DCE 9-NOV-73 12:35 20143

Visit Log: 25 Jul 73, Dr. Stanley Taylor, Army Ballistic Research Laboratories

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Dr. Stanley M. Taylor, AMXBR-XA
USA Ballistic Research Laboratories
Aberdeen Proving Ground, Maryland 21005
(301) 278-4149, 3389

1

His role and activity there: He is an assistant to the Director of the Labs, concerned with computer applications, acquisitions, etc. BRL will connect to the ARPANET about in Sept, with an updated version of the Illinois ANTS (in a PDP-11/40, connected to an IMP). Taylor had stopped by to learn about the NIC services; he talked with Mike and Jeanne for about an hour, Jeanne showed him a bit of DNLS, and some of the on-line aslects of SNDMSG, Journal, etc., and a bit of probing around the Net. The BRL system will have 16 tty type terminals along with 2 RJE terminals, one of which will have tape transports along with card reader and printer.

2

Mentioned that the people at BRL who have for years been working with firing tables, are being physically relocated; the NET-type flexibility or RJE use will now allow them to continue working, at their new site.

2a

The interest at BRL, in Networks, arises from a great pressure to avail themselves of more resources, as well as a need to provide service to a wider community of users.

2b

They are working in conjunction with the Army Materiel Command, and their CDC system at Ft. Belvoir, Virginia (which system is to be part of the planned AMC Network, see -- 12442,2:gw). BRL povides the technical support to the AMC Headquarters in evaluating the ARPANET concept, for potential use in the AMC Net.

2c

He mentions an activity going on igt now in their Lab, where a couple of people are investigating a means for retrieving phrases within a document, where (apparently) there are inverted indices established for each of these "key phrases" -- then one can ask for searches on key-phrase combinations, and get back a fairly detailed description of the location and nature of the occurrences. He promises to send us some documentation on their work.

2d

Demonstrate our content-analyzer facility, which provides essentially euivalent service, albeit slower and more expensive than with an inverted index. ["Knowledge Workshop"]; (12445,1:hctmzi)

2d1

With Jeanne, in going through the NIC Idents, he found the Army Ordnance Schoool at Aberdeen Proving Grounds. It occurs to him that a teaching application, at that school, could be a possibility to

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follow up. (Indeed...Describe O'sullivan/Kibler CBI community to Taylor, also the SCHOLAR/NLS activity at BBN) 3

Taylor pictures ways to use these AKW facilities for more general teaching activities such as they are often engaged in: e.g. having professors from nearby universities come and teach, or their people going out to classes. Wouldn't it be handy if they could communicate and collaborate (in the teaching/learning process) via such techniques? 3a

Have average of 5 people per week off somwhere taking a short course of some sort; and, on site, during the winter, they have almost a full curriculum in what the call the "Ballistic Institute." 3a1

DIscussed ways and means for his considering an exploratory stab at the Utility use, and how to go about it. There are quite a number of potential applications, including someone to serve for the AMC Network as a Central Community Information Service; also noted that ther are some very heavy documentation needs within some of the production arms of the AMC; also, control of completeness, quality, and distribution of the computer/data resources available to users of the AMC Net would be an important central service, well suited to be supported via the AKW techniques. 4

One means would be through the AMC-Network Steering Committee (could I, or some ARC rep, give a presentation to them). Also, perhaps a presentation directly to the AMC Computer-Aided Design & Engineering Council (CAD-E Council). 4a

Minimum Utility subscription, at $40K/yr. Terminals -- typewriters o.k. for TNLS; IMLACs for DNLS; forthcoming interface box (at like $1,000 to 1,5000) to make almost any modern text-only, tty-compatible, display unit compatible for DNLS. 4b

If they have a Hazeltine; they can buy box (or even the boards), and they have engineering talent to assemble, maintain, etc. 4c

Gave him the following documents: 5

Augmentation Research Center, ONLINE TEAM ENVIRONMENT: NETWORK INFORMATION CENTER and COMPUTER AUGMENTED TEAM INTERACTION, Final Report on project RADC-TR-72-232, June 1972 (Journal -- 13041,) 5a

D. C. Engelbart, AUGMENTING HUMAN INTELLECT: A CONCEPTUAL FRAMEWORK, SRI Project AFOSR-3223, October 1962 (XDOC -- 3906) 5b

D. C. Engelbart and W. K. English. "A Research Center for

Visit Log: 25 Jul 73, Dr. Stanley Taylor, Army Ballistic Research Laboratories

Augmenting Human Intellect", AFIPS Proceedings, Fall Joint Computer Conference, 1968, Washington, D.C. (XDOC -- 3954.) 5c

D. C. Engelbart, "Intellectual Implications of MULTI-ACCESS COMPUTER NETWORKS", A paper for the Proceedings of The Interdisciplinary Conference on Multi-Access Computer Networks in Austin, Texas, April 1970. (XDOC -- 5255.) 5d

D. C. Engelbart, R. W. Watson, J. C. Norton, THE AUGMENTED KNOWLEDGE WORKSHOP, paper presented at the National Computer Conference, New York City, June 1973. (Journal -- 14724.) 5e

D. C. Engelbart, SRI-ARC SUMMARY for IPT CONTRACTOR-MEETING, summary report of work done at ARC during 1972. (Journal -- 13537.) 5f

D. C. Engelbart, DESIGN CONSIDERATIONS FOR KNOWLEDGE WORKSHOP TERMINALS, paper presented at the National Computer Conference, New York City, June 1973. (Journal -- 14851.) 5g

D. C. Engelbart, COORDINATED INFORMATION SERVICES for a DISCIPLINE- OR MISSION-ORIENTED COMMUNITY, paper presented at the Second Annual Computer Communications Conference, San Jose, California, 24 January 1973. (Journal, dated 12 Dec 72 -- 12445.) 5h

DCE 9-NOV-73 12:35 20143

Visit Log: 25 Jul 73, Dr. Stanley Taylor, Army Ballistic Research Laboratories

(J20143) 9-NOV-73 12:35; Title: Author(s): Douglas C. Engelbart/DCE ; Sub-Collections: SRI-ARC; Clerk: DCE ;

DCE 9-NOV-73 12:44 20144

Phone log: 1 November 73, Bill Park, regarding employment opportunity

Bill Park was referred to me by Dick Raymond of Portola Institute. Bill has a Ph.D. in systems engineering from the U. of Pennsylvania. His special interest is in computer graphics. He says that for the past year or so he has been heavily involved in administrative work. He would like to change. He said that he was "out in this area for a few months, and would like to find some interesting work -- even perhaps without pay." 1

I am sending the following literature to him, and am asking that if he is interested, to send his resume as the next step: 2

D. C. Engelbart, R. W. Watson, J. C. Norton, THE AUGMENTED KNOWLEDGE WORKSHOP, paper presented at the National Computer Conference, New York City, June 1973. (Journal -- 14724.) 2a

D. C. Engelbart and W. K. English. "A Research Center for Augmenting Human Intellect", AFIPS Proceedings, Fall Joint Computer Conference, 1968, Washington, D.C. (XDOC -- 3954.) 2b

D. C. Engelbart, DESIGN CONSIDERATIONS FOR KNOWLEDGE WORKSHOP TERMINALS, paper presented at the National Computer Conference, New York City, June 1973. (Journal -- 14851.) 2c

20144 Distribution
Jeanne M. Leavitt, Richard W. Watson, James C. Norton,

DCE 9-NOV-73 12:44 20144

Phone log: 1 November 73, Bill Park, regarding employment opportunity

(J20144) 9-NOV-73 12:44; Title: Author(s): Douglas C. Engelbart/DCE ; Distribution: /jml rww jcn ; Sub-Collections: SRI-ARC; Clerk: DCE ;

