

Reply to (18274,1)--Sort of

Ric: I got your Journal message (document) (18274,1) when I returned from lunch today. I'll read it later and let you know what I see. Thanks, it worked.

1

Reply to (18274,1)--Sort of

(J18287) 7-AUG-73 13:40; Title: Author(s): James C. Norton/JCN;  
Distribution: /RLT; Sub-Collections: SRI-ARC; Clerk: JCN;

lost file

we here at RADC have inadvertantly lost a file. presumably someone deleted it erroneously assuming that it had been archived. the file is <mcnamara>ft. I used the exec's interrogate command and found to my utter amazement that it worked. a few minutes later the file came on line. unfortunately for the good guys... some unknown idiot had created two versions or rather two files with the same name. one in 1972 and the other in july 1973. is it possible to get the 1973 version? the one that was retrieved , naturally was the 1972. we'll get the hang of this thing yet. could you advise asap, or one little girl is going to be doing a lot of typing in a real hurry. how are you feeling?(dvn)i

1

lost file

(J18288) 7-AUG-73 15:07; Title: Author(s): Edmund J. Kennedy/EJK;  
Distribution: /DVN JLM DLS; Sub-Collections: RADC; Clerk: EJK;

## Status and problems - Line Processor Development

Here are some notes about status and problems encountered at this stage of development of the Line Processor. Suggestions and general feedback are requested.

1

The protocol for interactions between the Line Processor and the main computer are outlined in (andrews,mcs4,2:yg).

1a

The mouse will be tracked at all times except when the user program (NLS) is writing a string to recreate the text display area. Broadcast messages will go into a TTY window, except when they come intermixed with one of these strings. We don't anticipate a problem here, but it may happen occasionally. The result would be a very messed up display text area. A F viewspec would restore it.

1b

If the user does a ↑C, interactions will take place in the "small" (probably 4 lines) TTY scrolling window. A problem occurs here if the ↑C interrupts the transmission of a string from NLS: Namely, when he continues, the remainder of the string will come up in the TTY window. We don't expect a problem here either. There are ugly ways around this if it is a big problem.

1c

The "clear remainder of line" function will be implemented in the protocol in such a way that it can be done on a display that does not have such a function. A character count (N) will be passed to the Line Processor, which will send N blanks if the display doesn't have the clear line function.

1d

We should be able to make the line processor work with a variety of dispys by changing one or two memory chips, or perhaps adding a memory chip.

1d1

The entire literal input echoing operation will be carried out by NLS without the aid of special commands to the line processor. This saves Line Processor memory. It also prohibits doing any kind of local literal echoing in this type of Line Processor.

1e

We will probably not implement the cursor linking in this type of Line Processor. In fact, display linking is a serious problem, unless the other terminal is also a line processor. Like how do we map the current display protocol into the line processor protocol? It would have to take place inside NLS and perhaps involve two display creations.

1f

The hardware will have an AUX output port, into which the user can plug a hardcopy device, such as a TI or other printer. The idea is to provide a hardcopy channel in parallel with normal operation on the display terminal. What is the best way to achieve this?

1g

## Status and problems - Line Processor Development

A simple protocol could get the characters out to the line processor, provided it either involved a handshake on each bundle of characters, or went out at the baud rate which the hardcopy device was set for. The line processor would probably be able to buffer only 8 or so characters.

1g1

The most attractive way to handle it in the TEN would be to have a background process passing characters down the line from a file in some directory - similar to the current printer spooler. That way a user could do a COPY, QUICKPRINT, etc. and then continue with whatever he wanted while he worked.

1g2

Associated problems are: how do we keep two independent processes writing into the same output buffer from messing up each others command sequences? ...

1g3

The protocol to the line processor only includes line editing. If NLS is ever educated to do character manipulation in display updating, it will have to find a smarter line processor to talk to. If somebody really thinks this is a mistake, screem. The primary reason to leave this out is memory usage and the fact that many displays do not have character editing anyway.

1h

In all TTY simulation, the line processor expects the TEN to break lines - i.e. it does not expect characters to go running off the end of the line. But what it does in that case is to start over on the same line, covering up what was there before. An alternate solution to this is to just keep typing in the last character position. The line processor should not break the line itself because 1) it takes time and data would be lost, 2) it would mess up another display area in the case of a "small" TTY simulation window.

1i

Status and problems - Line Processor Development

(J18289) 7-AUG-73 15:37; Title: Author(s): Don I. Andrews/DIA;  
Distribution: /CHI DSK KEV MEH RWW DCW; Sub-Collections: SRI-ARC; Clerk:  
DIA;  
Origin: <ANDREWS>NOTES.NLS;3, 7-AUG-73 15:28 DIA ;

Minutes of the Documentation Instigation and Review Team  
7-JULY-1973

On August 7, at 1:00 the Documentation Instigation and Review Team held a meeting to discuss scheduling, syntax, and style for documenting the new Command Language. Attending were Jeanne Beck, Dean Meyer, Kirk Kelley and Dirk vanNouhuys who called the meeting.

1

DVN said that he would do work on the documentation assigned to KIRK while KIRK is on vacation.

2

Current Status Of Userguides.

3

Different sections were assigned to JNB, NDM, and KIRK to incorporate what new changes to the current language were documented in Folklore and Doc1. These updates are substantially complete. In addition, NDM has almost completed a summary of the new editing command syntax and conventions which are contained in <meyer, commands,>. Also, a document explaining the new syntax is in <meyer,comlang,>.

3a

It was decided that knowledge of which recognition scheme to be used for the Novice Mode would be necessary to specify syntax and that the Novice-Expert committee should be pushed to inform DIRT of their decision.

4

DVN described the HELP QUERY features in <18222,> and as described to him by Dianne Kaye and Harvey Lehtman. File structure was discussed with respect to Mike Kudlick's description in <kudlick, helpsys,>. Two basic databases seem necessary.

5

COMMANDS would contain each command with three alternatives in substructure:

5a

COMMAND

5a1

SYNTAX

5a1a

EXAMPLE

5a1b

FUNCTION

5a1c

CONCEPTS would contain a short description of the comments as described in <kudlick, helpsys, 6a2>.

5b

The statement names of options must be less than 18 characters.

6

It was decided that links using SID's to a single file containing syntax for each command would be under SYNTAX in the COMMANDS database instead of actual syntax.

7



Minutes of the Documentation Instigation and Review Team  
7-JULY-1973

The concepts and corresponding commands were divided among the committee members as follows:

JMB

Concepts

TEXTENTITIES

CM

LEVADJUST

DAE

READING

STRUCTURE

VIEWSPECS

LINKS

OPTIONS

DSEL

SSEL

etc.

EDITING

Commands

jump

load file

delete marker

mark

renumber SID's

set/reset name delimiters

show name delimiters

freeze, unfreeze statement

reset/set link default

set/reset case mode

transpose

append

break

copy

delete

edit statement

insert text or structural entity

insert directory

sort merge

move replace

substitute

linefeed key

tab key

8

8a

8a1

8a1a

8a1a1

8a1b

8a2

Minutes of the Documentation Instigation and Review Team  
7-JULY-1973

†  
.  
/

	8a2a
NDM	8b
USER PROGRAMMING	8b1
compile	
output assembler	
record	
terminate	
playback	
set/reset filter	
set/reset DDT	8b1a
SYNTAX	8b2
FILE ACCESS, HANDLING NAMES, PARTIAL COPIES	8b3
create file	
delete file	
delete modivications	
expunge	
restore	
move file	
insert sequential	
protect	
set/reset archive	
set/reset temp. mod.	
show (except name delims)	
trim	
update	
verify	8b3a
COMMANDS	8b4
RECOGNITION	
VERB-NOUN	
SUBSYSTEMS	
CONFIRM	8b4a
set/reset terse	
set/reset verbose	
execute	
goto	
quit	8b4b

Minutes of the Documentation Instigation and Review Team  
7-JULY-1973

FORMATTING

8b5

- OUTPUT
- PRINT
- Output [ devices ]
- remote
- terminal

8b5a

KIRK

8c

- NIC
- NLS
- HELP
- GLOSSARY
- NOVICE
- JOURNAL
- IDENT
- NUMBER
- TERMINALS
- Logout, Login
- Upper-lower case
- Simulate terminal

8c1

Dirk asked everyone to think about the best concept list within the limitations of 24 top level concept alternative words.

9

The next meeting was set for Wednesday August 8 12:15.

10

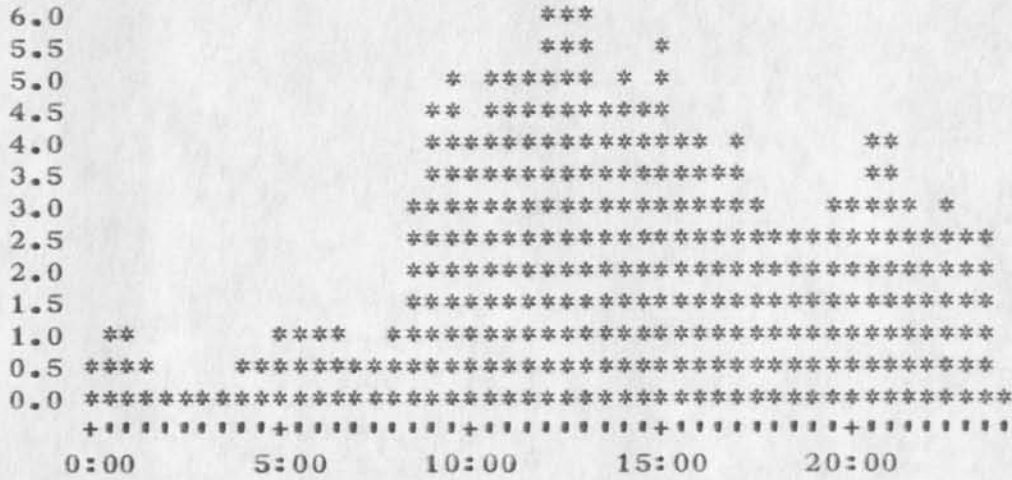
Minutes of the Documentation Instigation and Review Team  
7-JULY-1973

