Regards, Frank 1

FGB 2-JUN-75 11:54 32639

ELF INFO

(J32639) 2-JUN-75 11:54;;;; Title: Author(s): Frank G. Brignoli/FGB; Distribution: /NAVIMP([ACTION]) ; Sub-Collections: NIC NAVIMP; Clerk: FGB;

EJK 2-JUN-75 13:54 32640

Getting to NLS on the IMLAC with the new TENEX 1:33

If you don't use the IMLAC forget it!

EJK 2-JUN-75 13:54 32640

Getting to NLS on the IMLAC with the new TENEX 1:33

Until modified by SRI the following procedures are necessary to use the IMLAC in the IMLAC mode. 1. login 2. Type wid 62<cr> 3. Type imlac<esc><cr> 4. Type y 5. Type lower<cr> 6. Type nls<cr> 7. After the seven appears in the numbers on the top of the screen ie. 003000780, use the control 6 so that the numbers read 003006780. 8. Carry on.

1

EJK 2-JUN-75 13:54 32640

Getting to NLS on the IMLAC with the new TENEX 1:33

(J32640) 2-JUN-75 13:54;;;; Title: Author(s): Edmund J. Kennedy/EJK; Distribution: /RADC([ACTION]) JCP([INFO-ONLY]) JCN([INFO-ONLY]) ; Sub-Collections: RADC; Clerk: EJK;

EJK 2-JUN-75 14:41 32641

VERSION TWO: Getting to NLS on the IMLAC with the new TENEX 1:33

Since I sent out the last Journal Mail item Jeff Peters has made some changes. If you don't use the IMLAC forget it!

EJK 2-JUN-75 14:41 32641

VERSION TWO: Getting to NLS on the IMLAC with the new TENEX 1:33

Until modified by SRI the following procedures are necessary to use the IMLAC in the IMLAC mode. 1. login 2. Type wid 62<cr> 3. Type imlac<cr> 4. Type y 5. Type nls<cr> 6. After the seven appears in the numbers on the top of the screen ie. 003000780, use the control 6 so that the numbers read 003006780. 7. Carry on. NOTE: It will be necesary to use the control 7 to get rid of the seven when you go to TENEX. ALSO, it does not appear to me to be possible to get to TENEX using the control C. You literally have to use the command GOTO TENEX. 1

EJK 2-JUN-75 14:41 32641

VERSION TWO: Getting to NLS on the IMLAC with the new TENEX 1:33

(J32641) 2-JUN-75 14:41;;;; Title: Author(s): Edmund J. Kennedy/EJK; Distribution: /RADC([ACTION]) JCP([INFO-ONLY]) JCN([INFO-ONLY]) ; Sub-Collections: RADC; Clerk: EJK;

JGN 2-JUN-75 16:01 32642

fix on mailing listElf directory

i fixed the info about me in the mailing list. and updated it for a change. thanks for info on elf-msg -- dana will like it. 1

JGN 2-JUN-75 16:01 32642

fix on mailing listElf directory

(J32642) 2-JUN-75 16:01;;;; Title: Author(s): J. Gregory Noel/JGN;
Distribution: /FGB([ACTION]) ; Sub-Collections: NIC; Clerk: JGN;

IMM 3-JUN-75 08:46 32647

FUTURE OPPORTUNITIES IN TELECOMMUNICATIONS

Lawrence H. Day

Paper Presented at the World Future
Society Second General Assembly
June 4, 1975
Bell Canada

Room 1105
620 Belmont St.
Montreal, Quebec

FUTURE OPPORTUNITIES IN TELECOMMUNICATIONS

Lawrence H. Day

Paper Presented at the World Future Society Second General Assembly

June 4, 1975

Introduction

The purpose of this paper is to outline several areas where the future use of existing and new telecommunications services is going to have a significant impact on society in the next two decades. The limitations of a short paper such as this force the discussion to be superficial in nature and reduced to a review of only the most obvious impacts. (1) The emphasis is on the societal benefits rather than the business opportunities that will exist in these areas. The complex questions in the legal, regulatory, and competitive impacts will also be ignored here even though it is recognized that they will have a major impact on how and who delivers many of the services that will provide the benefits discussed. Similarly, the important area of detailed cost/benefit calculations will be left for other analyses.

The paper begins with a brief overview of the author's definitions of several key terms. This introductory overview is completed with a short review of some of the telecommunications service areas that will provide the technological thrust for the applications discussed. The first impact area is that of the potential of future substitution of certain travel activities by telecommunications and the impacts that may result from that process. The emphasis here will be on the energy and environmental implications of this substitution process. The next impact area reviewed is in the area of productivity improvement. This will be a key concern with the continuing economic crises of inflation, unemployment, international discontinuities in trade, and resource shortages. The third opportunity is in the field of the delivery of medical services. Various telemedicine capabilities may enable the delivery of health care on a more

widescale and equitable basis in the future. Finally, the implications of telecommunications systems on the international transfer of knowledge and technology will be reviewed.

The paper will, in many cases, draw upon the research of the author's Business Planning Group in Bell Canada. (2) This is a long term technological forecasting and assessment organization operating in the Headquarters of Bell in Montreal, Quebec. This group has conducted numerous studies over the past decade in attempting to determine future courses and impacts of telecommunications systems. Where possible, references will be given to the source of particular forecasts or impact analyses.

Definitions

A brief review of the technological section of this paper reveals that the working definition of the term "telecommunications" is a broad one. This working definition states that telecommunications consists of all means to impart information at a distance through the transmission of electromagnetic wave symbols. (3) The emphasis on assessing the future impacts of telecommunications systems is the prime reason for choosing an all-inclusive definition. We are not interested in trying to draw a legal or regulatory line between computer and communications systems, even though that is an important distinction for some purposes. We are also not concerned with attempting to define a technical distinction between computer and communications systems. The impact of telecommunications systems in the future will be the combined result of the uses of the computer and communications segments of modern teleprocessing systems. Any attempt to separate the roots of most of the impacts of these systems would be an academic exercise.

This definition does exclude broadcast radio and television communications. These are one-way systems with broadly defined audiences. Telecommunications systems are directed towards transmitting information between specified audiences, and two-way interaction is expected.

Technological Issues

The telecommunications technologies that will create the opportunities for social benefits in the next two decades are reviewed below. This is only a cursory overview of some of the key thrusts in technological and service development. The references shown in the footnotes will lead the interested reader to more detailed examinations of each of the systems that are examined.

FUTURE OPPORTUNITIES IN TELECOMMUNICATIONS

Two-way Broadband Systems (4)

Most of the literature in this field has been concerned with an expansion of the capabilities offered by co-axial cable currently being used to deliver cable TV signals. These broadband channels can be converted to interactive applications through the use of additional electronics to provide low speed (audio grade) or broadband (video grade) return paths from the receiving location to the central distribution point (the "head end"). These return path capabilities can also be provided through the use of the regular telephone network. The significance of these systems is that they create the ability to deliver "on demand" selective visual information over the broadband channels. These systems have the theoretical capability over time to add random switching so that each subscriber can call any other subscriber in a fashion similar to telephone calls today. These calls could be audio, audio-graphic, or audiovisual in nature. It is still questionable whether the providers of cable systems will invest the additional capital required to provide these types of capabilities. The recent financial difficulties in the cable TV industry have strengthened the view that widespread use of interactive television into the home is further off than many have predicted in the past few years.

The availability of a host of consumer-oriented capabilities has been forecasted by those expecting the development of a "wired city" (a misnomer since most cities are already wired for power and telephone systems). These services include:

remote shopping

remote banking

electronic security services

electronic education

electronic voting

consumer information retrieval systems

remote medical systems

Visual Telecommunications Technologies

The development of visual telecommunications services is taking place on many fronts. Interpersonal visual communications can take the form of randomly switched calls between individuals

using a technology such as the US Bell System's PICTUREPHONE . Interpersonal visual communications can also take the form of point-to-point teleconferences between groups of individuals using studio-based systems such as CONFRAVISION in the UK or Bell Canada's CONFERENCE TV system. The CONFRAVISION system has recently been extended to Sweden, and other European countries are reported to be planning to join this growing network. In the US, the Bell System has introduced a three city (Washington, New York, and Chicago) conference television based upon PICTUREPHONE technology. The Australian Post Office has also been using a CONFRAVISION system for several years.