DCE 9-NOV-73 13:26 20145

Don't use 'keyword' to refer to a Command Term

I have been concerned with the use of the term "keyword" being used for indiviual terms comprising an NLS command, as it has come to be applied in developing the forthcoming "New NLS Command Language." 1

"Keyword" has a long history of use within ARC in our indexing -- "Key word in title." It will cause confusion within our own environment if applied anew for something as commonly spoken and written about as the NLS commands. 1a

It also is a term firmly embedded in retrieval and information-management terminology. It will be very confusing to users in these areas who get involved in developing special NLS tools for their own use, since they must then plan, design, discuss, and document new NLS commands using conventions and terminology consistent with all other AKW developers and users. 1b

I want the term "keyword" to be used in our retrieval work, in a manner compatible with its external usage in the world of information sciences; and I don't want it also used by us to refer to command terms. 2

This is a formal request. Establish a different term in our own usage, and in all of our documentation, to refer to the successive terms that specify an NLS command. 3

Candidate: "Command Term" seems appropriately explicit: a short form might be used in our tight-description documentation, "Comterm." 4

20145 Distribution

Richard W. Watson, James C. Norton, Charles H. Irby, Charles F. Dornbush, Michael D. Kudlick, Jeanne B. North, Dirk H. Van Nouhuys, Kirk E. Kelley, Jeanne M. Beck, Elizabeth K. Michael, Harvey G. Lehtman,

Don't use 'keyword' to refer to a Command Term

(J20145) 9-NOV-73 13:26; Title: Author(s): Douglas C. Engelbart/DCE
; Distribution: /rww jcn chi cfd mdk jbn dvn kirk jmb ekm hgl
; Sub-Collections: SRI-ARC; Clerk: DCE ;

JBP 9-NOV-73 13:31 20146

document request

ira:
i just noticed a few nbs reports circulating arround, and they look interesting, so could you add me to the mailing list. i am especially interested in technical notes 799 an 795, also special pub. 384 seems very useful; any thing else along those line might be interesting too. i case you dont know yet i am now at mitre, so you know thhe address but just to be clear about it

Jon Postel
The MITRE Coproation
Mail stop W185
Westgate Research Park
McLean, Virginia 22101

1

20146 Distribution
Ira W. Cotton,

JBP 9-NOV-73 13:31 20146

document request

(J20146) 9-NOV-73 13:31; Title: Author(s): Jonathan B. Postel/JBP;
Distribution: /IWC; Sub-Collections: NIC; Clerk: JBP;

MCK 9-NOV-73 13:47 20147

Jim--

I don't know whether or not you know it, but your SMFS subsystem has bug(s). Files get garbled in transfer rather badly. Could be that the only problem is in 'from UCSB' transfers, because the NEWS command prints trash, and the file <SYSTEM>smfs.news;1 is quite old and presumably was stored correctly.

Anything interesting going on at ARC? Any prediction as to how soon you'll be running te TYMSHARE machine?

--Mark

1

20147 Distribution
James E. (Jim) White,

(J20147) 9-NOV-73 13:47; Title: Author(s): Mark C. Krilanovich/MCK;
Distribution: /JEW; Sub-Collections: NIC; Clerk: MCK;
Origin: <UCSB>JEWMSG.NLS;2, 9-NOV-73 13:44 MCK ;

BAH 9-NOV-73 14:49 20148

SEP 16 - 22, 1973: A WEEK IN REVIEW

WEEKLY ANALYSIS REPORT: 1

2

WEEK: SEP 16 - 22, 1973 (24 HOURS/DAY) 3

4

TOTAL SYSTEM CPU: 65.004 5

6

(ARC) 6a

IDENT	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1	
						6a1
						6a2
(STAFF)						6a3
(JMB)	.916	45.936	.020	1.409	50.148	6a3a
(DCE)	.183	15.787	.012	.282	86.268	6a3b
(SRL)	.376	8.283	.045	.578	22.029	6a3c
(NDM)	.005	.230	.022	.008	46.000	6a3d
(JCN)	1.312	40.425	.032	2.018	30.812	6a3e
(DVN)	1.141	34.744	.033	1.755	30.450	6a3f
(PR)	.040	.973	.041	.062	24.325	6a3g
(RWW)	.022	2.457	.009	.034	111.682	6a3h
	-----	-----		-----		6a3i
TOTAL	3.995	148.835		6.146		6a3j
						6a3k
(PSO)						6a4
(JML)	.075	3.567	.021	.115	47.560	6a4a
(BAH)	.826	27.791	.030	1.271	33.645	6a4b
(MEJ)	1.307	85.876	.015	2.011	65.705	6a4c

(KIR)	.722	26.215	.028	1.111	36.309	6a4d
	-----	-----		-----		6a4e
TOTAL	2.930	143.449		4.508		6a4f
						6a4g
(NIC)						6a5
(JDC)	.023	.592	.039	.035	25.739	6a5a
(EJF)	.276	9.618	.029	.425	34.848	6a5b
(CBG)	.090	4.002	.022	.138	44.467	6a5c
(MDK)	1.186	12.415	.096	1.825	10.468	6a5d
(MLK)	.151	17.917	.008	.232	118.656	6a5e
(JBN)	.144	7.064	.020	.222	49.056	6a5f
	-----	-----		-----		6a5g
TOTAL	1.870	51.608		2.877		6a5h
						6a5i
(HARDWARE)						6a6
(RAB)	.002	.029	.069	.003	14.500	6a6a
(MEH)	.050	4.741	.011	.077	94.820	6a6b
RATLI	.009	.563	.016	.014	62.556	6a6c
(EKV)	-	-	-	-	-	6a6d
	-----	-----		-----		6a6e
TOTAL	.061	5.333		.094		6a6f
						6a6g
(TENEX)						6a7
(DIA)	.149	7.967	.019	.229	53.470	6a7a
(WRF)	.839	13.486	.062	1.291	16.074	6a7b

SEP 16 - 22, 1973: A WEEK IN REVIEW

(KEV)	.710	21.021	.034	1.092	29.607	6a7c
(DCW)	1.387	43.388	.032	2.134	31.282	6a7d
	-----	-----		-----		6a7e
TOTAL	3.085	85.862		4.746		6a7f
						6a7g
(NLS)						6a8
(CFD)	1.420	39.200	.036	2.184	27.606	6a8a
(JDH)	.528	21.236	.025	.812	40.220	6a8b
(CHI)	3.251	59.667	.054	5.001	18.353	6a8c
(DSK)	.832	20.320	.041	1.280	24.423	6a8d
(HGL)	.374	15.334	.024	.575	41.000	6a8e
(EKM)	.171	13.117	.013	.263	76.708	6a8f
(JEW)	1.229	20.078	.061	1.891	16.337	6a8g
	-----	-----		-----		6a8h
TOTAL	7.805	188.952		12.006		6a8i
						6a8j

(GROUP) TOTALS 6b

GROUP	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU	
						6b1
						6b2
(STAFF)	3.995	148.835	.027	6.146	37.037	6b3
(PSO)	2.930	143.449	.020	4.508	50.000	6b4
(NIC)	1.870	51.608	.036	2.877	27.778	6b5
(HARDWARE)	.061	5.333	.011	.094	90.909	6b6
(TENEX)	3.085	85.862	.036	1.746	27.778	6b7
(NLS)	7.805	188.952	.041	12.006	24.390	6b8

SEP 16 - 22, 1973: A WEEK IN REVIEW

TOTAL	19.746	624.039	.032	27.377

(STATS)

HIGHEST CPU: CHI 3.251 hrs LOWEST CPU: RAB .002 hrs

HIGHEST CON: MEJ 85.876 hrs LOWEST CON: RAB .029 hrs

HIGHEST CPU/CON: MDK .096 HIGHEST CON/CPU:1: RWW .009

(OVERHEAD)