(J18294) 7-AUG-73 17:47; Title: Author(s): Documentation Instigation  
and Review Team /EDIRT; Distribution: /DIRT NDM JMB; Sub-Collections:  
DIRT; Clerk: KIRK;  
Origin: <KELLEY>DIRT.NLS;4, 7-AUG-73 17:29 KIRK ;

Superwatch Average Graphs for Week of 7/30/73

TIME PLOT OF AVERAGE NUMBER OF GO JOBS FOR WEEK OF 7/30/73  
x axis labeled in units of hr:min, xunit = 30 minutes

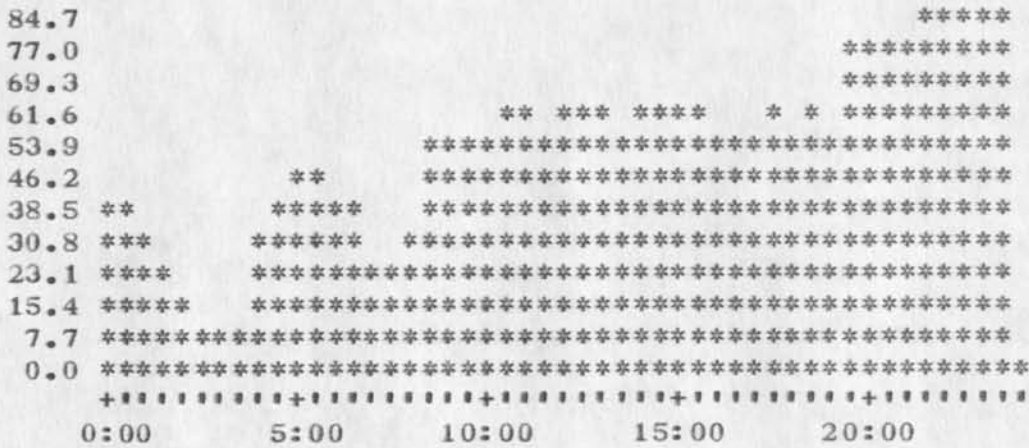
1



1a

TIME PLOT OF AVERAGE PER CENT OF CPU TIME CHARGED TO USER ACCOUNTS  
FOR WEEK OF 7/30/73  
x axis labeled in units of hr:min, xunit = 30 minutes

2



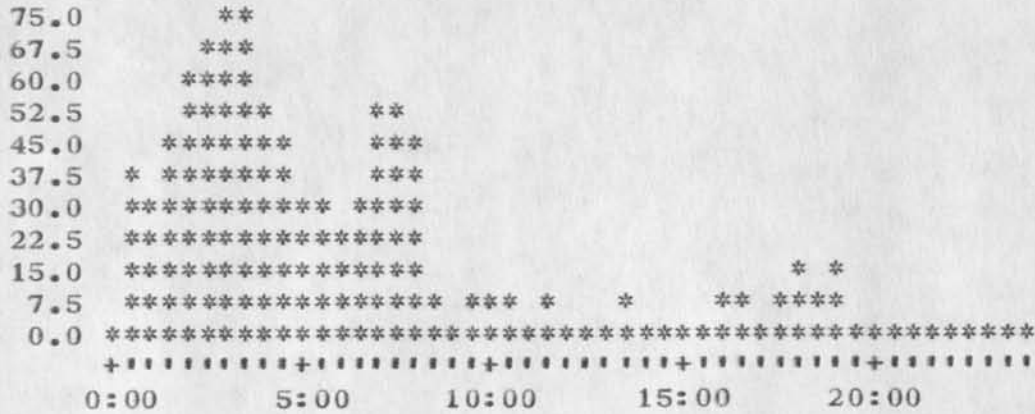
2a

Superwatch Average Graphs for Week of 7/30/73

TIME PLOT OF AVERAGE IDLE TIME FOR WEEK OF 7/30/73

x axis labeled in units of hr:min, xunit = 30 minutes

3

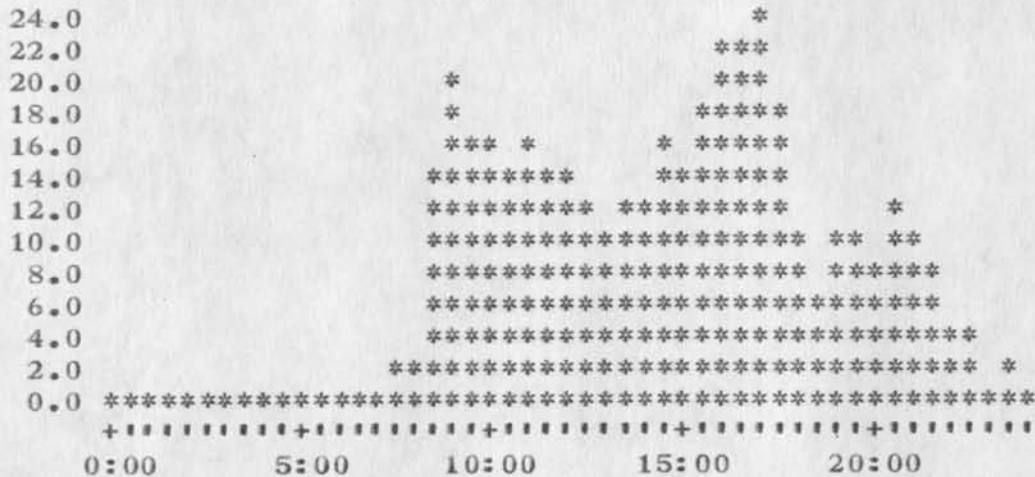


3a

TIME PLOT OF AVERAGE PER CENT OF SYSTEM USED IN DNLS FOR WEEK OF 7/30/73

x axis labeled in units of hr:min, xunit = 30 minutes

4

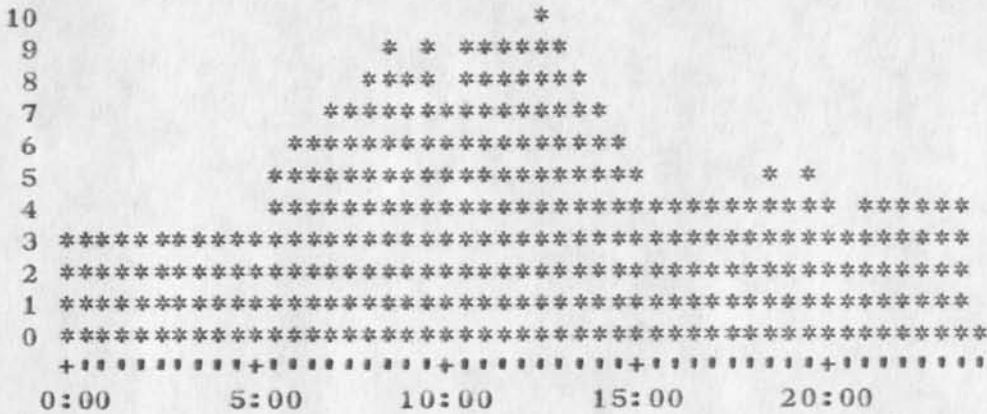


4a

Superwatch Average Graphs for Week of 7/30/73

TIME PLOT OF AVERAGE NUMBER OF NETWORK USERS FOR WEEK OF 7/30/73  
x axis labeled in units of hr:min, xunit = 30 minutes

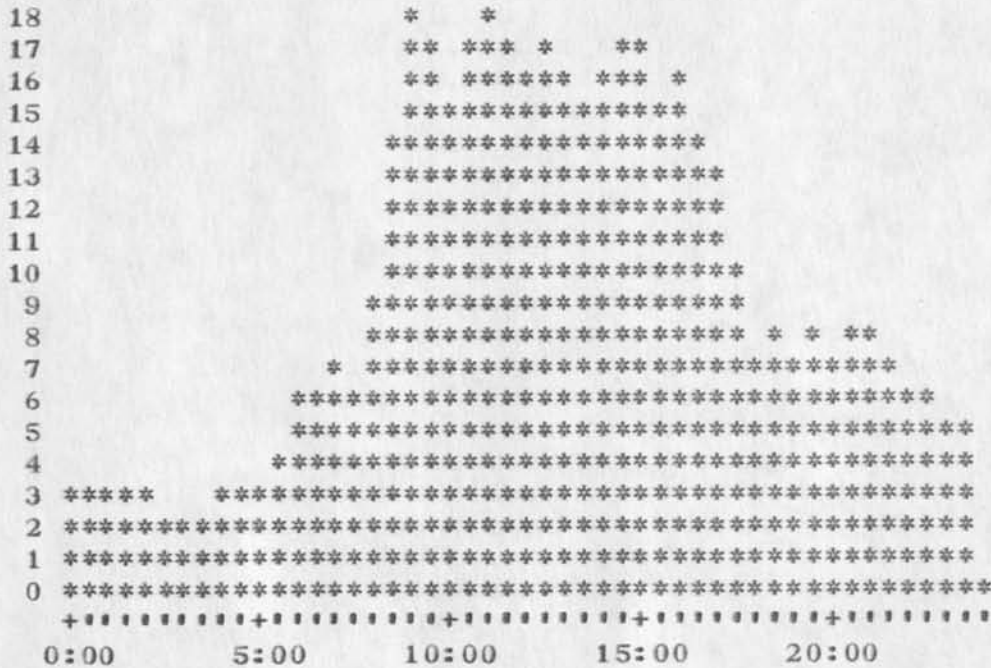
5



5a

TIME PLOT OF AVERAGE NUMBER OF USERS FOR WEEK OF 7/30/73  
x axis labeled in units of hr:min, xunit = 30 minutes