The systems discussed above are all directed toward inter-city communication. The question of intra-city video conferencing has also been tested but not on such a widescale basis. The Metropolitan Regional Council in the New York City area has been using a multiple location video conference network for local use during the past several years. This system has been used in the New York City area for electronic meetings between the local politicans, civil servants, and for remote training sessions. (5) Interactive television systems (audio return paths only) have been used at Stanford University and The University of Southern California for several years to reduce student travel to classes or provide educational training to employees right at their remote job locations. Both inter- and intra-city systems offer the ability to interact with images of speakers at remote locations and to share pictures, diagrams, and graphics.

Communications Satellites

Communications satellites have grown from experimental vehicles to key components of national and international communications systems in the past decade (both for broadcast and interpersonal communications). Canada was the first country in the world to use synchronous orbit domestic satellites for broadcast and interpersonal communications within a nation. While there are abundant east-west communications systems within Canada, the satellite permits communications into the far north of Canada where other systems could only provide delayed broadcast or periodic telephone service. This technology is viewed as an important means of linking residents of the North into the communications mainstream of Canadian life. In the US, domestic satellite service has recently been introduced by the Western Union Company. This system will also provide nation wide telecommunications service to both end users and other common carriers.

Information Storage and Retrieval Systems

FUTURE OPPORTUNITIES IN TELECOMMUNICATIONS

Communications technologies in themselves are not the only technologies that will have an impact upon society. The complex merging of computer power and communications systems is leading to a whole new order of significant technologies. The development of "on-line" (ie communications linked) time sharing systems that provide a host of personalized information storage and retrieval capabilities, text editing, and computational power is creating the possibility of utilizing remote work centers with the required access to computer systems needed to accomplish a task. Developers of very advanced, but user-oriented (the "dumb" user from a computer viewpoint) systems see them as creating "augmented knowledge workers" over time. (6) They foresee an evolution in work styles and capabilities as knowledge or post-industrial workers utlilize the power in these systems. This could have considerable impact upon future patterns of social interaction since these systems can be routinely accessed from any location that has a telephone. (7)

Computer networks

The evolution of several advanced forms of computer networks in North America will reinforce the tendencies outlined in the above section. Linking through relatively inexpensive communications networks permits specialization of computer capabilities at various geographic locations. The Advanced Research Projects Agency (ARPA) has financed the development of one such system in the USA which is now being extended (via satellite) to Europe, Hawaii, and the Far East. (8) This "resource sharing" of specialized computer systems will assist in further augmentation of knowledge workers . Several commercial versions of these forms of computer networks are being introduced in the US. The Trans-Canada Telephone System is also introducing a common user packet switched data network in the next year. Plans for similar experimental networks have been also announced by most European telecommunications authorities and by the Japanese telecommunications organization.

Computer-Augmented Conferencing (CAC)

CAC connects a number of individuals with computer terminals to the computer in a synchronous or asynchronous mode, permitting them to approximate the interactions that they might experience if they were engaged in face-to-face communication as well as providing new capabilities not currently available with face-to-face or electronic communications. The number of participants in a computer-augmented conference can vary from two to as many as twenty or more. Since the communications process is asynchronous, many conferees can input their comments to the

conference at the same time; when they have finished inputting, the computer delivers the messages that have arrived during the input phase. A text editing facility may also be included in the CAC package. (9)

Other Technologies

This analysis of the technological issues that are stimulating interest in the future of telecommunications is only a brief overview of the possibilities that are emerging. Each of the technologies discussed above can be explored in much greater detail in the various references given. Many other relevant technologies which will have a bearing on the future have not been discussed. These include: intelligent terminals, video discs and cassettes, audio cassettes, video data banks, audio data banks, computer based education systems, facsimile transmission, graphic communications, still frame TV transmission, artificial intelligence systems, and voice input to computers. The main purpose of this section of the paper was not to be all-inclusive, or to review any particular technology in detail, but to give a flavor of the trends that are currently underway

Travel/Communications Substitution: Energy and Environmental Impacts (10)

The potential of future communications based systems to stimulate some form of substitution for travel is a frequent subject of discussions of the future environment. Most forecasts seem to lie at each end of a spectrum of possible analyses. At one end there are broad generalized scenarios optimistically postulating many forms of substitution of local and intercity travel through the use of a host of computer/communications services. The links between today and the future are not usually detailed and we are left with considerable uncertainty as to how this future communications based society evolved. The economic, social, and political benefits or potential negative impacts of this substitution process are also not examined in any detail. At the other extreme there are very specific studies of how specific technologies may augment the substitution process for individuals working at certain institutions with defined travel patterns. Between these two poles there is a considerable knowledge and research gap. Several projects underway at Bell Canada and in other institutions are designed to help fill this knowledge gap. While many of the activities described here are Canadian or American, the author recognizes that parallel activities are also underway in Europe and Japan.

FUTURE OPPORTUNITIES IN TELECOMMUNICATIONS

The question of substitution may be regarded as generic in the case of a macro-analysis. However, our futures research and that of others has indicated that the subject should be examined on two levels of substitution: inter-urban and intra-urban. Inter-urban substitution refers to the process of replacing certain types of intercity travel with communications and computer based services. This travel is usually that of businessmen, government officials, or educators for defined occupational purposes. Intra-urban substitution refers to the process of replacing a wide variety of activities within an urban area with a large number of electronic services. These forecasts usually include replacing daily commuting to work with "electronic offices" in the home or in neighborhood work centres. Electronic education, security, banking, shopping, voting, and consumer information retrieval services are also envisioned within the urban area in order to reduce the need to travel for many routine activities. Much of the research and speculation in this area is found in the "Wired city" or interactive broadband systems literature.

The phrase "substitution" is used here as a shorthand expression that refers to very complex, mostly unknown (to date), relationships between the transportation and communications sectors of our society. This relationship is not new, of course, as these two sectors have been intertwined in a maze of relationships since the development of postal, telegraph, and telephone services. Research on the impacts of these old communications services upon personal travel has been extremely limited to date. The simultaneous rapid growth in the use of modern communications and transportations systems during the last few decades in North America has masked the development of interrelationships between these two sectors. Studies have indicated that those who travel a great deal also use communications systems frequently. Thus, existing communications and transportation systems appear to be mutually re-inforcing. However, many argue that the rapid proliferation of new communications technologies when combined with the current crises, congestion, and negative side-effects of many transportations systems will lead to a new era of substitution.

Neither should the phrase substitution be interpreted too narrowly in terms of face-to-face personal contacts. (11) While certain existing face-to-face contacts may be replaced in the future with new technologies, new forms of communications systems may create the ability to undertake activities that are impossible today with face-to-face contacts or existing technologies. Thus, substitution processes may, in fact, serve latent needs that have not been served up to now.

FUTURE OPPORTUNITIES IN TELECOMMUNICATIONS

The question of travel/communications substitution is not just a point of academic theory. Many recent studies have concentrated upon this impact area. For example, a recent survey of 9600 business travellers , who were surveyed while in the act of travel, found that 20% of them were willing to substitute the existing trip they were on with various types of telecommunications alternatives. The details of this study, conducted by the Business planning Group of Bell Canada, are reported elsewhere, (12) The overall finding is recounted here to stress the point that the concept of substitution is viable today in the minds of many business travellers and can be expected to grow in the future.

There are a host of inter-relationships and impacts associated with the substitution process. These range from the cost-benefit trade offs that may accrue to the substitutor through to the impacts on family life styles and corporate patterns of decision making. The author has discussed these elsewhere and will not repeat them here. As noted in the Introduction, the prime focus in this paper is on the societal impacts that may accrue through the use of telecommunications systems. The prime impacts here are in the energy and environmental areas.

There are many environmental and energy issues related to travel and transportation systems. These have become increasingly important in public and private policy determination in the past decade. One forecast is that these factors may lead governments to promote or encourage communicating rather than travelling in the future. This could be through a wide variety of administrative mechanisms, including ones that may alter the economic cost/benefit ratio in favor of communications alternatives.

The environmental costs associated with transportation systems have become identified in considerable detail in the past decade. Current research is expanding information on these issues at a rapid pace. The environmental considerations associated with communications systems are virtually unknown, although recent interest has been expressed on the subject. Analysis that has been undertaken to date leads us to believe that these costs are far less on a per capita user basis than those for transportation systems. (13)

Any comprehensive analysis of the environmental costs associated with travel and communications systems must go beyond an examination of operational costs of visible structures. The costs of construction of the physical plant required to provide these services should also be included. The environmental costs

associated with maintaining the required infrastructures are required as well.