BACKGROUND	1.672	136.931	.012	2.572	81.897
CAT	.003	.053	.057	.005	17.667
CATALOG	.001	.007	.143	.002	7.000
DOCB	-	-	-	-	-
DOCUMENTATION	.336	13.826	.024	.517	41.149
GILBERT	-	-	-	-	-
NETINFO	-	-	-	-	-
NIC-WORK	-	-	-	-	-
OPERATOR	.929	43.042	.022	1.429	46.332
PETERS	2.938	47.773	.061	4.520	16.260
PRINTER	6.579	141.947	.046	10.121	21.576
SYSTEM	16.709	179.144	.093	25.705	10.721
SYSTEM	1.023	114.360	.009	1.574	111.789
SYSTEM	6.871	139.521	.049	10.570	20.306

SEP 16 - 22, 1973: A WEEK IN REVIEW

TOTAL	37.061	816.604		57.015	

(XEROX)

NAME	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1
DEUTSCH	.010	.283	.035	.015	28.300
(CMG)GESCHKE	-	-	-	-	-
MITCHELL	.004	.143	.028	.006	35.750
(WHP)PAXTON	-	-	-	-	-
(EHS)SAT-WTE	.195	9.452	.021	.300	48.472
(RES)SWEET	.009	.880	.010	.014	97.778
TOTAL	.209	10.758		.335	

(RADC)

NAME	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1
BERGS	.001	.006	.167	.002	6.000
BETHK	.169	8.356	.020	.260	49.444
CAVAN	.166	9.195	.018	.255	55.392
IUORN	.015	1.544	.010	.023	102.933
KENNE	.130	8.480	.015	.200	65.231
LAMON	.186	6.004	.031	.286	32.280
LAWRE	.090	4.673	.019	.138	51.922

SEP 16 - 22, 1973: A WEEK IN REVIEW

MCNAM	.162	7.849	.021	.249	48.451	6f11
PANAR	.163	7.859	.021	.251	48.215	6f12
RADC	.035	1.805	.019	.054	51.571	6f13
RZEPK	.001	.005	.200	.002	5.000	6f14
SLIWA	.010	.695	.014	.015	69.500	6f15
STONE	.265	12.330	.021	.408	46.528	6f16
THAYE	.001	.002	.500	.002	2.000	6f17
TOMAI	.097	4.524	.021	.149	46.639	6f18
	-----	-----		-----		6f19
TOTAL	1.491	73.327		2.294		6f20
						6f21

(NETUSERS) TOP FIVE 6g

6g1

NAME	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1	
						6g3
UCLA-NMC	.681	17.540	.039	1.048	25.756	6g4
MITRE-TIP	.576	35.603	.016	.886	61.811	6g5
GUEST	.503	17.869	.028	.774	35.525	6g6
NSRDC	.479	28.298	.017	.737	59.077	6g7
UK-ICS	.467	43.848	.011	.718	93.893	6g8
	-----	-----		-----		6g9
TOTAL	2.706	143.158		4.163		6g10
						6g11

(NET) TOTAL	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1	
						6h
						6h1

SEP 16 - 22, 1973: A WEEK IN REVIEW

TOTAL		4.893	261.256		7.528	

(OTHER)	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1
BAIR	.001	.005	.200	.002	5.000
ENERGY	-	-	-	-	-
JIMB	1.444	21.609	.067	2.221	14.965
MARRAH	.001	.023	.043	.002	23.000
TOTAL	1.446	21.637		2.225	

SEP 2 - 8, 1973: A WEEK IN REVIEW

WEEKLY ANALYSIS REPORT:

WEEK: SEP 2 - 8, 1973 (24 HOURS/DAY)

TOTAL SYSTEM CPU: 40.775

(ARC)

IDENT	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1
(STAFF)					
(JMB)	.757	20.077	.038	1.857	26.522
(DCE)	.047	5.557	.008	.115	118.234
(SRL)	.266	4.366	.061	.652	16.414
(NDM)	.700	20.645	.034	1.717	29.493
(JCN)	1.352	22.361	.060	3.316	16.539
(DVN)	.152	2.902	.052	.373	19.092
(PR)	-	-	-	-	-
(RWW)	.009	.329	.027	.022	36.556
TOTAL	3.283	76.237		8.052	
(PSO)					
(JML)	.042	5.106	.008	.103	121.571
(BAH)	.734	21.689	.034	1.800	29.549
(MEJ)	.961	79.370	.012	2.357	82.591

(KIR)	.561	23.488	.024	1.376	41.868	6a4d
	-----	-----		-----		6a4e
TOTAL	2.298	129.653		5.636		6a4f
						6a4g
(NIC)						6a5
(JDC)	-	-	-	-	-	6a5a
(EJF)	.363	11.838	.031	.890	32.612	6a5b
(CBG)	.101	5.680	.018	.248	56.238	6a5c
(MDK)	.377	8.516	.044	.925	22.589	6a5d
(MLK)	.247	14.566	.017	.606	58.972	6a5e
(JBN)	.269	13.176	.020	.660	48.981	6a5f
	-----	-----		-----		6a5g
TOTAL	1.357	53.776		3.329		6a5h
						6a5i
(HARDWARE)						6a6
(RAB)	-	-	-	-	-	6a6a
(MEH)	.002	.022	.091	.005	11.000	6a6b
(JR)	-	-	-	-	-	6a6c
(EKV)	-	-	-	-	-	6a6d
	-----	-----		-----		6a6e
TOTAL	.002	.022		.005		6a6f
						6a6g
(TENEX)						6a7
(DIA)	1.158	19.667	.059	2.840	16.984	6a7a
(WRF)	.407	5.086	.080	.998	12.496	6a7b

SEP 2 - 8, 1973: A WEEK IN REVIEW

(KEV)	1.793	34.844	.051	4.397	19.433	6a7c
(DCW)	.022	.377	.058	.054	17.136	6a7d
	-----	-----		-----		6a7e
TOTAL	3.380	59.974		8.289		6a7f
						6a7g
(NLS)						6a8
(CFD)	.000	.002	.000	.000	1.000	6a8a
(CFD)	1.052	31.807	.033	2.580	30.235	6a8b
(JDH)	.384	17.748	.022	.942	46.219	6a8c
(CHI)	.678	8.607	.079	1.663	12.695	6a8d
(DSK)	.793	48.666	.016	1.945	61.369	6a8e
(HGL)	.909	26.630	.034	2.229	29.296	6a8f
(EKM)	.438	20.856	.021	1.074	47.616	6a8g
(JEW)	.619	9.346	.066	1.518	15.099	6a8h
	-----	-----		-----		6a8i
TOTAL	4.873	163.662		11.951		6a8j
						6a8k

(GROUP) TOTALS 6b

GROUP	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU	
						6b1
						6b2
(STAFF)	3.283	76.237	.043	8.052	-	6b3
(PSO)	2.298	129.653	.018	5.636	-	6b4
(NIC)	1.357	53.776	.025	3.329	-	6b5
(HARDWARE)	.002	.022	.091	.005	-	6b6
(TENEX)	3.380	59.974	.056	8.289	-	6b7

SEP 2 - 8, 1973: A WEEK IN REVIEW

(NLS)	4.873	163.662	.030	11.951	-	6b8
	-----	------		-----		6b9
TOTAL	15.193	483.324		37.262		6b10
						6b11