6



6a

Superwatch Average Graphs for Week of 7/30/73

(J18310) 7-AUG-73 20:38; Title: Author(s): Susan R. Lee/SRL;  
Distribution: /JCN RWW DCE PR DCW JCP DVN JAKE CFD KIRK DLS BAH;  
Sub-Collections: SRI-ARC; Clerk: SRL;  
Origin: <LEE>WEEK7/30GRAPHS.NLS;2, 7-AUG-73 17:08 SRL ;



Publications

Dick, I agree with your memo on publication (MJOURNAL, 18227, 1:w) and would like to present a paper at the NCC conference in the Spring on query language per our conversation of several months ago (March I believe). This would be a collaborative effort with Mike and Harvey I would presume, but I would like to take the responsibility for writing it if this meets with your approval. ....Jake

1

Publications

(J18311) 7-AUG-73 22:00; Title: Author(s): Elizabeth J. (Jake)  
Feinler/JAKE; Distribution: /RWW; Sub-Collections: SRI-ARC; Clerk: JAKE;

July Arpanews  
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Jeanne--

Thanks for the very explicit pointer to the latest issue. Things seem to be quite cleared up now, and I'm sorry if any feelings were hurt in the process. --Nancy  
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18312 Distribution  
Jeanne B. North,

July Arpanews  
- - - -

(J18312) 8-AUG-73 07:08; Title: Author(s): Nancy J. Neigus/NJN ;  
Distribution: /JBN ; Sub-Collections: NIC; Clerk: NJN; .SNF=HIRM;

## My Thoughts on Publication-- Reply to RWW (18227,)

I agree wholeheartedly with RWW's memo on publication (18227,). I have felt in the past that many of the innovative ideas and systems implemented here deserved wider recognition. (Within the past three issues of the ACM Communications there have been discussions of WILBUR and a COM text processing system for the American Physics Society.)

1

We continue to publish approximately the same annual report each year. It tends to be filled with ARC jargon and also tends to obscure any purely technical advances.

1a

The following warnings, however, should be observed:

2

There are parts of our system which are neither unique nor particularly special; there are also parts of our system which are just embarrassing. It would not be advantageous to write articles on these parts of the system.

2a

In the course of our experimentation, some good systems are unsuccessful for various reasons. In the past, they have been dropped and ignored; it may prove valuable to document these efforts and try to analyze their lack of success.

2b

Publication often entails requests for source code. Some of our code is still in bad shape. It would pay to clean up code before/during publication.

2c

We have a habit in our publications of ignoring and not acknowledging the work of others outside of our group. While we may get away with that in some publications, most scientific and technical journals simply would not permit it. We will be forced to do more general research in the field to see what has been done before. This cannot help but improve our internal development by forcing us to strive for something better.

2d

Given the tight programming schedule for the utility and MPS conversion, I am not sure how much writing can reasonably be expected from the programming group in the next six months. In particular, the NCC deadlines couldn't come at worse times (October and November.)

2e

Given those caveats, I still look forward to collaborating on articles on parts of the system in the next year.

3

18313 Distribution

Jeanne M. Leavitt, Rodney A. Bondurant, Jeanne M. Beck, Mark Alexander Beach, Judy D. Cooke, Marcia Lynn Keeney, Carol B. Guilbault, Susan R. Lee, Elizabeth K. Michael, Charles F. Dornbush, Elizabeth J. (Jake) Feinler, Kirk E. Kelley, N. Dean Meyer, James E. (Jim) White, Diane S. Kaye, Paul Rech, Michael D. Kudlick, Ferg R. Ferguson, Douglas C. Engelbart, Beauregard A. Hardeman, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Mil E. Jernigan, Harvey G. Lehtman, Jeanne B. North, James C. Norton, Jeffrey C. Peters, Jake Ratliff, Edwin K. Van De Riet, Dirk H. Van Nouhuys, Kenneth E. (Ken) Victor, Donald C. (Smokey) Wallace, Richard W. Watson, Don I. Andrews

My Thoughts on Publication-- Reply to RWW (18227,)

(J18313) 8-AUG-73 08:54; Title: Author(s): Harvey G. Lehtman/HGL;  
Distribution: /SRI-ARC; Sub-Collections: SRI-ARC; Clerk: HGL;



ILLIAC FORTRAN MEETING Next Week

Massachusetts Computer Associates (COMPASS) has announced an ILLIAC FORTRAN meeting on August 14 and 15. (See ARPANET NEWS Update <NIC>ARPANEWSJULY)

ILLIAC FORTRAN MEETING Next Week

(J18314) 8-AUG-73 09:27; Title: Author(s): Jeanne B. North/JBN;  
Distribution: /NLG NAG NSAG PI NIC; Sub-Collections: NIC NLG NAG NSAG  
PI; Clerk: JBN;

JUL 22-28, 1973: A WEEK IN REVIEW

WEEKLY ANALYSIS REPORT:

WEEK: JUL 22 - 28, 1973 (24 HOURS/DAY)

TOTAL SYSTEM CPU: 77.286

(ARC)

IDENT	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1
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(STAFF)

(JMB)	.482	17.128	.028	.624	35.535
(DCE)	.448	13.301	.034	.580	29.690
(SRL)	.159	5.580	.028	.206	35.094
(NDM)	1.517	35.646	.043	1.963	23.498
(JCN)	.969	15.856	.061	1.254	16.363
(DVN)	-	-	-	-	-
(PR)	.332	11.540	.029	.430	34.759
(RWW)	.156	4.972	.031	.202	31.872
	-----	-----		-----	
(TOTAL)	3.581	86.895		4.635	

(PSO)

(KFB)	.117	9.965	.012	.151	85.171
(BAH)	3.179	29.374	.108	4.113	9.240
(MEJ)	.924	69.798	.013	1.196	75.539

## JUL 22-28, 1973: A WEEK IN REVIEW

(KIRK)	1.378	34.682	.040	1.783	25.168	6a4d
	-----	-----		-----		6a4e
(TOTAL)	5.598	143.819		7.243		6a4f
						6a4g
(NIC)						6a5
(JDC)	.005	.128	.039	.006	25.600	6a5a
(EJF)	.156	7.995	.020	.202	51.250	6a5b
(CBG)	.002	.026	.077	.003	13.000	6a5c
(MDK)	.537	11.845	.045	.695	22.058	6a5d
(MLK)	.528	16.771	.031	.683	31.763	6a5e
(JBN)	8.053	38.864	.207	10.420	4.826	6a5f
	-----	-----		-----		6a5g
(TOTAL)	9.281	75.629		11.801		6a5h
						6a5i
(HARDWARE)						6a6
(MEH)	.018	.738	.024	.023	41.000	6a6a
(JR)	.002	.287	.007	.003	143.500	6a6b
(EKV)	-	-	-	-	-	6a6c
	-----	-----		-----		6a6d
(TOTAL)	.020	1.025		.026		6a6e
						6a6f
(TENEX)						6a7
(DIA)	1.307	22.688	.058	1.691	17.359	6a7a
** (WRF)	.188	5.506	.034	.243	29.287	6a7b
(KEV)	.047	1.439	.033	.061	30.617	6a7c

## JUL 22-28, 1973: A WEEK IN REVIEW

(DCW)	-	-	-	-	-	6a7d
	-----	-----		-----		6a7e
(TOTAL)	1.542	29.633		1.995		6a7f
						6a7g
(NLS)						6a8
(CFD)	.491	12.424	.040	.635	25.303	6a8a
(JDH)	.152	6.663	.023	.197	43.836	6a8b
(CHI)	.587	11.265	.052	.760	19.191	6a8c
(DSK)	.858	17.441	.049	1.110	20.328	6a8d
(HGL)	.530	12.123	.044	.686	22.874	6a8e
(EKM)	.403	18.276	.022	.521	45.350	6a8f
(JEW)	.374	16.139	.023	.484	43.152	6a8g
	-----	-----		-----		6a8h
(TOTAL)	3.395	94.331		4.393		6a8i
						6a8j
(GROUP) TOTALS						6b
GROUP	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU	6b1
						6b2
(STAFF)	3.581	86.895	.041	4.633	24.266	6b3
(PSO)	5.598	143.819	.039	7.243	25.691	6b4
(NIC)	9.281	75.890	.122	12.009	8.177	6b5
(HARDWARE)	.020	.287	.070	.026	14.350	6b6
(TENEX)	1.542	29.633	.052	1.995	19.217	6b7
(NLS)	3.395	94.331	.036	4.393	27.785	6b8
	-----	-----		-----		6b9

## JUL 22-28, 1973: A WEEK IN REVIEW

(TOT)	23.417	430.855		30.299			6b10
							6b11
(STATS)							6c
HIGHEST CPU:	JBN	8.053 hrs	LOWEST CPU:	CBG JR	.007 hrs		6c1
HIGHEST CON:	MEJ	69.798 hrs	LOWEST CON:	JDC	.128 hrs		6c2
HIGHEST CPU/CON:	JBN	.207	HIGHEST CON/CPU:1:	JR	143		6c3
							6c4
(OVERHEAD)							6d
(JCP)	1.459	44.337	.033	1.888	30.389		6d1
BACKGROUND	2.008	89.541	.022	2.598	44.592		6d2
CAT	22.132	65.816	.336	28.636	2.974		6d3
DOCB	.011	1.867	.006	.014	169.727		6d4
DOCUMENTATION	.369	9.121	.040	.477	24.718		6d5
GILBERT	-	-	-	-	-		6d6
NETINFO	.382	13.551	.028	.494	35.474		6d7
NIC-WORK	-	-	-	-	-		6d8
OPERATOR	1.387	9.539	.145	1.795	6.877		6d9
PRINTER	5.257	89.547	.059	6.802	17.034		6d10
SYSTEM	12.954	265.733	.049	16.761	20.514		6d11
USERGUIDES	.001	.006	.167	.001	6.000		6d12
	-----	-----		-----			6d13
(TOTAL)	45.960	589.058		59.466			6d14
							6d15
(XEROX)							6e
							6e1