The phrase "environmental costs" has been used to refer to a wide variety of issues. The list below is not exclusive but it gives an indication of the types of environmental costs that are associated with the use of transportation and communications systems. These factors will have to be added to the economic and behavioral ones in order to provide an adequate analysis of the overall question of inter-urban and intra-urban substitution:

a) energy consumption of transportation or communications systems (increasingly important with the North American and European "energy crisis"),

b) energy consumption required to construct, operate, and maintain the manufacturing plant, and industry infrastructures for both sectors.

c) resource consumption for construction, operation and maintenance of the required infrastructures.

d) pollution factors associated with the two industries, eg, air, water, radiation, noise, thermal, and visual pollution.

e) damage to ecological systems. (14)

As noted above, the energy implications of transportation systems are relatively well known. The Business Planning Group has reviewed the literature in this area and recently published a report on the Canadian view of the energy implications of passenger transport systems. This report fills in one half of the equation in our attempt to quantify the overall energy impacts of travel/communications substitution.

The basic findings of our research indicate that the transportation sector of the economy accounts for 24% of the total energy consumed in Canada. The passenger sector accounts for 60% of that energy consumption. Over 90% of all Canadian passenger miles are accounted for by motor vehicle and air transport. Both of these forms of transportation are very energy inefficient. The importance of examining the business sector of passenger travel, as in the Business Planning survey, is shown by the fact that 25% of all passenger travel is for business purposes (60% of all air travel is for business reasons). (15) The influence of the transportation sector on total national energy consumption levels indicates the possibilities for energy

conservation through reduction of some forms of travel by communicatons substitution.

The task ahead is to identify the energy impacts of communications systems use. Research interest in this area has been growing rapidly. The "energy crisis" has led to many comments in the general and specialized press on the potential for some form of energy conservation through travel/communications substitution. Peter Goldmark , former President of CBS labs, recently stated that if we "eliminated commuting over 10 miles, I have calculated that we could save half our current consumption of gasoline while generating only negligible amounts of pollution". (16) He also goes on to argue that creating a "New Rural Society" (use of the technologies described above to reduce business travel and commuting to work) would reduce the need for expanding large cities and would also reduce the energy required to support their centralized infrastructures- air conditioning, heating, lighting, elevators, etc. (17) Goldmark's calculations , and those of all of the research in this field currently, are rough but they indicate the order of magnitude of the potential savings.

Another macro analysis has been undertaken by the Office of Telecommunications in the U.S. Department of Commerce. They forecast that a 18% reduction in various categories of travel would result in a 5% reduction in U.S. gasoline consumption. (18) The travel substitution estimates certainly appear reasonable when the potential propensity for substitution determined in the Bell Canada survey is recalled.

These overview calculations give a perspective of the global implications of large scale travel/communications substitution. Several studies have tried to examine this from the opposite perspective: the impact of substitution for specific trips using defined technologies. One of these studies has been undertaken by the Communications Studies Group (CSG) of University College London and the London School of Economics in conjunction with their work for the U.K. Post Office. (19)

The CSG approach is to calculate the energy consumed in particular journeys using various forms of transportation. This requires estimates of the number of people travelling to a meeting which is a key variable for the transportation/energy consumption calculations. One of the difficulties in this form of estimate is that the number of people at one location for a teleconference is not a cost or energy consumption variable. The incremental cost of adding people on to an audio or video teleconference is virtually zero and hence, additional people may

attend a teleconference more cheaply than in person. On the other hand, the length of a meeting within a reasonable period (eg., 1 day) is a key variable for the energy consumption of telecommunications alternatives and a fixed cost item for transportation systems.

The CSG researchers considered their own survey's of the behavioral propensity to substitute, and developed an estimate on the potential overall energy savings on the London to Glasgow route. Their assumptions include a mix of audio and video teleconferencing and a conservative estimate of the level of substitution. They estimate that 20% of the energy presently used for business travel on that corridor could be saved through substitution (1.1×10^{-8} Kwh). (16)

Similar calculations have been made by Dickson and Bowers in their preliminary technology assessment of the Video Telephone conducted at Cornell University.(21) Dickson calculated that an 8 hour teleconference between Los Angeles and New York was 8 times as energy efficient as a return personal trip using a Boeing 747.

While energy issues are important, there are other environmental issues that should be considered in the travel/communications equation. Pollution is certainly one of these factors. Van Vleck points out that the transportation sector produces 75% of the carbon monoxide, 56% of the hydrocarbons, and 52% of the nitrogen oxide pollutants. (22) These side-effects of travel must be shared by all in our society, not only those who travel.

The question of resource consumption has also become more widely understood as planners and decision makers become more aware that we have a finite stock of non-renewable resources and that the demand is outstripping the replacement of renewable resources. The transportation sector is an important consumer of many of these resource elements. Recycling will have to become more prevalent in the transportation industry in order to preserve material resources. Substitution is another means of conserving resource depletion. Again , we do not yet have material consumption patterns available for telecommunications but we do have some idea of the facts for the transportation sector. The US transportation industry consumes 75% of the nation's rubber, 53% of its lead, 40% of its zinc, 29% of its steel, and 19% of its copper. (23) Further research is required to determine the communications industry's consumption patterns and the elasticity of the resource trade-offs between the transportation and telecommunications industries.

The energy, pollution, and material elements of the substitution equation are certainly incomplete at this time. We can obtain an idea of the relative impact of various trade-offs through the preparation of scenarios assuming levels of substitution. As the next two decades unfold we can expect significant increases in travel communications substitution on both an intra and inter-urban basis. This will result from millions of individual and institutional decisions as well as from pressures exerted by governmental bodies. This pressure will increase as our knowledge of the societal benefits that result from the tradeoffs increases. The primary impacts of this process will be energy savings and a reduction in the rapidly expanding environmental and resource utilization costs imposed upon society through travel and transportation.

Telecommunications and Productivity

The issue of productivity improvement in domestic economies is one of long standing concern. Productivity is basically the act of getting more output from the same or lessor amounts of inputs. Productivity improvements are often gained by investing more capital in equipment or technologies which enable the workers to produce more, even though the cost of labor itself is a continuingly rising one. Productivity is also a concept that is usually identified with the production of goods. More and more this is an outmoded concpt as the North American economy becomes a service economy and it moves toward the "post-industrial society".

The basic concept of the post-industrial society was developed by Daniel Bell, a noted U.S. sociologist and futurist. Bell is also the chairman of the Commission on the Year 2000 of the American Academy of Arts and Sciences. He has recently written a book which explores the scope of this concept: The Coming of Post-Industrial Society: A Venture in Social Forecasting. In that book Bell outlines five dimensions of this concept:

"1. Economic sector: the change from a goods-producing to a service economy;

2. Occupational distribution: the pre-eminence of the professional and technical class;

3. Axial principle: the centrality of theoretical knowledge as the source of innovation and policy formulation for the society;

4. Future orientation: the control of technology and technological assessment;

5. Decision-making: the creation of a new 'intellectual technology'." (24)

The concept of the post-industrial society has become widespread in the futures literature. In most cases it is not defined in the depth undertaken by Bell. Use of the term usually indicates that the author is referring to an emerging service/information/knowledge based society that is in the process of being formed out of the existing mass consumption economies. This new society is regarded as an evolutionary step rather than a revolutionary one. It does not imply that many other forms of civilization will not co-exist in the world at the same future time period. It is not necessarily "best" for all , although it could be less energy intensive, less a consumer of scarce materials , and more conscious of human values than earlier eras.

The concept of productivity in a post-industrial society is an important one but one that has to be refined. (24) The "worker" is more likely to be a managerial or knowledge worker as opposed to the production line employee of the past. The process of getting more output from the same input is different. If we assume that the knowledge worker produces a measurable output, how can we increase that output with the same amount of labor? Information and telecommunications technologies appear to offer significant promise in this area.

The promise of information and telecommunications technology for productivity improvements in the service based post-industrial society becomes clearer when we examine the key sectors of that society. Government is the largest sector of the service economy. Although it is often fashionable to despair of any improvements in government efficiency, many departments and agencies are becoming very conscious of the benefits that accrue to the wise users of telecommunications and information systems. Traditionally, governments have been the largest consumers of telecommunications services and we can expect this to continue. Perhaps it is easier to examine new application areas than to try to untangle the existing framework and evaluate the benefits of telecommunications systems.