(STATS) 6c

HIGHEST CPU: KEV 1.793 hrs LOWEST CPU: MEH .002 hrs 6c1

HIGHEST CON: MEJ 79.370 hrs LOWEST CON: MEH .022 hrs 6c2

HIGHEST CPU/CON: MEH .091 HIGHEST CON/CPU:1: JML 121.571 6c3

6c4

(OVERHEAD) 6d

6d1

BACKGROUND	1.347	104.557	.013	3.303	77.622	6d2
CAT	4.103	9.643	.425	10.063	2.350	6d3
CATALOG	-	-	-	-	-	6d4
DOCB	-	-	-	-	-	6d5
DOCUMENTATION	.153	8.306	.018	.375	54.288	6d6
GILBERT	-	-	-	-	-	6d7
NETINFO	-	-	-	-	-	6d8
NIC-WORK	.004	.054	.074	.010	13.500	6d9
OPERATOR	1.701	31.214	.054	4.172	18.350	6d10
PETERS	-	-	-	-	-	6d11
PRINTER	4.371	104.392	.042	10.720	23.883	6d12
SYSTEM	1.007	97.256	.010	2.470	96.580	6d13
SYSTEM	.671	99.881	.007	1.646	148.854	6d14
SYSTEM	5.358	102.257	.052	13.140	19.085	6d15

SEP 2 - 8, 1973: A WEEK IN REVIEW

	-----	-----		-----	
TOTAL	18.715	557.560		45.899	

(XEROX)

NAME	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1
COWAN	.018	1.044	.017	.044	58.000
DEUTSCH	.067	2.655	.025	.154	39.627
MITCHELL	.175	3.288	.053	.429	18.789
	-----	-----		-----	
TOTAL	.260	6.987		.637	

(RADC)

NAME	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1
BAIR	.400	21.423	.019	.981	53.558
BERGS	.006	.148	.041	.015	24.667
BETHK	.032	1.210	.026	.078	37.813
CAVAN	.132	8.315	.016	.324	62.992
IUORN	.013	.553	.024	.032	42.538
KENNE	.202	13.497	.015	.495	66.817
LAMON	.076	.953	.080	.186	12.539
LAWRE	.059	3.980	.015	.145	67.458
MCNAM	.028	1.279	.022	.069	45.679

PANAR	.233	8.405	.028	.571	36.073	6f13
RADC	.031	1.206	.026	.076	38.903	6f14
SLIWA	.016	.489	.033	.039	30.563	6f15
STONE	.296	14.362	.021	.726	48.520	6f16
TOMAI	.075	3.355	.022	.184	44.733	6f17
	-----	-----		-----		6f18
TOTAL	1.599	79.175		3.921		6f19
						6f20

(NETUSERS) TOP FIVE 6g

6g1

NAME	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1	
						6g3
MITRE-TIP	.826	43.594	.019	2.026	52.777	6g4
USC	.564	9.570	.059	1.383	16.968	6g5
UCSB	.396	16.071	.025	.971	40.583	6g6
UCLA-NMC	.389	17.353	.022	.954	44.609	6g7
HELP	.334	22.283	.015	.819	66.716	6g8
	-----	-----		-----		6g9
TOTAL	2.509	108.871		6.153		6g10
						6g11

(NET) TOTAL	CPU HRS	CON HRS	CPU/CON	% SYS	
					6h1
TOTAL	3.882	195.615	.020	9.278	6h2
					6h3

(OTHER)	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1

SEP 2 - 8, 1973: A WEEK IN REVIEW

						611
BAIR	.400	21.423	.019	.981	53.558	612
DUVALL	.001	.382	.003	.002	382.000	613
ENERGY	-	-	-	-	-	614
JIMB	.224	3.944	.057	.549	17.607	615
MARRAH	-	-	-	-	-	616
	-----	-----		-----		617
TOTAL	.625	25.749		1.532		618
						619
						7

20149 Distribution

Susan R. Lee, Beauregard A. Hardeman, Douglas C. Engelbart, Don I. Andrews, 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,

BAH 9-NOV-73 14:52 20149

SEP 2 - 8, 1973: A WEEK IN REVIEW

(J20149) 9-NOV-73 14:52; Title: Author(s): Beauregard A. Hardeman/BAH; Distribution: /WAR; Sub-Collections: SRI-ARC WAR; Clerk: BAH;

BAH 9-NOV-73 15:02 20150

SEP 23 - 29, 1973: A WEEK IN REVIEW

WEEKLY ANALYSIS REPORT:

WEEK: SEP 23 - 29, 1973 (24 HOURS/DAY)

TOTAL SYSTEM CPU: 54.850

(ARC)

IDENT	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1
(STAFF)					
(JMB)	.319	11.263	.028	.582	35.307
(DCE)	.131	4.052	.032	.239	30.931
(SRL)	.237	11.964	.020	.432	50.481
(NDM)	.237	10.904	.022	.432	46.008
(JCN)	1.096	23.502	.047	1.998	21.443
(DVN)	.725	21.564	.034	1.322	29.743
(PR)	.107	4.070	.026	.195	38.037
(RWW)	.093	2.814	.033	.170	30.258
	-----	-----		-----	
TOTAL	2.945	90.133		5.370	
(PSO)					
(JML)	.185	10.627	.017	.337	57.443
(BAH)	1.219	26.628	.046	2.222	21.844
(MEJ)	1.171	89.540	.013	2.135	76.465

SEP 23 - 29, 1973: A WEEK IN REVIEW

(KIR)	1.054	37.303	.028	1.922	35.392	6a4d
	-----	-----		-----		6a4e
TOTAL	3.629	164.098		6.616		6a4f
						6a4g
(NIC)						6a5
(JDC)	.074	2.872	.026	.135	38.811	6a5a
(EJF)	.497	7.859	.063	.906	15.813	6a5b
(CBG)	.073	2.980	.024	.133	40.822	6a5c
(MDK)	.516	10.770	.048	.941	20.872	6a5d
(MLK)	.170	9.354	.018	.310	55.024	6a5e
(JBN)	.939	35.140	.027	1.712	37.423	6a5f
	-----	-----		-----		6a5g
TOTAL	2.269	68.975		4.137		6a5h
						6a5i
(HARDWARE)						6a6
(RAB)	.026	1.317	.020	.047	50.654	6a6a
(MEH)	.082	1.405	.058	.149	17.134	6a6b
(JR)	-	-	-	-	-	6a6c
(EKV)	-	-	-	-	-	6a6d
	-----	-----		-----		6a6e
TOTAL	.108	2.722		.196		6a6f
						6a6g
(TENEX)						6a7
(DIA)	.100	15.917	.006	.182	159.170	6a7a
(WRF)	2.223	29.051	.077	4.053	13.068	6a7b

SEP 23 - 29, 1973: A WEEK IN REVIEW

(KEV)	1.162	28.103	.041	2.119	24.185	6a7c
(DCW)	2.151	42.762	.050	3.922	19.880	6a7d
	-----	-----		-----		6a7e
TOTAL	5.636	115.833		10.276		6a7f
						6a7g
(NLS)						6a8
(CFD)	1.629	43.719	.037	2.970	26.838	6a8a
(JDH)	.096	4.452	.022	.175	46.375	6a8b
(CHI)	1.538	30.914	.050	2.804	20.100	6a8c
(DSK)	.639	16.159	.040	1.165	25.288	6a8d
(HGL)	.304	9.347	.033	.554	30.747	6a8e
(EKM)	.289	10.995	.026	.527	38.045	6a8f
(JEW)	1.693	45.961	.037	3.087	27.148	6a8g
	-----	-----		-----		6a8h
TOTAL	6.188	161.547		11.282		6a8i
						6a8j

(GROUP) TOTALS 6b

GROUP	CPU HRS	CON HRS	CPU/CON	% SYS	
					6b1
					6b2
(STAFF)	2.945	90.133	.033	5.370	6b3
(PSO)	3.629	164.098	.022	6.616	6b4
(NIC)	2.269	68.975	.033	4.137	6b5
(HARDWARE)	.108	2.722	.040	.196	6b6
(TENEX)	5.636	115.833	.049	10.276	6b7
(NLS)	6.188	161.547	.038	11.282	6b8