## JUL 22-28, 1973: A WEEK IN REVIEW

NAME	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1	
(LPD)DEUTSCH	.128	3.437	.037	.166	26.852	6e2
(CMG)GESCHKE	-	-	-	-	-	6e3
(JGM)MITCHELL	.036	3.076	.012	.047	85.444	6e4
(WHP)PAXTON	-	-	-	-	-	6e5
(EHS)SAT-WTE	.235	6.476	.036	.304	27.557	6e6
(RES)SWEET	.173	6.726	.026	.224	38.879	6e7
	-----	-----		-----		6e8
(TOTAL)	.572	19.715		.741		6e9

## (RADC)

NAME	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1	DIR	
BAIR	.340	20.519	.017	.440	60.350	188	6f1
BERGSTRM	.016	.746	.021	.021	46.625	26	6f2
BETHKE	.160	10.723	.015	.207	67.019	68	6f3
CAVANO	.138	10.644	.013	.179	77.130	122	6f4
IUORNO	.057	4.357	.013	.074	76.439	39	6f5
KENNEDY	.141	7.181	.020	.182	50.929	41	6f6
LAMONICA	.216	23.002	.009	.279	106.491	53	6f7
LAWRENCE	.100	7.181	.014	.129	71.810	42	6f8
MCNAMARA	.093	5.941	.016	.120	63.882	131	6f9
PANARA	.104	3.886	.027	.135	37.365	113	6f10

## JUL 22-28, 1973: A WEEK IN REVIEW

RADC	.011	.480	.023	.014	43.636	51	6f14
RZEPKA	.002	.196	.010	.003	98.000	89	6f15
SLIWA	.002	.045	.044	.003	22.500	26	6f16
STONE	.531	34.812	.015	.687	65.559	212	6f17
THAYER	.038	1.556	.024	.049	40.947	34	6f18
TOMAINI	.192	14.085	.014	.248	73.359	47	6f19
	-----	-----		-----		-----	6f20
(TOTAL)	2.141	145.354		2.770		1282	6f21
(PER CENT TOTAL DISK CAPACITY)						2.632%	6f22

## (NETUSERS) TOP FIVE

NAME	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1	
GUEST	1.297	30.217	.043	1.678	23.298	6g1
CASE-10	.617	19.444	.032	.798	31.514	6g2
UCSB	.567	11.800	.048	.734	20.811	6g3
MIT-DMCG	.330	17.739	.019	.427	53.755	6g4
NSRDC	.262	11.374	.023	.339	43.412	6g5
	-----	-----		-----		6g6
(TOTAL)	3.073	90.574		3.976		6g7

(NET) TOTAL	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1	6h
NET	4.943	185.343	.027	6.396	37.496	6h1



JUL 22-28, 1973: A WEEK IN REVIEW

	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1	
(OTHER)						6h3
						6i
						6i1
ENERGY	.008	.889	.009	.010	111.125	6i2
						6i3
						7

18315 Distribution

Susan R. Lee, Beauregard A. Hardeman, Douglas C. Engelbart, Don I. Andrews, Marilyn F. Auerbach, Walt Bass, Charles F. Dornbush, Elizabeth J. (Jake) Feinler, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Mil E. Jernigan, Diane S. Kaye, Kirk E. Kelley, Michael D. Kudlick, Elizabeth K. Michael, Jeanne B. North, James C. Norton, Jeffrey C. Peters, Paul Rech, Dirk H. Van Nouhuys, Kenneth E. (Ken) Victor, Donald C. (Smokey) Wallace, Richard W. Watson, James E. (Jim) White, Duane L. Stone, Thomas F. Lawrence, James H. Bair, L. Peter Deutsch, James G. Mitchell,

JUL 22-28, 1973: A WEEK IN REVIEW

(J18315) 8-AUG-73 11:24; Title: Author(s): Beauregard A.  
Hardeman/BAH; Distribution: /WAR; Sub-Collections: SRI-ARC WAR; Clerk:  
BAH;

From: Pogran.CompNet at MIT-Multics 08/08/73 1425.9 edt Wed

This is a test message to be delivered via the Journal delivery system. We'll see if it works.

18316 Distribution  
Kenneth T. Pogran,

(J18316) 8-AUG-73 11:27; Title: Author(s): Kenneth T. Pogran/KTP ;  
Distribution: /KTP ; Sub-Collections: NIC; Clerk: KTP; .SNF=HIRM;

Planned 8/17 Friday Visit to ARC by Joe Brunon, UCLA

I received a call this week from Hew Crane about Joe Brunon, who is currently at UCLA involved with the Dept of Psychiatry and the Graduate School of Management, formerly from Oregon (State?). I had met him a few years ago briefly when he came thru ARC with Geoff Ball.

1

Joe has been into facilitation, using graphics (he's apparently a talented artist, too) and has REALLY impressed Hew Crane, who has seen others in this arena with far less talent.

2

Joe (who also called me last night) is planning to be in the Menlo Park area (to see Hew and others) next week and would like to meet with Doug (+?) to tell about his approach to facilitation, group communication, etc. and to learn more about us and telecommunications interests we may have.

3

Knowing that we are busy with design, analysis, etc tasks, I suspect that we don't have much energy to spare here, BUT Joe sounds so interesting, that I think Doug would at least like to meet him..mainly on Hew's recommendation.

4

I told Joe that we are not planning to hire anyone in his area of interest this Fall and probably not soon thereafter due to other pressing needs and no extra money. I made this clear so as NOT to encourage him to think of employment here. He was also asking about job possibilities at ARC --he's available due to funding cuts in NIH grants at UCLA.

5

I tentatively set up a visit to ARC (Doug, mainly) for Friday, August 17th starting at 10:30 am. He could show us a videotape (1/2") if we want to take an hour.

6

Joe will be in the area earlier in the week and will call Doug the previous Wednesday 8/15 (I won't be here that week after Tuesday). If there is some reason we can't accomodate his visit, he is prepared for a change in plan.

6a

Joe's telephone: (213) 825-0018. UCLA

7

18317 Distribution

Douglas C. Engelbart, Richard W. Watson, James C. Norton,



JCN 8-AUG-73 12:13 18317

Planned 8/17 Friday Visit to ARC by Joe Brunon, UCLA

(J18317) 8-AUG-73 12:13; Title: Author(s): James C. Norton/JCN;  
Distribution: /DCE RWW JCN; Sub-Collections: SRI-ARC; Clerk: JCN;

Planned Visit to ARC 8/27 am by Sema Marx, CUNY

I received a call today from Sema Marx, Director of Academic Computing for the City University of New York (CUNY). 1

She said she talked with Doug at the NCC and reports he said something to the effect that people really have to come to Menlo Park and spend some time with us to really get a good idea about what we are doing. She was calling to take us up on that since she will be at Stanford at a meeting in a few weeks. 2

I told her that a good part of a morning at ARC was plenty (saturation) and that we had not too much time to spare, but would like to meet and do some showing. 2a

One of the elements of her job is to find ways to encourage use of computing capabilities--looking into the future, too--by students. 3

She mentioned that CUNY has 20 colleges and 250,000 students--also, an annual budget of \$ 500,000,000. (That's right, half a billion, she said--hmm) 3a

She also mentioned working with Ken King--DCE knows? 4

I told her that we would be glad to see her Monday, 8/27 at 10:00 and that she should call the week before to confirm. 5

She will be staying at Rickey's in Palo Alto the week of 8/20. Her phone in NY: (213) 360-2255. 6

18318 Distribution

Douglas C. Engelbart, Richard W. Watson, James C. Norton,

Planned Visit to ARC 8/27 am by Sema Marx, CUNY

(J18318) 8-AUG-73 12:36; Title: Author(s): James C. Norton/JCN;  
Distribution: /DCE RWW JCN; Sub-Collections: SRI-ARC; Clerk: JCN;

Request for Catalog Proof Program Runs

TO: BAH cc: MDK JBN JCN

FROM: MEJ

SUBJECT: Request for Proof Program Runs

Please run Catalog proof programs and give me the printouts on the following files, all of which are in the <NIC-WORK> directory:

- MEJ-CITNEWNICJUN.nls;
- MEJ-CITNICNOTESJUL.nls;
- MEJ-CITNEWNICJUL.nls;
- MEJ-CITNONICJUL.nls;

1  
2  
3  
4

18322 Distribution

Beauregard A. Hardeman, Jeanne B. North, Michael D. Kudlick, James C.  
Norton,

Request for Catalog Proof Program Runs

(J18322) 8-AUG-73 15:21; Title: Author(s): Mil E. Jernigan/MEJ;  
Distribution: /BAH JBN MDK JCN; Sub-Collections: SRI-ARC; Clerk: MEJ;  
Origin: <JERNIGAN>PROOFS.NLS;1, 8-AUG-73 15:18 MEJ ;

Last try on the meeting notes

The hopefully final version of the USING meeting notes is now available for y'all to look at in <BBN-NET>USINGNOTES.NLS;3. Sorry for the delay. Jean, I hope it is in time to make it into the August issue of the NEWS.

--Nancy

1



18323 Distribution

Kirk E. Kelley, Leroy (Lee) C. Richardson, Frank G. Brignoli,  
Elizabeth J. (Jake) Feinler, Michael D. Kudlick, James E. (Jim)  
White, Michael A. Padlipsky, Kenneth L. Bowles, A. Wayne Hathaway,  
Jean Iseli, David H. Crocker, Nancy J. Neigus, Stephen M. Wolfe,  
Ronald M. Stoughton, Jim O. Calvin,

Last try on the meeting notes

(J18323) 8-AUG-73 15:47; Title: Author(s): Nancy J. Neigus/NJN;  
Distribution: /USING; Sub-Collections: NIC USING; Clerk: NJN;

Material for August ARPANEWS

Jean--

I sent you a message as part of USING, to tell you where the latest meeting notes now lives (<BBN-NET>USINGNOTES.NLS), but I was somewhat afraid that it wouldn't get to you in time, and I know there is a very close deadline on submission for the August issue of the ARPANEWS. So please look at it and decide if you want to put it in that issue or not. There are some considerable changes in structure and ordering from Dave's version; if you think they are questionable then wait on it. Otherwise go ahead as you will. I'm really sorry this took so long, but extenuating circumstances and all the other usual excuses apply. Ciao. --Nancy

1

18324 Distribution  
Jean Iseli,

Material for August ARPANEWS

(J18324) 8-AUG-73 15:55; Title: Author(s): Nancy J. Neigus/NJN;  
Distribution: /JI; Sub-Collections: NIC; Clerk: NJN;

Request for Network Mailing Addresses

I have been asked to find out from those in the rje group the user-name (or directory) and host computer to which they would like their network mail directed.