Some of the important new application areas will be in the local government field. Federal, state, and provincial governments have utilized information systems for some time. City governments are starting to utilize systems in order to solve their own

problems which are often unique to local government. For example, proposals have been developed to use interactive cable systems in Los Angeles to provide effective local service outlets verses centralized city hall services. (25) These services, many of which will be offered in ghetto areas, have only been availableat a central city hall in the past and were not well utilized by residents. The use of these services often resulted in long time consuming travel and waiting by the citizens. The use of electronic city halls in the service consuming neighborhoods will result in a more productive use of the time of both the citizens and the civil servants. The tri-state two way televison system used in the New York area has resulted in more effective training and education for public servants and a reduction in local time consuming travel by city officials for routine meetings. There are many more similar types of experiments underway or proposed. The late seventies will see continued experimentation and the next two decades will see widescale adoption in large urban areas. These systems should contribute towards the goal of improving productivity in the local government sector.

The industrial sector of the service economy can benefit significantly from the judicious use of telecommunications based systems. The transportation sector is one of the largest in the economy and cannot be expected to be reduced too much, even with new government policies and some measure of travel/communications substitution. The use of effective information systems can help track the flow of freight much more effectively. Better freight control can result in smaller inventories in business and hence a more productive use of one of the scarcest resources: capital. The use of mobile communications in local transport systems for both people and goods transfer can result in less wasted motion and hence a smaller energy and economic cost.

The finance, banking, and insurance industries are among the giants today and will remain so in the post-industrial age. The dependance of these industries upon information and telecommunications systems is well documented. In many ways they are models of the future and illustrate how other parts of the service sector will look to telecommunications for productivity improvements.

The field of education will also benefit from information technology. Links to computer based education systems will help supplement regular classroom training. Two way television systems will help students to attend classes remotely from their job locations or homes. These types of systems already exist at Stanford University and the University of Southern California. Many more will develop in the next two decades. Information banks

will aid in academic research and the organization of knowledge. As the pressure on educational budgets increases, educational administrators will turn towards these systems in order to improve productivity in the educational sector of the post-industrial society.

This examination of the traditional economic sectors overlooks the fact that the information sector will be an important one in its own right. It is interesting to note that the older sectors of this industry, as opposed to the new members such as time sharing companies, data base organizations, and specialized common carriers in the telecommunications field, are turning to telecommunications and information technologies in crucial attempts to resolve internal productivity issues. These charter members of the post-industrial society who are looking at telecommunications based systems as lifelines include post offices, book and magazine publishers, newspapers, and telegraph companies. The new rapidly expanding organizations in the information industry are growing precisely because their services improve the productivity of their client organizations.

The information industry has one vital characteristic that will have an important influence on the national economy as information becomes a key sector. The consumption of an information product does not result in the consumption of the raw resources required to create it. Hence, a data bank can be accessed by many users, computer software can be recreated in new locations for a minor fraction of the cost of its original development, and educational programs can be recyled many times. An economy that has information creation and consumption as an important sector will be less dependant on energy and resource consumption, less damaging to the environment, and less dependant on international trade fluctuations. All of these issues have important productivity implications.

Once again, this overview of a future impact of telecommunictions based systems has only been cursory in nature. These issues have been explored elsewhere at greater length and rigor. However, it is hoped that these brief comments have indicated how one of the important opportunities in the future for telecommunications lies in the area of productivity improvement in the evolving service-based post-industrial economy.

FUTURE OPPORTUNITIES IN TELECOMMUNICATIONS

Future Impacts of Telemedicine

The delivery of medical services to patients is one of the most important functions of a modern society. Medical parctice has changed from the individual general practitioner serving those in the near vicinity to the development of micro-specialization and technology dependent systems of treatment at centralized and specialized centers. The demand side of the equation has also changed drastically in the past few decades. Medical treatment is rapidly becoming considered a right rather than a luxury for those who can afford it. Medicare and Medicade systems have been established in many countries and they are inevitable for the U.S. as well. Nurses and medical technologists are assuming important first contact roles. Paramedics are delivering emergency care in remote areas or to accident victims. Patients are screened and tested before they even see a doctor. These and many other major trends have created an environment where telecommunications based medical systems will be of increasing importance in the next two decades.

Several types of computer and communications based services will become more utilized in the next two decades. These will be reviewed in the next few paragraphs. The next part of this section of the paper will review the growing experimentation with various forms of visual communications in the medical environment. These examinations should permit a greater understanding of the opportunities that will arise from the use of telecommunications based systems in the future.

Trends in Medical Technology

Multiphasic Screening

Multiphasic screening systems are first step, pre-diagnosis tests that permit the routine taking of medical history, cardiopulmonary, anthropometry, sensory function, and body fluid tests. These tests are taken and analyzed by computers before the patient even sees the doctor. A Bell Canada Delphi study of Medical Technology forecasted that these systems will be in widepread use (20 to 55% of most major hospitals and medical centers) in the next two decades. (26)

Computer Assisted Diagnosis

This is the next step beyond multiphasic screening. The computer can also assist in identifying potential medical problems and indicate areas for further analysis by the physician. This is not designed to replace the doctor but give

him an assist and make better use of his or her scarce time. The Bell Delphi indicated that this would be a significant force in the 1980's and 1990's.

Remote Physiological Monitoring

This takes place today in many hospitals in intensive care wards. It is expected to take place on a more widescale basis across many hospital functions. Certain types of patients will also be placed under this form of care in their homes or even in normal daily life. Frequency limitations will mean that most of this will take place over the telephone rather than via continuous radio contact.

Computerized Medical Library Systems

The use of computer based medical information systems is another important aid in both medical education and the delivery of health-care. These centralized systems will be accessed via normal terminals located in hospitals and other medical facilities. They are also currently available in voice form so that doctors can call central libraries and receive taped lessons on specific topics. The use of voice and video cassette systems will also help in the delivery of new medical knowledge or refresher courses on important subjects.

Visual Medical Communications Systems

There have been a number of ambitious experiments funded by the U.S. Department of Health, Education, and Welfare. These experiments were launched to test visual telecommunications in a number of medical environments with differing needs. There were three general hypotheses associated with the tests:

"1) this technology could facilitate the functional aggregation of dispersed health-care resources, permitting third-level resources (e.g., highly skilled specialists and expensive equipment) to be geographically centalized for efficiency and cost containment and first-level resources (e.g., general practitioners and neighborhood clinics) to be geographically decentralized to improve the accessibility of health-care;
2) this technology could "redistribute' health-care personnel from areas of abundance (high-income urban and suburban) to areas of scarcity (low-income urban and rural); and
3) visual telecommuncation could mitigate the depersonalization of the health-care system that might

otherwise accompany certain organizational changes already underway to decrease inefficency, reduce duplication, and control costs," (27)

The experiments tested a wide variety of visual technologies ranging from PICTUREPHONE through to interactive cable television, laser links, and private microwave links. The test beds are in urban, rural, and semi-rural areas. The systems were used in a variety of ways . They can be summarized in the following categories:

Consultation
This involved consulation between various professionals in the health-care delivery system, with or without the patient being present.

Supervision
This entails the direction of medical activities by a more skilled health worker over a lessor skilled one.

Direct Patient Care (Telemedicine)
This is the delivery of diagnosis and therapy services over the visual link-up

Administration and Management
This category includes activities ranging from staff meetings to lab tests.

Education and Training
Formal and informal delivery of educational services over the systems. (28)

The results of the various experiments and their importance for the design of future systems are outlined in the paper by Maxine Rockoff. The importance of these experiments is that the various concepts are being tested in real-life situations rather than in artificial environments. They are providing valuable data that will help in the design of larger scale operational systems.

The next two decades will see a significant increase in the use of telemedicine and medical telecommunications. The social pressures for equaltiy in access to medical care will make the use of many of these systems mandatory if the needs are to be met. The opportunites are great in scope just as will be the problems in bringing about the needed changes. The systems that receive widespread use will be integrated ones rather

than the fractionalized and functionalized ones that exist in today's environment. Maxine Rockoff summarized this well when she concluded:

> "Surely tomorrow's broad-band communications facilities will integrate audio, digital, and video communications, both person-to-person and person-to-computer. It is not improbable that the communications infrastructure of tomorrow will in part determine the structure of tomorrow's health-care delivery system because of its information-intensive character." (29)

Future International Impacts of Telecommunications

Telecommunications systems have had and will continue to have a significant impact on the international system. International telephone traffic has one of the highest growth rates in the telecommunications field. The development of communications satellites has led to worldwide television becoming an accepted part of daily life in less than a decade. Satellites are beginning to fulfill some of their promise for education through the use of interactive and one way broadcasts to remote Alaskan villages, throughout the Indian sub-continent, and into desolate areas of the U.S. midwest. All of these types of developments can be expected to grow in the next two decades to impacts of major importance. These developments are also well known and will not be discussed in any further detail in this paper. Rather, a more unknown, but important development will be examined. This is the impact that may develop as a result of the use of international computer networks and computer conferencing systems. These systems will augment the existing voice and video telecommunications networks in the next two decades and may have profound international implications . Some of these are reviewed below.