SEP 23 - 29, 1973: A WEEK IN REVIEW

	-----	------		-----		6b9
TOTAL	20.775	603.308		37.877		6b10
						6b11
(STATS)						6c
HIGHEST CPU: WRF 2.223 hrs			LOWEST CPU:	RAB .026 hrs		6c1
HIGHEST CON: MEJ 89.540 hrs			LOWEST CON:	RAB 1.317 hrs		6c2
HIGHEST CPU/CON: WRF .077			HIGHEST CON/CPU:1: DIA 159.170			6c3
						6c4
(OVERHEAD)						6d
						6d1
BACKGROUND	2.425	93.155	.026	4.421	38.414	6d2
CAT	-	-	-	-	-	6d3
CATALOG	-	-	-	-	-	6d4
DOCB	-	-	-	-	-	6d5
DOCUMENTATION	.398	14.218	.028	.726	35.724	6d6
GILBERT	-	-	-	-	-	6d7
NETINFO	.273	8.396	.033	.498	30.755	6d8
NIC-WORK	-	-	-	-	-	6d9
OPERATOR	2.396	39.617	.060	4.353	16.535	6d10
PETERS	2.428	57.602	.042	4.427	23.724	6d11
PRINTER	7.745	129.598	.060	14.120	16.733	6d12
SYSTEM	1.405	129.595	.011	2.562	92.238	6d13
SYSTEM	.668	127.364	.005	1.218	190.665	6d14
SYSTEM	6.686	128.294	.052	12.190	19.188	6d15
	-----	-----		-----		6d16

SEP 23 - 29, 1973: A WEEK IN REVIEW

TOTAL	24.424	727.839		44.530		6d17
(XEROX)						6e
						6e1
NAME	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1	6e2
						6e3
(LPD)DEUTSCH	-	-	-	-	-	6e4
GESCHKE	.006	.607	.010	.011	101.167	6e5
MITCHELL	.098	4.500	.022	.179	45.918	6e6
(WHP)PAXTON	-	-	-	-	-	6e7
(EHS)SAT-WTE	.167	9.358	.018	.304	56.036	6e8
SWEET	.015	1.149	.013	.027	76.600	6e9
	-----	-----		-----		6e10
TOTAL	.286	15.614		.521		6e11
						6e12
(RADC)						6f
						6f1
NAME	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1	DIR 6f2
						6f3
BERGS	.062	3.142	.020	.113	50.677	6f4
BETHK	.198	10.910	.018	.361	55.101	6f5
CAVAN	.233	45.866	.005	.425	196.850	6f6
IUORN	.064	3.928	.016	.117	61.375	6f7
KENNE	.202	12.180	.017	.368	60.297	6f8
LAMON	.465	41.094	.011	.848	88.374	6f9
LAWRE	.112	6.172	.018	.204	55.107	6f10

SEP 23 - 29, 1973: A WEEK IN REVIEW

MCNAM	.015	.648	.023	.027	43.200	6f11
PANAR	.223	21.831	.010	.407	97.897	6f12
RADC	.010	.419	.024	.018	41.900	6f13
SLIWA	.004	.120	.033	.007	30.000	6f14
STONE	.290	12.353	.023	.529	42.597	6f15
TOMAI	.147	7.617	.019	.268	51.816	6f16
	-----	-----		-----		6f17
TOTAL	2.025	166.280		3.692		6f18
						6f19

(NETUSERS) TOP FIVE 6g

6g1

NAME	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1	
						6g3
MITRE-TIP	1.049	62.076	.017	1.912	59.176	6g4
GUEST	1.008	38.684	.026	1.838	38.377	6g5
TORBETT	.958	13.173	.073	1.747	13.751	6g6
UCSB	.474	12.909	.037	.854	27.234	6g7
NSRDC	.239	10.653	.022	.436	44.573	6g8
	-----	-----		-----		6g9
TOTAL	3.728	137.495		6.797		6g10
						6g11

(NET) TOTAL	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1	
						6h1
TOTAL	6.595	273.962		12.025		6h2
						6h3

SEP 23 - 29, 1973: A WEEK IN REVIEW

(OTHER)	CPU HRS	CON HRS	CPU/CON	% SYS	CON/CPU:1
JIMB	.701	9.247	.076	1.278	13.191
MARRAH	.002	.070	.029	.004	35.000
TOTAL	.703	9.317		1.282	

20150 Distribution

Susan R. Lee, Beauregard A. Hardeman, Douglas C. Engelbart, Don I. Andrews, 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,

BAH 9-NOV-73 15:02 20150

SEP 23 - 29, 1973: A WEEK IN REVIEW

(J20150) 9-NOV-73 15:02; Title: Author(s): Beauregard A. Hardeman/BAH; Distribution: /WAR; Sub-Collections: SRI-ARC WAR; Clerk: BAH;

JHB 9-NOV-73 16:13 20151

New and renamed directories for RADC.

Now you can use sndmsg and Journal to communicate by he correct name and ident (see goto ident submode).

JHB 9-NOV-73 16:13 20151

New and renamed directories for RADC.

A new directory has been created for Ed Laforge and the dirs for Bethke and Sliwa have been renamed to Daughtry and Liuzzi respectively. In order to complete the renamiing process, the original dirs had to be destroyed and new dirs created under thenew names. This is a complex process that involves file transfer problem and consequently the contents of the old dirs will not be completely restored until Tues.,13 Nov. although the process actually began on Thurs., 8 Nov. When completed all the files from Bethke should be in Daughtry, and the same for Sliwa to Liuzzi. 1

20151 Distribution

Larry M. Lombardo, Anna A. Cafarelli, Roberta J. Carrier, Donna R. Robilotta, David L. Daughtry, Richard H. Thayer, Frank J. Tomaini, Mike A. Wingfield, Edmund J. Kennedy, Ray A. Liuzzi, Richard Calicchia, John W. Johnson, Donald Van Alstine, Dean F. Bergstrom, William P. Bethke, Frank S. LaMonica, William E. Rzepka, Rocco F. Iuorno, Frank P. Sliwa, Thomas J. Bucciero, Robert E. Doane, David A. Luther, Roger B. Panara, John L. McNamara, Joe P. Cavano, Duane L. Stone, Marcelle D. Petell, Josephine R. Stellato, Robert K. Walker, Thomas F. Lawrence, James H. Bair, James C. Norton, Dirk H. Van Nouhuys, Jeffrey C. Peters,

JHB 9-NOV-73 16:13 20151

New and renamed directories for RADC.

(J20151) 9-NOV-73 16:13; Title: Author(s): James H. Bair/JHB;
Distribution: /RADC JCN(FYI) DVN(FYI) JCP; Sub-Collections: SRI-ARC
RADC; Clerk: JHB;

some 1-10 q's.

Dean -- Does the content analyzer (user programs) allow you to save info, from one statment to the next? E.g., can I compare the stid of the current statement with the previous one??

2) What is the format of info in <nls>sysgd?
seems to be: procname (parms) (parms)
its the two parms that are unclear to me. Maybe the first is a list of procedures/variables accessed?

I gather ALL nls commands (e.g., delete statement) can be used simply by accessing their core procedure (e.g., cis, for insert statment)?

Dave.

20152 Distribution
N. Dean Meyer,

some 1-10 q's.

(J20152) 9-NOV-73 16:21; Title: Author(s): David H. Crocker/DHC;
Distribution: /NDM; Sub-Collections: NIC; Clerk: DHC;

Brief Analysis of the On-line Calculator

INTRODUCTION

The following measurements were collected over the past month to give an indication of the cost of using the on-line calculator.