1

i realize that many in the rje group will have already supplied this information through other channels, and in that case please disregard this note.

2

a description of the network mail system of the nic can be found in rfc 543 (17777,).

3

18325 Distribution

Christopher B. Newport, John D. Day, Gary Blunck, Alvin P. Mullery,  
Gregory P. Hicks, Abhay K. Bhushan, Mark C. Krilanovich, Eric F.  
Harslem, Ronald M. Stoughton, James M. Pepin, Gary R. Grossman, Mark  
A. Kampe, John F. Heafner, Robert L. Fink, Robert T. Braden, James E.  
(Jim) White, Alex A. McKenzie, Jonathan B. Postel, Stephen M. Wolfe,  
John W. McConnell, John Gaffney,

Request for Network Mailing Addresses

(J18325) 8-AUG-73 18:18; Title: Author(s): Jonathan B. Postel/JBP;  
Distribution: /RJE; Sub-Collections: NIC RJE; Clerk: JBP;



rje vs. ftp -- need for review of specifications

would someone volunteer to make a carefull study of the ftp and rje specifications and recommend the resolution of the differences ? if you decide to undertake this task (or already have) please let me know.

--jon.

18326 Distribution

Christopher B. Newport, John D. Day, Gary Blunck, Alvin P. Mullery,  
Gregory P. Hicks, Abhay K. Bhushan, Mark C. Krilanovich, Eric F.  
Harslem, Ronald M. Stoughton, James M. Pepin, Gary R. Grossman, Mark  
A. Kampe, John F. Heafner, Robert L. Fink, Robert T. Braden, James E.  
(Jim) White, Alex A. McKenzie, Jonathan B. Postel, Stephen M. Wolfe,  
John W. McConnell, John Gaffney,

rje vs. ftp -- need for review of specifications

(J18326) 8-AUG-73 18:23; Title: Author(s): Jonathan B. Postel/JBP;  
Distribution: /RJE; Sub-Collections: NIC RJE; Clerk: JBP;

info operator and mailboxes

## Thoughts on Information Operator Service

1

Recent discussions with Jeanne North reveal that the NIC is planning to supply network mailbox information on network participants in the participants manual. It was agreed that a single mailbox would be sufficient if:

1a

1) All mailing services had a retry capability so that the need for multiple mailboxes would be alleviated.

1a1

2) Network participants could change their mailboxes on-line without having to advise or consult with NIC or other parties.

1a2

These notions recall the Information Operator idea which I first heard about in RFC 333 (A Proposed Experiment with a Message Switching Protocol) by Bressler, Murphy, and Walden.

1b

In this case, the information needed is a mailbox address for some individual. The information needed to find this person in the Information Operator's tables might be his NIC ident, his last name, or some other tag. Using a standard NIC ident to label all network participants would be very helpful, but I often forget this designation and have to make use of the NIC's finder service to get an ident for someone whose first and last name I know.

1c

It is apparent that the Information Operator ought to service requests for mailbox addresses in machine readable form, perhaps directly in the format required by the FTP or SNDMSG or Submit Message systems. The Information Operator ought also to respond to user queries for correct NIC ident given last name, first name. When ambiguity still results, the Information Operator can respond with a list from which the inquirer can choose.

1d

Maintaining the tables in the Information Operator and keeping local mailbox tables up to date (assuming a message system doesn't query the Information Operator for each transaction) will be something of a chore.

1e

When a message system does not have a mailbox for an individual referenced by NIC ident, it can query the Information Operator.

1e1

When a participant chooses to change his mailbox, he need only advise the Information Operator.

1e2

A message system ought to periodically update its tables of mailbox addresses for participants it keeps local tables for. Perhaps once a week would be sufficient. After a participant changes his mailbox, he may have to look in the old one for a while until all message systems have updated their tables.

1e3

info operator and mailboxes

I would be most interested in your comments on this notion, as I believe it is a natural concomitant of the desire to distribute services while centralizing information (e.g. the RSEXEC system ). 1f

You may leave messages for me at VGC@ISI or at the NIC (ident VGC). 1f1

info operator and mailboxes

(J18327) 8-AUG-73 18:28; Title: Author(s): Vinton G. Cerf/VGC;  
Distribution: /JEW JBN MDK; Sub-Collections: NIC; Clerk: VGC;  
Origin: <SU-AI>INFO.PR;2, 7-AUG-73 10:00 VGC ;

18327 Distribution

James E. (Jim) White, Jeanne B. North, Michael D. Kudlick,

If NIC/Query is used from inside NLS, on return, viewspecs may be changed, and you are not always returned to the file you were in before entering NIC/Query.

1

Update ? updates your file instead of retyping Update and waiting, or returning to \*.

2



18328 Distribution

Diane S. Kaye, Harvey G. Lehtman, Charles H. Irby,

(J18328) 8-AUG-73 19:42; Title: Author(s): A. D. (Buz) Owen/ADO;  
Distribution: /BUGS; Sub-Collections: NIC BUGS; Clerk: ADO;

## Documentation Instigation and Review Team Meeting of August 8

Acting on the previous minutes (mjournal,18294,10) DIRT met from 12:15 to 1:45 today

1

Documents leading up to this meeting include the draft of a writing schedule, (journal,17803,); Mike Kudlick's first cut definition of the help system <kudlick,helpsy> Dean Meyer's justification of command language changes <meyer,comlang,>; my call for yesterday's meeting (journal,18210,); Dian Kaye's further specification of what she hopes for in a data base for HELP. (MJOURNAL,18222,1:w)

2

We spent most of our time discussing the syntax of examples, as it turned out.

3

The syntax of the present usegserguide (userguides,tals-contents,syntax) is obsolete because of the changes in command recognition and echoing in the new command language (meyer,comlang,013).

3a

We agreed to assume recognition mode 3 (meyer,comlang,019) in examples. Mode 3 resembles TENEX recognition..

3b

First cut:

3c

We worked out a syntax for examples based on the following conventions:

3c1

System responses go in parentheses, user typing goes outside parentheses

3c1a

Comments are enclosed in exclamation points.

3c1b

Invisibles typed by the user and all special characters go in angle brackets.

3c1c

† means control character.

3c1d

In all other respects examples are printed exactly as they appear at the terminal.

3c1e

With those assumptions, the command to delete the first word following the semi-colon in statement 0 would look like this:

3c2

```
(: )delete<sp>word<sp>( at ) 0<sp>†;<sp>.w<CR>(
ok?)<CR>(
*)
```

3c2a

Second Cut:

3d

We agreed (,3c2) looked pretty ugly, so Dean raised the

Documentation Instigation and Review Team Meeting of August 8

possibility of presenting each example twice, first as the character stream from the user, second exactly (underlined) as it would appear on her terminal. 3d1

Under the second set of assumptions, parentheses fall away but the angle bracket conventions remains necessary to describe what the user types. 3d2

The same example would look like this: 3d2a

```

If you type:
    delete word<ALT><CR>0 '; .w<CR><CR>
It should look like this:
    * delete word at 0 '; .w
ok?
*
    
```

3d2a1

We agreed to write trial presentation for two commands each for a meeting tomorrow. Each presentation should be a branch with the following form: 4

(commandname) 4a

(syntax)##(link to appropriate place in <userguides,commands,> 4a1

(function).....6 lines.... 4a2

(example) a line of explanation  
 If you type this:  
 .....  
 It should look like:  
 ..... 4a3

We agreed to ask Dean to reserve angle brackets for marking out special characters, and use something else for indicating system response in the command syntax. 5

We briefly discussed style. 6

we agreed to refer to the reader of the upcoming documentation as the "user" in more general contexts and address her directly as "you", or in the imperative, when giving specific instructions. 6a

For example: "Users may control the format of printed documents by means of the output processor.....To insert a directive you first... 6a1

We agreed to study my guidelines on style in (mjournal,17799,3a)

Documentation Instigation and Review Team Meeting of August 8

and that all of us would be present at the dull writing meeting tomorrow.

6b

18329 Distribution

Dirk H. Van Nouhuys, Michael D. Kudlick, Diane S. Kaye, James C. Norton, Jeanne M. Beck, N. Dean Meyer, Richard W. Watson, James C. Norton, Laura E. Gould,

Documentation Instigation and Review Team Meeting of August 8

(J18329) 8-AUG-73 21:19; - Title: Author(s): Dirk H. Van Nouhuys/DVN;  
Distribution: /DIRT JMB NDM RWW JCN LEG; Sub-Collections: SRI-ARC DPCS  
DIRT; Clerk: DVN;  
Origin: <VANNOUHUYS>DIRTMIN.NLS;1, 8-AUG-73 21:15 DVN ;

Several tries at loading imnl.sdac were unsuccessful. My guess is that I need to be able to tell IMLOAD that I have a BBN type loader, but don't know how, or can't with the present version of IMLOAD. The loader is one I got from CHI at ICC, on cassette. Buz

1



18330 Distribution  
Kenneth E. (Ken) Victor,

(J18330) 8-AUG-73 21:35; Title: Author(s): A. D. (Buz) Owen/ADO;  
Distribution: /KEV; Sub-Collections: NIC; Clerk: ADO;

VISIT

DEAR DOUG,

1

I WILL BE IN STANFORD FOR THE AI CONFERENCE AND WOULD WELCOME AN OPPORTUNITY TO MEET WITH YOU AND TALK ABOUT NLS-SCHOLAR. WOULD THURSDAY OR FRIDAY, AUG 23 OR 24, BE GOOD FOR YOU? PLEASE LET ME KNOW.