Technology Transfer

Sharing of scientific and technical information on an international scale has been one of the principle topics of discussion in international trade and foreign aid research. The main philosophy of technology transfer is summarized in the old parable that it is much better to teach a man to fish than to give him a fish to eat. The transfer of knowledge or technology can take place on a formal basis such as the licensing of patents or on an informal basis such as the presentation of technical papers at various conferences. Multinational corporations or organizations are often the agents of technology transfer.

Computer conferencing is a potential tool for technology transfer on an international scale. It can act as a form of electronic publishing and electronic mail to transfer technological information between countries.

International Collaboration

The capabilities of computer conferencing for joint authorship and information dissemination have been utilized on a national basis. This has a special importance on an international scale, particularly for scientists in the Lesser Developed

Countries. In many cases the leading scientists in Lessor Developed Countries leave their home countries in order to carry on research with their peers in the industrial countries. This often occurs not for greater personal renumeration or better physical facilities, but from a desire to work with the leading researchers in the field in question. It is a need to be a recognized contributor member of the "invisible college" and to have access to the latest data on the topic.

Access to a computer conferencing network which had an on-going series of conferences on the scientist's areas of interest would enable him to become a member of the invisible college without leaving his home country. This would be of benefit to the scientist and his country while still permitting him access to the information he needs to conduct his research on a professional manner. It also enables the researcher to obtain the necessary ego reinforcement from his peers without physically joining them at a foreign location. One example of a computer conference based upon international collaboration is an energy modelling project currently underway. The chairman of this project resides in Japan; however, he wants to develop a model of world energy problems utilizing experts in North America and Europe. He is using a modified computer conference system available on an international time-sharing network. This system will permit joint collaboration on defining inputs to the model as well as the development of the model itself. This form of international cooperation would likely be impossible or too time consuming using normal forms of communications or face-to-face contact.

International Policy Determination

The utility of computer conferencing for national crisis management has been tested sucessfully. These benefits exist on an international basis as well. The value is for more than short term crises. A recent paperby Kupperman and Wilcox of the U.S. Arms Control and Disarmament Agency discussed how computer conferencing could be used in international negotiations. The use of a technique such as computer conferencing for international policy determination and conflict resolution certainly makes the technique a valuable addition to the family of communications services. The authors note the significance of this in their conclusions:

"..., it is clear that computer conferencing can assist materially in preventing international conflict and

resolving differences among nations. By contributing to understanding between nations with different value systems, computer conferencing can assist the participants in perceiving each other's interests and intents correctly, and in generating valuable statements of principle. Coupling traditional techniques of analysis with computer conferencing methods can thus form the basis of a common meta-language to bring international agreements to a new level of clarity, based upon a single image of evolving 'reality' which each side has helped to generate. Surely there can be no finer application of computer conferencing than to the deterrence of war and improved understanding among nations." (30)

Rome Futures Conference.

Computer conferencing received unique recognition at the Special Rome Conference on Futures Research in October 1973. This Conference was attended by individuals from both the industrialized world and the Lesser Developed Countries. It was directed towards establishing linkages between worldwide human needs, new societies, and the required supportive technologies. The conference was a week long dialogue on various issues, including the need for continuing communications on these topics between the various world futurists researching future problem areas and potential solution sets. At the end of the week, the 160 participants were asked to vote on 15 proposals developed by working groups. The voting weighed both the "importance" and "practicability" of these proposals. The communications group proposed the establishement of a futures oriented international computer conferencing network:

"At present remotely located groups are unable to confer with each other on vital common issues, eg., villages on farming plans, futurists on world population growth. A task force should undertake the development of a multi-media network which includes progressively cassettes, videotapes, and ultimately a two way real time interactive, computer augmented conferencing network available to all groups in the world interested in the study of problems of the future on a continuous, ie. when wanted basis. The appropriate sponsor is the World Federation of Futures Studies with UN and/or Foundation support. Full time professionals would be required. The project should begin as soon as possible so that international operation would be affected within four years.

> As demonstrated by the conference, communications are not working as well as they should be; remotely located potential participants are absent and communications between successive meetings have been lacking. There are many uses for the same network. The technology is available today and analogous networks are now operating, eg., a worldwide weather reporting system is available to all airports and used in all countries since the 1960's. The proposed concept can in fact use existing networks in many areas at a cost of $10 per hour or less". (31)

The assessment of the conference participants indicated that these futurists felt that the computer conferencing proposal was of the highest importance and practicability. It was tied with the proposal for the development of a "new human rights framework" as the most desirable of the 15 proposals presented at the conference. It is significant that a group of non-communications specialists meeting on a topic as broad as world problems picked computer conferencing as one of the most important tools for futures research and planning to assist solving major world problems. The beneficial capabilities offered by computer conferencing appear to be recognizable by a broad range of individuals after the concept is adequately explained.

Village Systems

Murray Turoff has proposed that computer conferencing could be used in lesser developed countries for a wide number of routine activities in remote villages. He argues that computer conferencing systems based upon mini-computers could be made available for the equivalent price of a cheap truck. These systems could be used for a series of village applications:

> Bid and barter conferences for various commodities both within the village and between villages.
>
> Regional and local planning activities. Village members could participate in decisions that would have an immediate impact upon them ie. road building, public construction, etc.
>
> Crop planning and agricultural data exchange.
>
> Access to remote experts and specialists who could help solve local problems remotely. These specialists could, for example, aid village paramedics or teachers.

Government information exchange. The system can be used by government officials to distribute information to local leaders and obtain feedback from them.

personal message transfer between villagers. (32)

One of the Nigerian speakers at the IFIPS and ICCC Stockholm conferences provided a supporting analysis. (33) He noted that many underdeveloped countries are currently planning and installing their first nationwide telephone systems. It would be shortsighted for their planners to merely duplicate the systems available in the industrial nations. Existing telephone systems have been designed for voice communications and only used after the fact for computer communications. The speaker argued that the Lesser Developed Countries should design their new communications systems with computer communications applications also in mind. (34) If this philosophy is followed we may see the eventual development of new national communications systems which include computer conferencing features as a part of the overall communications service package.

International Applications: Summary

Computer conferencing shows promise of becoming a valuable communications tool on an international basis. It will be of value for both inter and intra organizational communications as well as serving a variety of needs in the developing countries. In this review of future opportunities for telecommunications over the next two decades this ranks as a rarely discussed but important "comer" to consider.

Conclusions: Some Negative Issues

The issues reviewed in the above four sections illustrate some of the benefical opportunities that may emerge in the new two decades as a result of the wise use of telecommunications. This paper does not assume that this is a clear or easy future. However, it rests on the basic assumption that the problem areas can and will be overcome. It is not the purpose of the paper to examine these issues in any detail. However, several of the most important areas of concern will be briefly highlighted in order to provide some small balance of the pros and cons of the issue. Several of the most important areas are listed below:

Privacy

The adoption of telecommunications dependance as a significant conscious choice in many sectors of society will bring us face-to-face with many of the privacy and security issues that have been troubling many observers for the past decade. Dependence on computer and communications services for so much of our social interaction is certain to bring about periodic lapses in personal and institutional privacy. These issues have been discussed extensively elsewhere and this paper will go no further than to indicate that they certainly have relevance to this issue.

Loss of Interpersonal Interaction

Many social scientists and thoughtful observers have pointed out that work activities have a very high level of social interaction content. People need to interact with others on a purely social level and work settings create the ability for this to happen. Reduction of intercity travel may cut back the range of interpersonal experiences that individuals have access to during their travel. Reduction of commuting patterns through the use of remote work centers or home work centers would also have a severe impact on interperson interaction. If remote work centers were common public utilities rather than dedicated to specific institutions (a likely scenario in order to reduce the cost overhead of these institutions) then the interpersonal bonds that develop may be based upon friendships of others who happen to use the same work center rather than work for the same employer. This could have significant impact on job mobility patterns and employee loyalty.