DATA

	TNLS	DNLS
	(in seconds)	
1. Getting into calculator	1.8	1.9
2. Entering number	.33	.58
3. List accumulators	.55	1.7
It appeared to make no difference how many accumulators were non-zero.		
4. Total	.2	.3
5. Clear Accumulator	.2	.4
6. Adding	.23	.48
7. Subtracting	.3	.52
8. Multiplying	.27	.55
9. Dividing	.33	.5
10. Format	.45	.7
11. Format Feedback Abbreviated	.2	N/A
Operations conducted while in this mode take the same CPU as in regular mode*		
12. Operation with value from accumulator	.3	.5
13. Use accumulator	.17	.52
14. Value of expression**	.5	.8

* An operation is one computation such as division, subtraction, etc. 2q

** An expression is a combination of numbers and operations 2r

CONCLUSIONS 3

The calculator appears to be relatively efficient and especially useful when used in conjunction with other NLS tasks. For example, if the raw data which is to be manipulated is already in a file, it is much easier to do computations on-line using the calculator rather than doing them off-line and then later transferring the new data into a file. 3a

The difference in CPU needed for using the calculator in DNLS and TNLS is rather small in comparison to other tasks which have been measured, such as text insertion. The difference is approximately a factor of two and considering the ease of bugging rather than addressing a number, this difference is not significant. 3b

There seems to be no significant difference in the amount of CPU needed to conduct similar computations with full feedback or abbreviated feedback in TNLS. However, abbreviated feedback in TNLS produces a response time which seemed roughly equivalent to working either in DNLS or with a standard desk calculator. 3c

4

20153 Distribution

Donald C. (Smokey) Wallace, Richard W. Watson, Don I. Andrews, A. Jim Blum, A. Analysis, Meredith(Reddy) E. Dively, 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

Brief Analysis of the On-line Calculator

(J20153) 9-NOV-73 16:49; Title: Author(s): Susan R. Lee/SRL;
Distribution: /SRI-ARC; Sub-Collections: SRI-ARC; Clark: SRL;
Origin: <LEE>CALC.NLS;5, 9-NOV-73 16:47 SRL ;

Results of Command Frequency Study

INTRODUCTION 1

The automatic DNLS command frequency collection mechanism was instituted between October 22 and 26. A description of this mechanism as well as previously collected data may be found in Jacque Vallee's "THE DNLS COMMAND LANGUAGE MONITOR" (14170,). 1a

Command frequency data had not previously been collected for a period longer than one day.The data collected over a week's time should be a good basis for a beginning look at command usage and is presented in various forms below. 1b

TOTALS FOR VARIOUS COMMANDS 2

There were 10814 commands issued over the five day period divided among 134 different commands. The following tables show this distribution. 2a

	Exec	Frez	Goto	Jump	Load	Outp	Updt
a	16	21	-	17	-	6	-
b	3	-	-	41	-	-	-
c	1	-	34	240	-	17	-
d	26	-	220	29	-	57	-
e	-	-	39	18	-	-	-
f	11	-	-	225	189	18	-
h	-	-	-	50	-	-	-
i	5	-	-	1401	-	-	-
j	27	-	-	425	-	-	-
l	96	-	-	495	3	-	-
m	6	-	3	-	-	-	-
n	24	-	3	35	-	-	277
o	4	-	-	254	-	-	195
p	-	-	98	166	-	-	-
q	29	-	-	-	-	166	-
r	1	5	-	189	-	-	-
s	77	5	16	352	-	8	-
t	2	-	-	81	-	-	-
u	27	-	2	187	-	-	-

2a1

	brn	chr	grp	inv	lnk	num	plx	sta	tex	vis	wrd	tot
copy	78	44	37	2	3	3	31	133	48	20	13	-
delt	96	316	85	4	5	2	20	196	199	49	84	-
inst	1	562	31	1	3	-	-	492	71	56	127	-
move	105	34	74	1	5	1	34	104	37	6	20	-
repl	7	282	23	6	2	54	14	49	296	88	350	-
subs	-	2	-	1	1	2	-	-	32	1	14	-
trsp	3	17	3	-	-	-	-	10	18	2	17	-
xset	-	17	1	-	1	1	-	8	2	1	10	-

Results of Command Frequency Study

TOT - - - - - - - - - - - - -

appd 62
brek 83
null 39
quit 64
vspc 56 2a2

COMMANDS LISTED IN ORDER OF USAGE 3

COMMAND	FREQUENCY	PERCENTAGE	CUM-PERCENTAGE	3a
Jump Item	1401	13	13	3b
Insert Character	562	6	19	3c
Jump Link	495	5	24	3d
Insert Statement	492	5	29	3e
Jump Jump*	425	4	24	3f
Jump Successor	352	4	37	3g
Replace Word	350	4	41	3h
Delete Character	316	3	44	3i
Replace Text	296	3	47	3j
Replace Character	282	3	50	3k
Update New	277	3	53	3l
Jump Origin	254	3	56	3m
Jump Content	240	3	59	3n
Jump File	225	2	61	3o
Goto Display	220	2	63	3p
Delete Text	199	2	65	3q
Delete Statement	196	2	67	3r
Update Old	195	2	69	3s

Results of Command Frequency Study

Load File	189	2	71	3t
Jump Return	189	2	73	3u
Jump Up	187	2	75	3v
Jump Predecessor	166	2	77	3w
Output Quickprint	166	2	79	3x
Copy Statement	133	2	81	3y
Insert Word	127	2	83	3z
Move Branch	105	1	84	3a@
Move Statement	104	1	85	3aa

*The frequency of a user typing "JJ" indicates the number of times a user was in the Jump mode and retyped "Jump" unnecessarily. "JJ's" account for 10% of the Jump commands. 3aa1

COMMAND USAGE BY CATEGORY 4

Commands were divided into 13 functional categories to determine usage patterns from that viewpoint. A list of commands in each category may be found in the Appendix. 4a

CATEGORY	NUMBER	PERCENTAGE	
Jumping	4205	39	4a2
Text Editing	3642	34	4a3
File Manipulation	853	8	4a4
Text Creation	836	8	4a5
Structure Editing	333	3	4a6
Viewing	279	2	4a7
Leaving NLS	228	2	4a8
Printing	223	2	4a9
Programming	124	1	4a10
Calculator	34	The last	4a11

Results of Command Frequency Study

Terminal Manipulation	28	four categories	4a12
Journal	27	account for 1%.	4a13
Use Measurements	2		4a14
	-----	---	4a15
TOTAL	10814	100%	4a16

Results of Command Frequency Study

Use Measurements - Goto Use Measurements 5a13

20154 Distribution

Donald C. (Smokey) Wallace, Richard W. Watson, Don I. Andrews, Duane L. Stone,
A. Jim Blum, A. Analysis, Meredith(Reddy) E. Dively, 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

SRL 9-NOV-73 16:53 20154

Results of Command Frequency Study

(J20154) 9-NOV-73 16:53; Title: Author(s): Susan R. Lee/SRL;
Distribution: /SRI-ARC DLS; Sub-Collections: SRI-ARC; Clerk: SRL;
Origin: <LEE>FREQ.NLS;3, 9-NOV-73 10:02 SRL ;

JI 9-NOV-73 18:33 20155

ARPANET Newsletter - New Column

Pren: I have taken some great liberties with the article you sent from the publication "The Console" to form the article you can find and read in the file <help>humanities.nls. I hope you like it...I am going to start a new series in the Newsletter, as you will see, using your article to launch it.

If you have any objections, please let me know by the 16th of November. Otherwise, I will include it in the on-line update and in the Hard-copy issue of the December 1973 issue of the newsletter.

Pren, I sincerely appreciate your interest and contribution to the ARPANET Newsletter, and look forward to a long term dialog relative to your fine work.