2

LAURA GOULD TOLD ME YOU HAD NEITHER RECIVED MY LETTER OF JUNE 5 NOR A COPY OF THE PROPOSAL ("MIXED-INITIATIVE TUTORIAL SYSTEM TO AID USERS OF THE NLS). WE SENT YOU A SECOND COPY THAT I TRUST YOU NOW HAVE.

3

SINCERELY,

4

MARIO GRIGNETTI

5

VISIT

(J18331) 9-AUG-73 07:13; Title: Author(s): Mario C. Grignetti/MCG;  
Distribution: /DCE; Sub-Collections: NIC; Clerk: MCG;

**"Novices": New Command Language**

There will be no "Novice Mode" in the new command language. What we want to do is to insure that beginning users get the following settings--

FEEDBACK FULL (system default)

PROMPTS ON (system default)

TENEX "anticipatory" command recognition algorithm

There will be a way to set everybody's favorite default command recognition scheme. This will probably be via the Ident system or the Initials files. Beginners will then automatically get the right default because we will make sure it gets set that way for them. Obviously, there is no problem in satisfying our other goals for the beginning novice, since the settings correspond to system defaults.

1

1a

1b

1c

2

"Novices": New Command Language

(J18332) 9-AUG-73 09:01; Title: Author(s): Diane S. Kaye/DSK;  
Distribution: /DIRT HGL MDK CHI CFD EKM; Sub-Collections: SRI-ARC DIRT;  
Clerk: DSK;  
Origin: <KAYE>NOVMODEDIES.NLS;2, 9-AUG-73 08:53 DSK ;

fy-75 tpo summary (six page version)

.PGN=0

fy-75 tpo summary (six page version)

TPO NO 11 SOFTWARE SCIENCES TECHNOLOGY

GENERAL OBJECTIVE:

The general objective of this TPO is to develop techniques to improve the specification, testing, evaluation and reliability of software and to improve the Air Force's ability to specify, build and utilize effective management information systems.

SPECIFIC GOALS:

MANAGEMENT INFORMATION SYSTEMS - This area has essentially two thrusts:

The development of non-functional software to provide users the ability to manipulate large data bases for Command and Control and Air Force Management systems with particular emphasis on multi-level security and data management modeling and testing procedures and;

The development of on-line computer tools, which directly aid the Air Force knowledge worker (commander, manager, worker).

SOFTWARE TECHNOLOGY - The objective of this area is to formulate a well-defined and controlled HOL or set of HOLS that will meet total Air Force requirements.

Software Validation and Reliability - This area has essentially three major thrusts:

The development of uniform and responsive S/W documentation guidelines and/or standards;

The design and development of automated software verification systems and standardized compiler validation systems;

The development of S/W complexity and reliability measures and techniques for modeling and predicting software performance.

SECURITY TECHNOLOGY - The goal is to provide Air Force users with the ability to share EDP systems and the information therein with the assurance that classified information stored and processed will receive appropriate protection.

TECHNICAL APPROACH:

MANAGEMENT INFORMATION SYSTEMS

In the data management area, RADC is completing the first



fy-75 tpo summary (six page version)

implementation of a data management system DM-1 (Data Manager). This system is extremely flexible in design, is programmed in JOVIAL and its overall design contains the best features of many other systems incorporated into one system design. From DM-1 will come many of the items that will aid in future Data Management acquisition. An in-house effort to investigate the potential of the ARPA sponsored MULTICS operating system as a host for data management has been highly successful.

As a result, a GCOS Multics File Transfer Facility is being built for the Data Services Center using these functions and the program is expanding in conjunction with ESD/MCI in producing a secure data management system within a modified MULTICS. Exploratory efforts are also beginning to assess the feasibility of distributed data management using the ARPA network and also the effect of associative processing on data management requirements and capabilities.

In the data management testing area, RADC & JTSA are jointly supporting research to develop data management evaluation tools. Currently, a user is forced to assess the systems on a parameter type basis. And it is not until he has implemented, does he find out his deficiencies. A second chance is too costly. It is the goal of this area to develop a Simulation Facility where the user can analytically and empirically experiment with his problem and various DMS alternatives prior to a commitment to a specific system.

The other main thrust in the Management Information Systems area is in the exploitation and assessment of the on-line system developed by SRI under ARPA sponsorship called Augmentation Knowledge Workshop.

RADC personnel have monitored this program for the past five years and are convinced that the feasibility of significant job performance improvement in an intellectual knowledge worker environment is indeed possible. The system provides on-line tools for a set of core activities which all knowledge workers do regardless of their special interests such as studying, analyzing, conferring, communicating, and documenting. SRI has developed the system through a "Bootstrapping" process where the system's capabilities at any particular instance in time are used to further develop the system.

The development activity during FY-73 has been concentrated on acquiring the necessary physical plant for use and evaluation of the SRI/AKW system. RADC is connected to the ARPA Net via a standard H316 Terminal Interface Processor (The initial specification of a baseline management system complete with SOPs,

fy-75 tpo summary (six page version)

file design, and personnel role assignment has been completed.) The research group at RADC has progressed to the point where they are doing the bulk of their daily work using the system; in fact, this TPO was prepared, coordinated and edited a number of times using the system. The FY-74 activity will be concentrated on training the rest of the ISI branch (approximately 40 people).

The assessment at RADC will cover a two-year period, and include engineers, secretaries, administrators, and managers at three levels in the chain of command. The evaluation will evolve slightly behind the actual implementation of the system within the ISI Branch. Results on the effectiveness of the system in augmenting individuals and teams will be available near the middle of FY-74 and organizational results at the end of FY-74. If promising, it is planned to create a large scale prototype at RADC, probably the Information Sciences Division - 120 people - elements of staff and center management.

SOFTWARE TECHNOLOGY - RADC investigated the problems related to HOL use and directly related them to:

The non-responsiveness of a particular HOL to its Air Force application.

The inability to completely and unambiguously define a HOL.

The inability to completely test a HOL compiler (implementation on a computer).

Costs and time delays related to compiler building.

Poor and varying HOL manuals.

In response to these problems, RADC has:

Completed development of a HOL (JOVIAL J/73) more responsive to a large class of Air Force problems.

Sponsored development of a powerful meta-language to completely specify a HOL.

Developed and sponsored HOL compiler validators.

Undertaken the development of a tool to automatically implement compilers (JOCIT).

Developed a computer independent JOVIAL manual. All of these concepts are being tested out on the JOVIAL HOL, but are directly applicable to other HOLS the Air Force uses.

fy-75 tpo summary (six page version)

Software Validation and Reliability - The approach taken to achieve the objectives of the task consists of the following subtasks:

Develop uniform and responsive software documentation guidelines and/or standards that are suitable for the purposes of design, coding, debugging, testing, and the updating of software.

Design, develop and evaluate an Automated Verification System (AVS), or Systems, which will be used to improve the reliability of software.

Develop standard Compiler Validation Systems and/or techniques to reduce procurement cost and improve the confidence in compilers.

Investigate the nature of software errors, their classification, their removal via testing, the prediction of their occurrence, and techniques for writing low error content software.

Develop measures for software complexity and reliability.

SECURITY TECHNOLOGY - Recent theoretical work has developed a generalized model for protection systems. It has been shown that the two-dimensional vertical memory addressing scheme of the Multics system is a special case of this protection system model. The approach is to build on the Multics vertical memory foundation. Since this approach is based on concepts already shown to be technically and economically feasible, the planned development concentrates on applying them to satisfy USAF computer security requirements. Areas of investigation include: central computer and its operating system, front end processor/crypto-multiplexor, secure terminals and application engineering.

#### APPLICATION TO AIR FORCE TECHNOLOGY PROGRAMS:

##### MANAGEMENT INFORMATION SYSTEMS

The knowledge gained in this area in many cases will be used directly such as the GCOS Multics File Transfer capability, secure DMS, and Data Management Modeling Facility. In other instances, knowledge gained will be used to assist SPO offices and individual using organizations in acquiring sophisticated MISs for their specific application.

##### SOFTWARE TECHNOLOGY

fy-75 tpo summary (six page version)

This technology is directly applicable to any program planning to exploit a HOL, such as the Digital Avionics Information System(DAIS) under development by AFAL and the WWMCCS computer systems.

The knowledge gained in this area will be used directly to support existing and follow-on software system procurements, both at RADC as well as other Air Force laboratories and installations. In other cases, knowledge gained will be used to monitor and substantially affect the procurement and timely delivery of reliable and cost effective software.

#### SECURITY TECHNOLOGY

This effort will provide technology that can be used to satisfy the security requirements of a number of planned Air Force systems that are now technically infeasible. In addition, it will assure the certification of EDP systems security controls and eliminate costs of current dedicated computer usage to achieve computer security.

#### RELATIONSHIP TO OTHER AGENCY PROGRAMS:

##### MANAGEMENT INFORMATION SYSTEMS

In the case of ARPA, some of their research is exploited directly using the ARPA Net. The SRI work is an excellent example. Research sponsored by JTSA, particularly in DMS testing will be closely followed and should complement our program in this area.

Research in the areas of security data management sponsored by ARPA is of particular interest. For example, the research at USC/ISI in the area of MIS is extremely relevant. They are examining the entire question of how does a large organization have more than one MIS which can effectively serve the mission

\*\*divisions and yet be responsive to the larger corporate management needs.

##### SOFTWARE TECHNOLOGY

The RADC HOL program has utilized Compiler Validators developed by NBS and the Navy, and has coordinated findings with NASA in its design of a compiler building tool. In addition, the Navy (NELC) is investigating the use of the meta-language developed, and the FAA is interested in the HOL developed for use in Air Traffic control.