Sector Unemployment

Gradual substitution is the most likely scenario for the

future. However, if significant shifts occur in institutional or individual attitudes, energy availability, environmental awareness, or the cost/benefit trade-offs between travel and telecommunications then we could expect to see rises in the unemployment levels in the transportation sector. This is not a minor factor. The transportation unions are some of the strongest in North America and have a long history of fighting (successfully) technological or policy advances that they perceive as having a negative impact on their members. The telecommunications industry is far more automated than the transportation industry and a corresponding growth in employment in the former field would not likely follow cutbacks or reduce growth in transportation. The transportation industry also has a successful history of lobbying with the political sector of our society and we might expect to see attempts to make telecommunications use a political issue if the industry began to see it as a significant threat to present or future business growth.

Disruption Potential

Just as significant reliance on telecommunications creates a privacy problem, it also raises potential dangers of massive failure, sabotage, strike shut-downs, and breakdowns due to natural disasters. Systems will have to be designed in a fashion similar to the existing telephone network. This means considerable redundancy, distributed intelligence, human back-up and control override capabilities, and rapid recovery ability. There must also be the capability to eliminate the cascading disaster possibility which has caused major problems in the electrical industry. The potential dangers here certainly weigh heavily against a very centralized system.

Access Rights

The question of who will be allowed or will be able to afford access to the technology that can make all of the above forecasts possible has troubled many observers. The phrase "information rich and information poor" has come to symbolize this concern. It can be argued that substitution, especially for local transportation, will only result in the creation of further ghettos. The poor will be even more cut off from the affluent who will be able to work in electronic isolation from the underprivileged. If the urban substitution process was carried to its ultimate conclusion, large cities would have their economic structures cut out from underneath them. The commuters would cease to be a source of tax revenue and hence cut out a significant slice of city revenues. On the other

hand, many clerical and support jobs might move to the electronic work centers where the poor could not afford to commute, thus creating employment dislocations. The support industries of the city (restaurants, shops, service trades, etc.) would lose significant markets. This negative scenario postulates a drop in the revenue base of the city along with a great increase in the need for social support systems as the underprivileged see their employment opportunities shrink. (35) The scenario is quite likely never to occur. As noted above, there are many social and other reasons to expect employees to want to go to the central offices several days a week. In addition, we could expect to see government and business leaders take positive actions to avoid most of the severe impacts postulated above before events got out of hand. Nevertheless, the question of access to telecommunications systems and the social/political impact that would develop from their widespread use must not be treated lightly.

There are certainly other potential negative implications of the uses of telecommunications. This short list is merely presented to indicate the range of possibilities and an agenda for further readings. However, on the balance, the author feels that telecommunications offers great promise in the future to meet a wide range of societal needs as long as choices are made wisely and with the potential dangers always in mind. (37)

Footnotes

1. The references shown in the following footnotes may help guide those who wish to pursue an area further.

2. Further details on the activities of Bell Canada's Business Planning group may be found in: Lawrence H. Day, "Long Term Planning in Bell Canada", Long Range Planning, Vol. 6, No. 3, September 1973, and Lawrence H. Day, "The Corporate Role in Technology Assessment: A Case Example", First International Congress on Technology Assessment, The Hague, The Netherlands, 29 May 1973. Also in Technology Assessment, Vol. 2, No. 1. See also: Lawrence H. Day, "The Future of Computer and Communications Services", National Computer Conference Proceedings (Montdale, N.J., AFIPS Press, June 1973), page 730

3. Committee on Telecommunications, National Academy of Engineering, Telcommunications Research in the United States and Selected Foreign Countries: A Preliminary Survey (2 vols), N.T.I.S. Washington, D.C., June 1973.

4. Studies here with detailed descriptions include: Walter S. Baer, Interactive Television: Prospects of Two-Way Services on Cable (Santa Monica, Calif., Rand Corporation, November 1971); Paul Baran, Potential Market Demand for Two-Way Information Services to the Home (1970-90)(Menlo Park, Calif., Institute for the Future, R-26, December 1971); Michael T. Bedford, The Future of Communications Services in the Home (Montreal, Que., Business Planning, Bell Canada, November 1972; proprietary); Sloan Commission on Cable Communications, On the Cable: The Television of Abundance (New York, McGraw-Hill, 1971); Ralph Lee Smith, The Wired Nation (New York, Harper Colophon, 1972)

5. Papers that describe this system include: Alesch, D.J., Intergovernmental Communication in the New York-New Jersey-Connecticut Metropolitan Region, RAND Corp., Report R-977, Santa Monica, Calif., May 1972. Alesch, D.J., and G.C. Sumner, MRC's Method of Evaluation for the Metropolitan Council Telecommunications System, RAND Corp., Report R-1000, Santa Monica, May 1972. Bretz, R., L.A. Dougharty; Two-Way TV Teleconferencing for Government: The MRC-TV system.; R-1489-MRC; Rand; Santa Monica; April 1974.

6. Douglas C. Engelbart, Richard W. Watson, James C. Norton, "The Augmented Knowledge Workshop", National Computer Conference Proceedings (Montdale, N.J., AFIPS Press, June 1973), page 9

7. Members of the Business Planning group will be testing this concept in real life for the next year. The group has subscribed to an experimental system to be run by Engelbart's group and will test many of the work-from-home and information retrieval capabilities. This experience will be evaluated on a scientific basis to determine the positive and negative changes in group behaviour and output over the length of the experiment.

8. Two collections of papers that explain this concept in detail may be obtained from ARPA: Resource Sharing Computer Networks, Advanced Research Projects Agency, Department of Defence, Washington DC, 1972 (session presented at Spring Joint Computer Conference, Atlantic City, 7 May 1970); The ARPA Network, Advanced Research Projects Agency, Department of Defence, Washington DC, 1972 (session presented at Spring Joint Computer Conference, Atlantic City, 16 May 1972)

9. Further details on computer conferencing may be found in: Lawrence H. Day, "Computer Conferencing: An Overview", forthcoming in a National Science Foundation (U.S.) sponsored volume on the International Conference on Computer Communications (Stockholm, 1974), edited by Nathanial Macon, Washington, D.C.

10. This topic is reviewed in more detail in: Lawrence H. Day, "Factors Affecting Future Substitution of Communications for Travel", Joint National Meeting, Operations Research Society of America and The Institute of Management Sciences, San Juan, Puerto Rico, Oct., 1974.

11. This has been discussed by Reid in his report to the Sloan Commission on Cable Communications: Alex Reid, New Directions in Telecommunications Research, Communications Studies Group, Joint Unit for Planning Research (University College London and London School of Economics), London, June 1971, pages 4-6

12. James H. Kollen, "New Perspectives on the Travel/Communications Tradeoff, National Association of Educational Broadcasters Convention, Las Vegas, Nevada, November 18, 1974.

13. A recent survey by the OECD is the first attempt to gather this data on an international basis. It is unpublished for formal distribution at this date.

14. Michael Katsoulis, internal memorandum, Business Planning Group, Bell Canada, Montreal, Canada, April, 1974.

15. Michael Katsoulis, Energy Impacts of Passenger Transportation, Business Planning , Bell Canada, Montreal, Canada, April, 1974.

16. Peter C. Goldmark, "A Rural Approach to Saving Energy: Technology Could Help Ease Urban Congestion", New York Times, Nov. 12, 1973, p.12.

17. Loc. Cit.

18. Paul Polishuk, "Telecommunications and the Energy Crisis", Telecommunications, Feb. 1974, p. 23.

19. Roger Pye, Michael Tyler, and Brian Cartwright, "Travel or Telecommunicate? The Energy Considerations", Presented at: Exploring the Limits to Growth of Telecommunications--Energy and Materials, IEEE Washington Section and Technological Forecasting and Assessment Office, Feb. 20, 1974.

20. Ibid., p. 9.

21. Edward M. Dickson, Raymond Bowers, The Video Telephone: A New Era in Telcommunications, a preliminary technology assessment (Ithaca, N.Y., Cornell University, June, 1973), Chapters 10, 15

22. E.M. Van Vleck, "Substituting Telecommunications for Travel: Feasible or Desirable", IEEE National Telecommunications Conference, San Diego, Calif., 3-5 Dec., 1974, pp. 4-5.

23. Ibid., p.6.

24. Daniel Bell, The Coming of the Post-Industrial Society: A Venture in Social Forecasting, Basic Books, New York, N.Y.,1973, p.14.

25. Two recent efforts at this definition process were conferences sponsored in part by the Engineering Foundation and the U.S. Dept of Commerce: Alan McAdams and Madeline M. Henderson, Report of Conference on Making Service Industries More Productive Through Computers and Automation, National Bureau of Standards, NBSIR 74-515, Washington, D.C. June 1974 and a corresponding conference on Productivity Improvement in the Service Sector Through Information Transaction Technology, July 28 to Aug 2, 1974 (no report yet available).