Very warmest regards, ...Jean

1

20155 Distribution

Douglas C. Engelbart, Jeanne B. North, Prentiss H. Knowlton, Mil E. Jernigan, Jonathan B. Postel, Ernest H. Forman, Nancy J. Neigus, David H. Crocker, Jim O. Calvin, Steve D. Crocker,

JI 9-NOV-73 18:33 20155

ARPANET Newsletter - New Column

(J20155) 9-NOV-73 18:33; Title: Author(s): Jean Iseli/JI;
Distribution: /DCE (hope you like it Doug) JBN PHK(thanks Pren) MEJ JBP
EHF NJN DHC JOC(another goodie) SDC2(hope you approve Steve); Keywords:
COMPUTER=CONTROLLED=ORGAN-NEWSLETTER; Sub-Collections: NIC; Clerk: JI;

JI 10-NOV-73 05:55 20156

Goup Creation

Dave: Pursuant to DCE's suggestion that we journalize I-Colony dialog, I attempted to create an I-Colony group in your ident system. Each time I attempted to enter the name I-Colony and myself as coordinator, the cryptic message "exceed capacity" was received. So, I decided to abbreviate it to IC and inserted two members as a test, leaving my identity out so that the system would do what the manual say's it does; namely automatically insert my membership as group coordinator. Unfortunately, this did not happen, and since a day has passed, I am of the opinion that it may not happen. Could you please shed some light on this for me? 1

20156 Distribution

Mil E. Jernigan, Jim O. Calvin, Jonathan B. Postel, J. D. Hopper, James C. Norton, Douglas C. Engelbart, Richard W. Watson,

JI 10-NOV-73 07:28 20157

Invitation to help the ARPANET Newsletter

Dave: Now that the nitty picky stuff has been ironed out, and the ARPANET Newsletter seems to be on a routine schedule and broadening its interests, wondered if maybe you could give your affirmative consideration in becomming an associate editor for it. I believe your natural inclinations and interests would add a very valuable perspective to the Newsletter and that you could make some very important contributions to its on-going viability and evolving utility to the ARPANET user community.

I would be very pleased to have you answer yes and would very much invite your dialog. If you have a few spare moments sometimes, why not link to me at the NIC, and we can link to Mil, and explore some of the ideas we are considering for future issues. 1

JI 10-NOV-73 07:28 20157

Invitation to help the ARPANET Newsletter

(J20157) 10-NOV-73 07:28; Title: Author(s): Jean Iseli/JI;
Keywords: arpanetnewsletter-staff-addition-request; Sub-Collections:
NIC; Clerk: JI;

JI 10-NOV-73 07:39 20158

Info. to ARPANET Newsletter Staff.

Jeanne, Mil, Susan: To further improve the quality, breadth, and scope of the newsletter and provide a broader viewpoint, I have invited Dave Crocker, DHC, to join us as an Associate Editor. The message I sent to Dave can be found as (20157,). 1

20158 Distribution
Jeanne B. North, Mil E. Jernigan, Susan S. Poh, David H. Crocker,

JI 10-NOV-73 05:43 20159

comment on (20039)

I would like to commend the following to you as a most provacative and thought provoking commentary: <LJOURNAL>20039.nls;1, or if you prefer, (20039,). I find that I share many of Smokey's thoughts although in a different environment and possibly context. An desire for dialog in this area would be most welcome, after all, it could be said that man's greatest technological strides have been made in such as Smokey's "BREAKTHROUGH" environment. 1

20159 Distribution
Ernest H. Forman, Jonathan B. Postel, Jim O. Calvin, Mil E. Jernigan,

AAM 12-NOV-73 10:35 20170

Scheduled Software Maintenance

This is a reminder that Network Software Maintenance is scheduled between the hours of 0700 and 0900 (Eastern Time) on Tuesday, 13 November 1973. Although software releases are checked out as much as possible in the BBN test cell, thre are sometimes problems of scale which are not detected until after a release; hence there is a small but finite possibility that the software will be troublesome for a few hours after the scheduled release.

Sincerely,

Alex McKenzie (for the Network Control Center)

1

20170 Distribution

Larry M. Lombardo, Anna A. Cafarelli, Roberta J. Carrier, Donna R. Robilotta, David L. Daughtry, Richard H. Thayer, Frank J. Tomaini, Mike A. Wingfield, Edmund J. Kennedy, Ray A. Liuzzi, Richard Calicchia, John W. Johnson, Donald Van Alstine, Dean F. Bergstrom, William P. Bethke, Frank S. LaMonica, William E. Rzepka, Rocco F. Iuorno, Frank P. Sliwa, Thomas J. Bucciero, Robert E. Doane, David A. Luther, Roger B. Panara, John L. McNamara, Joe P. Cavano, Duane L. Stone, Marcelle D. Petell, Josephine R. Stellato, Robert K. Walker, Thomas F. Lawrence, James H. Bair,

JI 12-NOV-73 14:06 20172

ARPANET Newsletter November u1

Jeanne: Please insert (help,december-inserts,1) and
(help,december-inserts,2) [(tenex) and (forum)], in u1 of the
November on-line Newsletter. Thanks, Jean

1

20172 Distribution
Jeanne B. North, Mil E. Jernigan, Susan S. Poh,

SRL 12-NOV-73 13:43 20173

What is Analrsis Going to do about the Utility?

You guys may already have talked about this, I was just curious

What is Analrsis Going to do about the Utility?

INTRODUCTION 1

I don't know what your thoughts are on this, but it seems to me that some analysis should be made of the utility user's use of the system. 1a

I think particularly after a period of maybe 6 months is up, questions will arise about renewing contracts etc. and it might be nice to anticipate some of them. 1b

Also, there are probably a few areas that can be analyzed well only with information collected from the beginning. 1c

For these reasons, I think we should make some plans now with the future in view. 1d

A FEW IDEAS 2

A few immediate ideas include: 2a

Gathering some background information such as: 2a1

Previous and proposed use of NLS 2a1a

Projects they are involved in 2a1b

How they spend their time (% research, % editing, etc) 2a1c

Set up a log for problems 2a2

Should be easily accessible possibly with more than one alternative (sndmsg, journal, an actual file, etc.) 2a2a

Measure attitudes toward using NLS before and after 2a3

Profiles of individual users interaction within NLS 2a4

These are just a few rough ideas that certainly need expansion, maybe deletion etc. 2b

20173 Distribution
James H. Bair, James C. Norton, Paul Rech,

DHC 12-NOV-73 14:41 20174

Archive lsitings briefer

I am really glad to see the Archive stuff getting polished. a VERY strong request, tho, is to make the printing of what tapes thefiles are on OPTIONAL (default to DON'T print). If the Archive system works properly, the user doesn't actuallyever need to know the the tape numbers.

And it will greatly speed up the listing process. (Dave.) 1

20174 Distribution
Kenneth E. (Ken) Victor, Nps Np, Richard W. Watson, Charles H. Irby,

DHC 12-NOV-73 14:47 20175

newletter editing

Jean -- thanks for the offer. Please clarify what the expectations of me would be? (I am very tight for time). D/ 1

20175 Distribution
Jean Iseli,

JHB 12-NOV-73 15:12 20176

Suggestion for New NLS Consistancy

This is a rough idea of what I think is an important decision yet to be made about New NLS conventions. We should meet on a joint position?

JHB 12-NOV-73 15:12 20176

Suggestion for New NLS Consistancy

LOCATION AFTER MOVE, COPY, etc: 1

The marker in TNLS or the display in DNLS should remain in the same area, as close as possible to the original position, that it was at the beginning of the particular command. This is based on the observation that a user very rarely wishes to move with his textual entitiy to the new location but rathher wishes to remain in the same file and position to continue the editing /manipulation that he had underway at the time. 1a

In addition, it is psychologically more sound to require a positive action to change the position of the marker or display rather than having it drastically changed by an editing command. 1b

20176 Distribution
James C. Norton, Dirk H. Van Nouhuys,

EJK 12-NOV-73 15:16 20177

test message for demonstration purposes

This is a test to demonstrate the Journal system. The file that was transmitted is one of my files that is really a set of viewgraphs to be used in a presentation. It was entered into the JournalSystem from the NLS system. It wa done at about 1810 on 12 Nov. It went from my terminal through the tip to the arpanet to sri and will come back on request the same was. It is automatically indexed and stored and will remain on-line for about a month if it is not accessed. It will be available off-line at any later date. Access is usually within a few minutes, and other work can continue while waiting for it.