Research in software validation activities at the Advanced Ballistic Missile Defense Agency (ABMDA), Huntsville, Alabama,

fy-75 tpo summary (six page version)

directly supports comparable activities in effort. NASA sponsored work to implement automated software spacecraft center validation systems at the manned is another example of particular interest.

ARPA sponsored work at Carnegie-Mellon University in Software Reliability directly supports software architecture and engineering activities at MITRE.

NSF and NBS activities at SRI further complement RADC efforts aimed at certifying the correctness of programs.

#### SECURITY TECHNOLOGY

DIA has conducted studies of security in the DIAOLS System, which has exposed weaknesses but does not provide positive direction for development of an open secure system. NSA is investigating a number of computer related security problems and is particularly involved in the communication security problem. ARPA sponsors research in new computer architecture for security and is funding teams that attempt to penetrate existing systems.

#### FY-75 FUNDS REQUIRED:

PROG ELEMENT/ PROJ NR	TITLE	S&E (MY)	TOTAL PROJ FUNDS(\$K)	PROJ FUNDS SPTG TPO(\$K )
62702F/5581	Info Proc Development	22.8	2850	2625/1475
63728F/5550	Adv Comp Technology	5.9	800/4770	208/2225
	TOTAL	28.7	3650/4770	2833/2225

#### ESTIMATED FY-75 FUNDS TO BE RECEIVED FROM OTHER AGENCIES:

AGENCY	FUNDS
61101D/0967 ARPA Net Info Ctr & Comp Aug	1900

#### FY-76-79 FUNDS REQUIRED TO SUPPORT TPO:

PROG ELEMENT/ PROJ NR	TITLE	FY-76	FY-77	FY-78	FY-79
62702F/5581	Info Processing Development	2622/0	2700/0	2600/0	2840/0
63702F/5550	Advanced Comp Technology	1680/4915	2700/830	2400/0	3500/0
61101D/0967	Net Info Ctr & Comp Aug	(2000/0)	(2000/0)	(2000/0)	(2000/0)
64XXX/XXXX	Prototype AKW's RADC Applications	(250)	(1080)	(1000)	(1000)

fy-75 tpo summary (six page version)

TOTAL	4302/4915	5400/830	5000/0	6340/0
	(2250/0)	(3080/0)	(3000/0)	(3000/0)

fy-75 tpo summary (six page version)

(J18333) 9-AUG-73 10:21; Title: Author(s): Frank J. Tomaini/FJT;  
Distribution: /EJK JLM DLS TJB2; Sub-Collections: RADC; Clerk: FJT;  
Origin: <MCNAMARA>FT.NLS;2, 8-AUG-73 15:25 JCP ;

FY-75 TPO Summary (8 page version)

. PGN= 0



FY-75 TPO Summary (8 page version)

TPO NO 11 SOFTWARE SCIENCES TECHNOLOGY

GENERAL OBJECTIVE:

The general objective of this TPO is to develop techniques to improve the specification, testing, evaluation and reliability of software and to improve the Air Force's ability to specify, build and utilize effective management information systems.

SPECIFIC GOALS:

MANAGEMENT INFORMATION SYSTEMS - This area has essentially two thrusts:

The development of non-functional software to provide users the ability to manipulate large data bases for Command and Control and Air Force Management systems with particular emphasis on multi-level security and data management modeling and testing procedures and;

The development of on-line computer tools, which directly aid the Air Force knowledge worker (commander, manager, worker).

SOFTWARE TECHNOLOGY - The objective of this area is to formulate a well-defined and controlled HOL or set of HOLS that will meet total Air Force requirements.

Software Validation and Reliability - This area has essentially three major thrusts:

The development of uniform and responsive S/W documentation guidelines and/or standards;

The design and development of automated software verification systems and standardized compiler validation systems;

The development of S/W complexity and reliability measures and techniques for modeling and predicting software performance.

SECURITY TECHNOLOGY - The goal is to provide Air Force users with the ability to share EDP systems and the information therein with the assurance that classified information stored and processed will receive appropriate protection.

TECHNICAL APPROACH:

MANAGEMENT INFORMATION SYSTEMS

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In the data management area, RADC is completing the first implementation of a data management system DM-1 (Data Manager). This system is extremely flexible in design, is programmed in JOVIAL and its overall design contains the best features of many other systems incorporated into one system design. From DM-1 will come many of the items that will aid in future Data Management acquisition. An in-house effort to investigate the potential of the ARPA sponsored MULTICS operating system as a host for data management has been highly successful.

As a result, a GCOS Multics File Transfer Facility is being built for the Data Services Center using these functions and the program is expanding in conjunction with ESD/MCI in producing a secure data management system within a modified MULTICS. Exploratory efforts are also beginning to assess the feasibility of distributed data management using the ARPA network and also the effect of associative processing on data management requirements and capabilities.

In the data management testing area, RADC & JTSA are jointly supporting research to develop data management evaluation tools. Currently, a user is forced to assess the systems on a parameter type basis. And it is not until he has implemented, does he find out his deficiencies. A second chance is too costly. It is the goal of this area to develop a Simulation Facility where the user can analytically and empirically experiment with his problem and various DMS alternatives prior to a commitment to a specific system.

The other main thrust in the Management Information Systems area is in the exploitation and assessment of the on-line system developed by SRI under ARPA sponsorship called Augmentation Knowledge Workshop.

RADC personnel have monitored this program for the past five years and are convinced that the feasibility of significant job performance improvement in an intellectual knowledge worker environment is indeed possible. The system provides on-line tools for a set of core activities which all knowledge workers do regardless of their special interests such as studying, analyzing, conferring, communicating, and documenting. SRI has developed the system through a "Bootstrapping" process where the system's capabilities at any particular instance in time are used to further develop the system.

The development activity during FY-73 has been concentrated on acquiring the necessary physical plant for use and evaluation of the SRI/AKW system. RADC is connected to the ARPA Net via a standard H316 Terminal Interface Processor (The initial

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specification of a baseline management system complete with SOPs, file design, and personnel role assignment has been completed.) The research group at RADC has progressed to the point where they are doing the bulk of their daily work using the system; in fact, this TPO was prepared, coordinated and edited a number of times using the system. The FY-74 activity will be concentrated on training the rest of the ISI branch (approximately 40 people).

The assessment at RADC will cover a two-year period, and include engineers, secretaries, administrators, and managers at three levels in the chain of command. The evaluation will evolve slightly behind the actual implementation of the system within the ISI Branch. Results on the effectiveness of the system in augmenting individuals and teams will be available near the middle of FY-74 and organizational results at the end of FY-74. If promising, it is planned to create a large scale prototype at RADC, probably the Information Sciences Division - 120 people - elements of staff and center management.

SOFTWARE TECHNOLOGY - RADC investigated the problems related to HOL use and directly related them to:

The non-responsiveness of a particular HOL to its Air Force application.

The inability to completely and unambiguously define a HOL.

The inability to completely test a HOL compiler (implementation on a computer).

Costs and time delays related to compiler building.

Poor and varying HOL manuals.

In response to these problems, RADC has:

Completed development of a HOL (JOVIAL J/73) more responsive to a large class of Air Force problems.

Sponsored development of a powerful meta-language to completely specify a HOL.

Developed and sponsored HOL compiler validators.

Undertaken the development of a tool to automatically implement compilers (JOCIT).

Developed a computer independent JOVIAL manual. All of

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these concepts are being tested out on the JOVIAL HOL, but are directly applicable to other HOLS the Air Force uses.

Software Validation and Reliability - The approach taken to achieve the objectives of the task consists of the following subtasks:

Develop uniform and responsive software documentation guidelines and/or standards that are suitable for the purposes of design, coding, debugging, testing, and the updating of software.

Design, develop and evaluate an Automated Verification System (AVS), or Systems, which will be used to improve the reliability of software.

Develop standard Compiler Validation Systems and/or techniques to reduce procurement cost and improve the confidence in compilers.

Investigate the nature of software errors, their classification, their removal via testing, the prediction of their occurrence, and techniques for writing low error content software.

Develop measures for software complexity and reliability.

SECURITY TECHNOLOGY - Recent theoretical work has developed a generalized model for protection systems. It has been shown that the two-dimensional vertical memory addressing scheme of the Multics system is a special case of this protection system model. The approach is to build on the Multics vertical memory foundation. Since this approach is based on concepts already shown to be technically and economically feasible, the planned development concentrates on applying them to satisfy USAF computer security requirements. Areas of investigation include: central computer and its operating system, front end processor/crypto-multiplexor, secure terminals and application engineering.

#### APPLICATION TO AIR FORCE TECHNOLOGY PROGRAMS:

##### MANAGEMENT INFORMATION SYSTEMS

The knowledge gained in this area in many cases will be used directly such as the GCOS Multics File Transfer capability, secure DMS, and Data Management Modeling Facility. In other instances, knowledge gained will be used to assist SPO offices

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and individual using organizations in acquiring sophisticated MISs for their specific application.

#### SOFTWARE TECHNOLOGY

This technology is directly applicable to any program planning to exploit a HOL, such as the Digital Avionics Information System(DAIS) under development by AFAL and the WWMCCS computer systems.

The knowledge gained in this area will be used directly to support existing and follow-on software system procurements, both at RADC as well as other Air Force laboratories and installations. In other cases, knowledge gained will be used to monitor and substantially affect the procurement and timely delivery of reliable and cost effective software.

#### SECURITY TECHNOLOGY

This effort will provide technology that can be used to satisfy the security requirements of a number of planned Air Force systems that are now technically infeasible. In addition, it will assure the certification of EDP systems security controls and eliminate costs of current dedicated computer usage to achieve computer security.