26. ANNenberg School of Communications, Implementing Two Urban Telecommunications Experiments Designed to Deliver Municipal Services, (proposal to the National Science Foundation), University of Southern California, January 1975.

27. Frank J. Doyle and Daniel Z. Goodwill, An Exploration of the Future of Medical Technology, Business Planning Group, Bell Canada, Montreal, Canada, March 1971, p. 23.

28. Maxine L. Rockoff, "An Overview of Some Technological/ Heath-Care System Implications of Seven Exploratory Broad-Band Communications Experiments", IEEE Communications Society Transactions, January, 1975, p. 20.

29. Ibid., pp. 22-24.

30. Ibid., p. 29.

31. R.H. Kupperman and R.H.Wilcox, "Interactive Computer Communications Systems-New Tools for International Conflict Deterrence and Resolution", Proceedings of the Second International Conference on Computer Communications, Stockholm, Sweden, August 1974, p. 471. The authors have also prepared (with Harvey A. Smith) a paper on this subject that has been published in Science ("Crisis Management--Some Opportunities", Science, Vol. 187, Feb. 1975, pp. 404-410).

32. Harold A. Linstone, "The Working Groups: A Focus on Action"

in Human Futures: Needs-Societies-Technologies, Futures, IPC Science and Technology Press Limited, Guildford, Surrey, U.K., 1974, p. 163.

33. Murray Turoff, "Potential Applications of Computer Conferencing in Developing Countries", Proceedings of the Special Rome Conference on Futures Research, Istituto Ricerche Applicate Documentazione e Studi, Rome, Italy, 1974.

34. These were respectively: The International Federation of Information Processing Societies and International Conference on Computer Communications held in Stockholm, Sweden during August, 1974.

35. Remarks made at both the IFIPS and ICC 74 Conferences by J Fagbemi of Nigeria.

36. An extensive analysis of this type of scenario can be found in : Cetron, Marvin J. et al, An Analysis and Report on the Technology Assessment of Urban Telecommunications Research, Forecasting International, Report to HUD, Washington, D.C., Aug. 1973.

37. This paper has been prepared on the OFFICE-1 computer system operated by the Augmentation Research Center at the Stanford Research Institute (see footnotes 6-7). The Business Planning Group is supporting this work in an attempt to trial the SRI concepts in an industrial work environment.

FUTURE OPPORTUNITIES IN TELECOMMUNICATIONS

(J32647) 3-JUN-75 08:46;;;; Title: Author(s): Inez M. Mattiuz/IMM;
Distribution: /LHD([INFO-ONLY]) ; Sub-Collections: BELL-CANADA;
Clerk: IMM; Origin: < MATTIUZ, WFS.NLS;4, >, 16-MAY-75 16:02 IMM
;;;; ####;

DLS 3-JUN-75 11:18 32648

Workshop Utility Service procurment

Bob, please send me a file reference as soon as you have the quotes ready for the text workstations...buy everything but the Data Media...rent it for 6 months (or appropriate time frame based on delivery date to the end of the contract...18 Jan 76). We could hold on the Tektronix 4014 and hardcopy printer buys, but we have the money now. Thanks for your help.

DLS 3-JUN-75 11:18 32648

Workshop Utility Service procurment

I just returned from a meeting with procurement on the Workshop Utility Service contract. Several items of note. 1

The buyer has been changed. It was Col Kelly. It is now Clara Knnckerbocker, telephone the same 315-330-2824. Apparently Kelly is being promoted out of the job now that he is a Col. Clara seems a little more aggressive and could be an asset in the future. 1a

Their biggest concern seemed to be with the cost analysis done by SRI of the TYMSHARE subcontract. Specifically, they could not find adequate justification for: 1b

the increase in TYMSARE overhead from last contacract to this ....from 49% to 100%. 1b1

the increase of the monthly equipment rate from 6% to 9%. Apparently TYMSHARE is concerned that we might not hang in with the KA-10 long enough for them to write it off, so they are increasing the write-off rate to 9%. 1b2

I understand that Spencer Floyd will be on vacation for the next 2 weeks, which could slow things from your end. You might have to put some pressure on Dolan to keep things moving. 1c

Procurement seems willing to sign a contract soon with out completely satisfying themselves as to TYMSHARE's overhead, G&A and rental rates. The contract would be for 19 slots, with a clause "not to exceed xxx dollars so they could later determine TYMSHARE'S rates to their satisfaction. 1d

They will take no action of the terminal buy, until they get at least a letter quote from SRI. 1e

I talked with Watson, who felt that the LSI-11 graphics setup was at least a year away (as far as production for customers was concerned). We would like to experiment with graphics in the meantime. We do not intend to purchase large quantities of linprocessor graphics workstations. I feel that we would loose the investment in a few chips at most, since the Tektronix 4014 seems the most likely candidate for the LSI-11 graphics tube...at least now. I feel a buy is in our best interest, since the breakeven point is around 2 years between buy and rent. 1e1

NSA has a MIPR in here for $4800. It reads for "2 DNLS Line Processors to work with Data Media Elite 2500 terminals". The amount of money sent seems to indicate either that they have the terminals or that they misunderstand what the total workstation

costs. I will try to clear this up, but maybe you should also get in touch. In any event you can add 2 more line processors to your order. 1f

In a hand written note I made to myself from a telephone call from Al Sockowitz?, NAVCOSSACT, he said he wanted 2 DNLS workstations + a pair of 1200 baud modems. I have not received a funding document from them yet. I'll try to clarify this further from my end. If you want to contact him his number is 202-433-3548. 1g

Workshop Utility Service procurment

(J32648) 3-JUN-75 11:18;;;; Title: Author(s): Duane L. Stone/DLS;
Distribution: /JCN([ACTION]) RLL([ACTION]) JLM([INFO-ONLY])
ELF([INFO-ONLY]) ; Sub-Collections: RADC; Clerk: DLS;

DLS 3-JUN-75 13:30 32650

SRI Extension, reply to Larry's 3 June Sndmsg

Larry, could you check on the progress of the OA out of Gunter...Our guys still haven't received it here yet. Are there any intermediate stops?

DLS 3-JUN-75 13:30 32650

SRI Extension, reply to Larry's 3 June Sndmsg

My initial reactions to your comments on the SRI tasks for the next 9 months: 1

I agree that we should have a delivery schedule in the contract and asked Dick last week via telecon to supply delivery dates. These will be gross delivery dates, adequate for the contract delivery schedule. A more detailed milestone chart will be delivered 2 weeks after the contract starts, which should allow closer contract monitoring than the last go-around. He has just seen the RADC statement of work today and has not had time to respond to it yet. 1a

This effort is not the 200th buy of a standard off-the-shelf software package, even though half the money and the procurement route being used indicate such. In my judgement, Dick wants to deliver and make things work. He and his team have more years of effort invested in this technology than the rest of us put together, so it is in his best interst as well as ours that he deliver. In the final analysis, I believe it is his good faith that will assure delivery ASAP, not a contractual delivery schedule. 1a1

I agree with your requirement for the FE to handle the DEX Cassette recorders. I'm not sure what this means in terms of additional FE software. As DEX is now used with the TIP, everything goes through a terminal, so there should be little extra FE software. If you have a high-speed cassette tape input station, then the FE might have to understand its pecularities. 1b

A general capability to have an "absentee" user would be great. One could then set up a runfile or Process Branch and have it executed at a specified time. There are lot of less urgent jobs that could make better use of the off hour resources if this were a possibility. 1b1

It is my understanding that the process of installing and maintaining FE software on the PDP-11 machines will be accomplished remotely. Additional copies going to AFDSC or RADC should involve minimum additional manpower. Rather than put in a clause contingent on the arival of a PDP-11 at these sites, I would rather modify the contract later on if necessary. 1c

The LSI-11 was put in the SOW just to make it look more like we knew exactly what we were after. I can take it out, but think that it is the most likely implementation of the advanced graphics workstation in the next 9 months. 1d

In all our deliberations we should keep in mind the June 30 deadline. I have the procurement package ready to go into the

system and have greased all the skids that I am aware of, but we still haven't received the OA, which is necessary to start the official wheels moving. I will be finalizing the SOW and delivery schedule Thursday with the procurement, so would appreciate any last minute comments before then. 1e