#### RELATIONSHIP TO OTHER AGENCY PROGRAMS:

##### MANAGEMENT INFORMATION SYSTEMS

In the case of ARPA, some of their research is exploited directly using the ARPA Net. The SRI work is an excellent example. Research sponsored by JTSA, particularly in DMS testing will be closely followed and should complement our program in this area.

Research in the areas of security data management sponsored by ARPA is of particular interest. For example, the research at USC/ISI in the area of MIS is extremely relevant. They are examining the entire question of how does a large organization have more than one MIS which can effectively serve the mission divisions and yet be responsive to the larger corporate management needs.

#### SOFTWARE TECHNOLOGY

The RADC HOL program has utilized Compiler Validators developed by NBS and the Navy, and has coordinated findings with NASA in its design of a compiler building tool. In addition, the Navy

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(NELC) is investigating the use of the meta-language developed, and the FAA is interested in the HOL developed for use in Air Traffic control.

Research in software validation activities at the Advanced Ballistic Missile Defense Agency (ABMDA), Huntsville, Alabama, directly supports comparable activities in effort. NASA sponsored work to implement automated software spacecraft center validation systems at the manned is another example of particular interest.

ARPA sponsored work at Carnegie-Mellon University in Software Reliability directly supports software architecture and engineering activities at MITRE.

NSF and NBS activities at SRI further complement RADC efforts aimed at certifying the correctness of programs.

SECURITY TECHNOLOGY

DIA has conducted studies of security in the DIAOLS System, which has exposed weaknesses but does not provide positive direction for development of an open secure system. NSA is investigating a number of computer related security problems and is particularly involved in the communication security problem. ARPA sponsors research in new computer architecture for security and is funding teams that attempt to penetrate existing systems.

FY-75 FUNDS REQUIRED:

PROG ELEMENT/ PROJ NR	TITLE	SSE (MY)	TOTAL PROJ FUNDS(\$K)	PROJ FUNDS SPTG TPO(\$K )
62702F/5581	Info Proc Development	22.8	2850	2625/1475
63728F/5550	Adv Comp Technology	5.9	800/4770	208/2225
	TOTAL	28.7	3650/4770	2833/2225

ESTIMATED FY-75 FUNDS TO BE RECEIVED FROM OTHER AGENCIES:

AGENCY	FUNDS
61101D/0967 ARPA Net Info Ctr & Comp Aug	1900

FY-76-79 FUNDS REQUIRED TO SUPPORT TPO:

PROG ELEMENT/ PROJ NR	TITLE	FY-76	FY-77	FY-78	FY-79
62702F/5581	Info Processing	2622/0	2700/0	2600/0	2840/0

FY-75 TPO Summary (8 page version)

	Development				
63702F/5550	Advanced Comp Technology	1680/4915	2700/830	2400/0	3500/0
61101D/0967	Net Info Ctr & Comp Aug	(2000/0)	(2000/0)	(2000/0)	(2000/0)
64XXX/XXX	Prototype AKW's	(250)	(1080)	(1000)	(1000)
	RADC Applications				
	TOTAL	4302/4915	5400/830	5000/0	6340/0
		(2250/0)	(3080/0)	(3000/0)	(3000/0)

FY-75 TPO Summary (8 page version)

(J18334) 9-AUG-73 10:25; Title: Author(s): Frank J. Tomaini/FJT;  
Distribution: /EJK JLM DLS TJB2; Sub-Collections: RADC; Clerk: FJT;



TNLS Bug, Addr '01' interpreted as origin in Print Statement

'P[rint ]S[tatement at A: ].01 CA CA' prints the origin statement, rather than statement 1, even if statement 1 exists. An '02' gives a '?', even if statement 2 exists. Leading zeroes on statement numbers lose.

TNLS Bug, Addr '01' interpreted as origin in Print Statement

(J18336) 9-AUG-73 12:41; Title: Author(s): James E. (Jim)  
White/JEW; Distribution: /BUGS; Sub-Collections: SRI-ARC BUGS; Clerk:  
JEW;

pitch preparation

i am creating a file called pitch in it i am putting in little  
goodies that might beuseful in putting together the pit h for the  
steering group take a lodk at any time. any inputs will be selocomed.

1

pitch preparation

(J18337) 9-AUG-73 13:11; Title: Author(s): Edmund J. Kennedy/EJK;  
Distribution: /JLM RBP FJT DLS; Sub-Collections: RADC; Clerk: EJK;

## Ident Confusion Reported by BBN-TENEX

Bob Thomas (RHT) of BBN-TENEX has reported to us that during the last week or two, he has received delivery of at least three Journal items intended for Richard Thayer (RHT2) of RADC, authored respectively by Frank Tomaini (FJT), Duane Stone (DLS), and Tom Lawrence (TFL), all of RADC.

1

The problem obviously is that Bob Thomas' and Richard Thayer's idents are similar -- RHT and RHT2, respectively -- and are being confused by RADC users. See (18164,) as an example.

2

The intent of this memo is to point out the potential pitfall. Bob Thomas suggests that NLS could (and should) assist the user in avoiding such mistakes by echoing a user's full name (and perhaps affiliation) when his ident is typed in the distribution list during Journal submission, and insisting upon confirmation by the user before preceding. The suggestion is well taken, and we will attempt to provide some such safeguard for the sender. In the meantime, please be careful.

Jim White  
NIC

3

Ident Confusion Reported by BBN-TENEX

(J18338) 9-AUG-73 13:55; Title: Author(s): James E. (Jim) White/JEW;  
Distribution: /RADC RHT WRS2 MDK JBN; Sub-Collections: SRI-ARC RADC;  
Clerk: JEW;  
Origin: <WHITE>RADCMSG.NLS;2, 9-AUG-73 13:53 JEW ;

Calculator Language Changes

These are my own suggestions for the calculator using the new parser. I want to send them out so that others will add theirs and we can firm it up. Please R.S.V.P.

## Calculator Language Changes

We need to write a grammar for the calculator subsystem. Before we can do this, I propose we discuss what name changes would be in order. There are certain new system conventions about command names which we must heed (set, show, quit) and also the main rule: VERB/NOUN.

1

## NEW CALCULATOR COMMANDS

2

Just to get a discussion going, I have outlined what I would like to see. Please join in and suggest whatever details you find appropriate.

2a

System noise words are shown in parantheses.

2a1

## COMMANDS RETAINING OLD FORMAT

2b

Clear (Current Accumulator)

2b1

Use (Accumulator #)

2b2

Write (New File)

2b3

## COMMANDS REQUIRING CHANGE

2c

Evaluate (Expression:) SP <LSEL?> (formerly "Value" (of))

2c1

Format (Result Values) ---system interrogates user, as currently done.

2c2

Currently there is a feedback terse/verbose type option under Format. I propose having the calculator obey the standard NLS feedback setting, and the user may execute the NLS "SET FEEDBACK ..." command if he wishes to change this while in the calculator.

2c2a

Insert Accumulator (after) <ENTITYNAME> <DSEL>

2c3

Insert Total (in CALC-file)

2c4

Quit Calculator--NLS standard "Quit" <SUBSYSTEM>--(formerly "Quit")

2c5

Quit Returning (this Session)

2c6

How can we make this consistent with NLS Quit, which never



## Calculator Language Changes

takes another type of keyword besides <SUBSYSTEM>?--(formerly "Quit Return"(this Session)	2c6a
Replace <ENTITYNAME> <SSEL> (by Accumulator)	2c7
Show Accumulators (formerly "List Accumulators")	2c8
OPERATORS, OPERANDS (The "Calculate" Command)	2c9
<p>I propose we make A, S, M, and D act exactly like VERB commands which expect a NOUN, the typed in or addressed numerical or accumulator ID value. We should treat the special symbols (-,=,*,X,x,/) in the same logical way, giving appropriate feedback in the Command Feedback Line. (As indicated below under SUMMARY, these commands are all top-level first-letter defaults. In fact, only "Subtract" currently shares a first letter with another command.)</p>	
	2c9a
Add (formerly 'A)	2c9b
Subtract (formerly 'S)	2c9c
Multiply (formerly 'M)	2c9d
Divide (formerly 'D)	2c9e
+ [feedback to be "+ (Add)"]	2c9f
- [feedback to be "- (Subtract)"]	2c9g
*,X,x [feedback to be "<typed in char> (Multiply)"]	2c9h
/ [feedback to be "/ (Divide)"]	2c9i
The parameter which follows the VERBS listed above is a <CALCNSEL>, a Calculator Number Selection	2c9j
--bugged	2c9j1
--'#n where n=1-10 (an accumulator ID)	2c9j2
--typed in number	2c9j3
--an addressed number (format?) maybe this requires typing OPTION (formerly in TNLS, an exclamation	

## Calculator Language Changes

point( ))

2c9J4

NOTE --> We should draw up our plans now so that the documentation staff can be allowed enough time to get out two revised userguides and the HELP data base information about the Calculator language. I want you to give me feedback and then we can probably flatten this problem in one meeting of the Calculator Design/Review Teams plus CFD.

## SUMMARY

	3
ADD	3a
Add	3a1
Clear (Current Accumulator)	3a2
Divide	3a3
Evaluate (Expression:)	3a4
Format (Result Values)	3a5
Insert Accumulator (after)	3a6
Insert Total (in CALC-file)	3a7
Multiply	3a8
Quit Calculator	3a9
Quit Returning (this Session)	3a10
Replace <ENTITYNAME> <SSEL> (by Accumulator)	3a11
Subtract	3a12
Show Accumulators	3a13
Use (Accumulator #)	3a14
Write (New File)	3a15
+	3a16
-	3a17
*,X,x	3a18

Calculator Language Changes

(J18339) 9-AUG-73 13:57; Title: Author(s): Diane S. Kaye/DSK;  
Distribution: /RWW DVN CHI CFD EKM JCN NDM JDH MDK; Sub-Collections:  
SRI-ARC; Clerk: DSK;  
Origin: <KAYE>CALCGRAM.NLS;6, 9-AUG-73 13:49 DSK ;