DLS 3-JUN-75 13:30 32650

SRI Extension, reply to Larry's 3 June Sndmsg

(J32650) 3-JUN-75 13:30;;;; Title: Author(s): Duane L. Stone/DLS;
Distribution: /LAC([ACTION]) WEC([ACTION]) MAW([ACTION])
AAB([ACTION]) RWW([ACTION]) JLM([INFO-ONLY]) FJT([
INFO-ONLY]) ; Sub-Collections: RADC; Clerk: DLS;

PCB 3-JUN-75 15:03 32652

m

hi frank, got your messags. dave browns user code in nimp-group is db4. his current is jdb2 since you fixed it. other than that all ok.... regards to you and ila.....paul 1

m

(J32652) 3-JUN-75 15:03;;;; Title: Author(s): Paul C. Bishop/PCB;
Distribution: /FGB([ACTION]) JDB2([INFO-ONLY]) ;
Sub-Collections: NIC; Clerk: PCB;

JGN 3-JUN-75 16:15 32653

PROBLEM WITH ELF INFO

HAVE BEEN GOING OVER THE ELF INFO YOU TOLD US ABOUT LAST TIME. IT READS FUNNY. IT SEEMS THAT A WORD OR SO IS MISSING AT THE END OF EACH LINE. IT ADDS JUST ENOUGH NOISE IN THE TEXT SO THAT SOME PARTS OF THE MESSAGE AREN'T CLEAR. CAN THIS BE FIXED?? IF SO, PLEASE LET ME KNOW; IT IS OF INTEREST TO US HERE. TELL ME VIA NLS MAIL, OR SNDMSG TO NELC@ISI.

GIL GOT BACK TO ME WITH THE NAMES AND OTHER INFO ABOUT THE MINI PEOPLE. IT'S TOO MUCH TO TYPE IN; I'LL MAIL IT TO YOU USING THE U. S. SNAIL SERVICE.

THANKS, GREG

1

JGN 3-JUN-75 16:15 32653

PROBLEM WITH ELF INFO

(J32653) 3-JUN-75 16:15;;;; Title: Author(s): J. Gregory Noel/JGN;
Distribution: /FGB([ACTION]) ; Sub-Collections: NIC; Clerk: JGN;

1 Network Working Group David C. Walden
Request for Comments 687 (WALDEN@BBN)
NIC 32654 June 2, 1975 1

2 IMP/Host and Host/IMP Protocol Change 2

3 This note sketches the design of an expansion to the IMP/host and host/IMP protocol which will include among other things the possibility of addressing hosts on more than 63 IMPs. Our intention in this expansion is to correct certain existing limits without fundamental changes in the philosophy of the IMP/host protocol; i.e., while many issues which would represent fundamental changes to the IMP/host protocol are presently under discussion in the world-wide packet-switching community, we are not able to undertake massive fundamental changes on a time scale compatible with the short term needs for network improvement (e.g., already there are almost 60 IMPs). 3

4 The following paragraphs cover each of the major characteristics of the expanded protocol. A knowledge of Section 3 of BBN Report 1822 is assumed. As is discussed below, the expanded protocol is backwards compatible. 4

4a 1. Expanded Leader Size. The leader will be expanded from two to five 16-bit words. This will provide space for necessary field expansions and additions. 4a

4b 2. Expanded Address Field. The address field will be expanded to 24 bits, 16 bits of IMP address and 8 bits of host address. This expansion is more than adequate for any forseeable ARPA Network growth. 4b

4c 3. New Message Length Field. A new field will be added which will allow the source host to optionally specify the message length (in bits) to the IMP subnetwork. The IMP subnetwork may be able to use this information (when available) to better utilize network buffer storage. The destination host may also be able to use this information to better utilize its buffer storage. This field will be 13 bits wide. 4c

4d 4. Expanded Handling Type Field. The handling type field which now is used to distinguish between priority and non-priority message streams, etc., will be expanded to eight bits. This

expanded field will provide for the possibility of a number of parallel message streams having different handling characteristics between pairs of hosts; e.g., priority, non-priority, varying numbers of packets per message (see below), unordered messages (i.e., the present type-3 messages), a message stream requiring guaranteed capacity, etc. Note that only some of these facilities will be available in the near term. 4d

4e 5. Source Host Control of Packets per Message. The possibility will exist for the source host to specify a message stream which will use a given number of packets per multi-packet message (e.g, two packets per message or five packets per message). Since the IMP network will not have to use eight packet-buffers for reassembly purposes, as at present, this may result in better services for such messages. This will help users who need both low delay and high throughput. 4e

4f 6. Unordered (type-3) Message Change. Unordered messages will be indicated by a handling type rather than by a message type as at present. This is compatible with the need to check the host access control capabilities of all messages. This will provide a slight backward incompatibility for the three or so hosts which presently use type-3 messages in their research. 4f

4g 7. Change in Format of Fake Host Addresses. The For/From IMP bit will be eliminated. The fake host addresses will be the four highest host numbers (e.g., IMP Teletype will be host 252). 4g

4h 8. Addition of a Parameter to the IMP to Host NOP. The IMP to host NOP will have added to it a parameter specifying the address (IMP and host number) of the host. 4h

4i 9. Backward Compatibility. The old and new formats will be supported in parallel in the IMPs for the foreseeable future to allow gradual phaseover of host software. A host will be able to specify to its IMP whether the old or new formats are to be used; thus, it will be possible for the host to specify switching back and forth between the two modes for debugging purposes. The specification of the mode to be used will be possible via a proper choice of format in the host to IMP NOP message; the IMP will use the mode of the host to IMP NOP message the IMP has received. Further, a host may select to use either the old or new format without needing to know more about the other format

messages than to discard them should they arrive. The IMP will initialize by sending several NOP messages of each type to give the hosts its choice. Although a host not implementing the new format will not be able to address hosts on IMPs with IMP-number greater than 63, the IMPs will wherever possible do the conversion necessary to permit hosts using the old format to communicate with hosts using the new format and the reverse. Finally, it will be possible to convert the leader format from old to new or the reverse without knowledge of the message type. 4i

4j 11. Non-blocking Host Interface. A mechanism will be provided which allows the IMP to refuse a message from a host without blocking the host interface. This mechanism will permit the IMP to gather the necessary resources to send the refused message and then ask the host to resend the message. Finally, the host will be permitted to ask to be able to send a message and be notified when it is possible without requiring the message to actually be sent and refused. 4j

4k 12. Maximum Message Length. The maximum number of bits of data in a message may be reduced by a few bits. 4k

5 We are presently working out the details of an implementation plan for making the above changes to the IMP software. We will distribute an implementation schedule and other necessary information (e.g., format details) in plenty of time for hosts desiring to use the new protocol as soon as it is available to implement in time. 5

6 6

NWG/RFC# 687 DCW3 6-JUN-75 23:06 32654
IMP/Host and Host/IMP Protocol Change

(J32654) 6-JUN-75 23:06;;;; Title: Author(s): David C. Walden/DCW3; Distribution: /JBP([INFO-ONLY]) ; Sub-Collections: NWG NIC; RFC# 687; Clerk: JAKE; Origin: < POSTEL, RFC687.NLS;2, >, 7-JUN-75 00:24 JBP ;;;;####;

1 Network Working Group David C. Walden
Request for Comments 688 (WALDEN@BBN)
NIC 32655 June 4, 1975 1

2 Tentative Schedule for the New
TELNET Implementation for the TIP 2

3 Implementation of the New TELNET Protocol has now become the top priority item on the TIP development queue. Because what is done in the TIP potentially affects what is done at a number of hosts, below we give the implementation schedule to which we hope to adhere. 3

4 - July 18, 1975 -- Done with the basic design. A version of the TIP which has a general version of the option negotiator, but refuses all options, operational. 4

5 - Mid-September, 1975 -- Design of the options done. A version of the TIP which includes any modifications that are necessary to support the options operational. 5

6 - Mid-November -- Operational version of the TIP with the basic set of options implemented (Binary Transmission, Echo, Suppress Go-Ahead, Timing Mark, RCTE). 6

7 - End of 1975 -- Any problems with hosts worked out, any necessary revisions done, and a solid version of the TIP up and running the new TELNET Protocol with options. 7

NWG/RFC# 688 AAM 6-JUN-75 23:08 32655
Schedule for new Telnet on the TIP

(J32655) 6-JUN-75 23:08;;;; Title: Author(s): Alex A. McKenzie/AAM; Distribution: /JBP([INFO-ONLY]) ; Sub-Collections: NWG NIC; RFC# 688; Clerk: JAKE; Origin: < POSTEL, RFC688.NLS;2, >, 7-JUN-75 00:32 JBP ;;;;####;