EJK 12-NOV-73 15:16 20177

test message for demonstration purposes

.pbs;VIEWGRAPH ONE 1

THE ROME AIR DEVELOPMENT CENTER MANAGEMENT INFORMATION SYSTEM 1a

PURPOSE 1a1

ACTIVITIES 1a2

PRESENT SYSTEM 1a3

CAPABILITIES 1a3a

COST 1a3b

DEFICIENCIES 1a3c

PROPOSED SYSTEM 1a4

.pbs;VIEWGRAPH TWO 2

THE PURPOSE OF THE ROME AIR DEVELOPMENT CENTER MANAGEMENT INFORMATION SYSTEM 2a

TO DEVELOP AND MAKE AVAILABLE TO ALL LEVELS OF OPERATIONS AND MANAGEMENT A DATA BASE OF ACCURATE INFORMATION ON THE STATE OF THINGS 2a1

TO REDUCE THE DRUDGERY OF DAY TO DAY OPERATIONS 2a2

TO REDUCE THE NEED FOR FORMAL REPORTING PROCEDURES 2a3

GENERATING FORMAL REPORTS 2a3a

READING REPORTS 2a3b

FILING REPORTS 2a3c

TO INCREASE THE EFFICIENCY OF COMMUNICATIONS 2a4

TIME 2a4a

ACCOUNTING 2a4b

FILING 2a4c

TO INCREASE THE SPEED AND SENSITIVITY OF FEEDBACK ON MANAGEMENT DECISION 2a5

test message for demonstration purposes

TO ALLOW RAPID INTELLIGENT RESPONSE TO EXTERNALLY GENERATED 'PANIC' SITUATIONS 2a6

.pbs;VIEWGRAPH THREE 3

SAMPLE ACTIVITIES 3a

CORPORATE REVIEW 3a1

PMS VARIANCE ANALYSIS 3a2

CONTRACT STATUS REPORTS 3a3

TPO'S 3a4

TRAVEL 3a5

MASIS INPUTTING 3a6

.pbs;VIEWGRAPH FOUR 4

THE PRESENT SYSTEM 4a

MIX OF MANUAL AND AUTOMATED 4a1

MANUAL 4a2

OF A TOTAL OF 1420 PEOPLE IN RADC 613 ARE IN STAFF 4a2a

PLUS LINE MANAGERS AND SUPERVISIORS 4a2b

PLUS SOME S & E TIME SPENT IN SUPPORT OF STAFF 4a2c

USING; TELEPHONE, PENCIL, PAPER, TYPEWRITER, FILE TRANSFER 4a2c1

AUTOMATED 4a3

CONTRACTS MANAGEMENT SYSTEM 4a3a

PURCHASE REQUEST MANAGEMENT SYSTEM 4a3b

FEMIS 4a3c

MASIS 4a3d

.pbs;VIEWGRAPH FIVE 5

DEFICIENCIES OF THE CURRENT ROME AIR DEVELOPMENT CENTER MANAGEMENT INFORMATION SYSTEM 5a

UNRESPONSIVE 5a1

LIMITED QUERY CAPABILITY, TOO SPECIALIZED 5a1a

INACCURATE 5a2

CONTRADICTORY 5a3

AFTER THE FACT 5a4

COSTLY - PERSONNEL WASTEFUL 5a5

.pbs;VIEWGRAPH SIX 6

TYPES OF DATA 6a

STRUCTURED 6a1

PURCHASE REQUESTS 6a1a

CONTRACTS 6a1b

TRAVEL 6a1c

PERSONNEL 6a1d

RESOURCES 6a1e

UNSTRUCTURED 6a2

LETTERS 6a2a

MEMOS 6a2b

REPORTS 6a2c

TPO'S 6a2d

.pbs;VIEWGRAPH SEVEN 7

WHAT IS DONE WITH DATA 7a

COLLECT 7a1

STORE 7a2

MODIFY 7a3

FORMAT 7a4

COMMUNICATE 7a5

TRANSFORM INTO INFORMATION 7a6

.pbs;VIEWGRAPH EIGHT 8

THE PROPOSED ROME AIR DEVELOPMENT CENTER MANAGEMENT INFORMATION SYSTEM 8a

AKW TECHNOLOGY - SPONSORED BY ARPA DEVELOPED BY STANFORD RESEARCH INSTITUTE AND USED BY ISI 8a1

IDS - DEVELOPED AND BEING DEVELOPED BY HONEYWELL - USED BY ISI 8a2

ARPA NET CAPABILITES 8a3

.pbs;VIEWGRAPH NINE 9

THE PROPOSED ROME AIR DEVELOPMENT CENTER MANAGEMENT INFORMATION SYSTEM WILL PROVIDE 9a

AN EVOLVING SYSTEM WITH IMMEDIATE CAPABILITY AND NO LIMIT ON EXPANSION CAPABILITY 9a1

MINIMAL RISK 9a2

MAXIMUM BENEFIT 9a3

HORIZONTAL AND VERTICAL EXPANDIBILITY 9a4

20177 Distribution
Duane L. Stone, Edmund J. Kennedy,

JDH 12-NOV-73 15:25 20178

Regarding your Ident system and Journal Subcollection questions

Regarding subcollections, any group is a valid ident for the subcollection field. There is no further use of this field by the system except that some our catalog producing programs use filters on this field. I'm pretty sure noone is making any effort here to coordinate the usage of subcollections system wide. About the only other thing I know about subcollections is that the default setting at submission time depends on the author and distribution list. Regarding group coordinator-membership problem. I think the documentation is wrong about coordinators automatically being included in the membership. I've looked in the system listings and see nothing like that. Your "exceed capacity" trouble may be due to too long and ident (I wasn't aware of such a restriction on group names) or it might be related to the system disaster we suffered Saturday morning.

20178 Distribution
Jean Iseli,

20179 Distribution

Larry M. Lombardo, Anna A. Cafarelli, Roberta J. Carrier, Donna R. Robilotta, David L. Daughtry, Richard H. Thayer, Frank J. Tomaini, Mike A. Wingfield, Edmund J. Kennedy, Ray A. Liuzzi, Richard Calicchia, John W. Johnson, Donald Van Alstine, Dean F. Bergstrom, William P. Bethke, Frank S. LaMonica, William E. Rzepka, Rocco F. Iuorno, Frank P. Sliwa, Thomas J. Bucciero, Robert E. Doane, David A. Luther, Roger B. Panara, John L. McNamara, Joe P. Cavano, Duane L. Stone, Marcelle D. Petell, Josephine R. Stellato, Robert K. Walker, Thomas F. Lawrence, James H. Bair,

JDH 12-NOV-73 16:10 20180

NLS system directories on the Utility

FERG, 1

I just wanted to be sure whe get the following NLS system directories on the Utility. 1a

JOURNAL 1a1

NLS 1a2

NIC-NLS 1a3

AJOURNAL-MJOURNAL 1a4

TEJOURNAL 1a5

OUTJOURNAL 1a6

DUVALL 1a7

BACKGROUND 1a8

DOCUMENTATION 1a9

REL-NLS 1a10

The first three, JOURNAL, NLS, and NIC-NLS should have the same directory numbers as on ARC machine if at all possible. 1b

I've never run BSYS, but we may save a lot of trouble for the operators if we make AJOURNAL-MJOURNAL the same too. 1c

20180 Distribution
Ferg R. Ferguson,

JI 12-NOV-73 18:29 20181

Response to DHC (20175,)

Dave:

The following list represents possible areas where your assistance would be well appreciated.

(1) Help establish better editorial policy.
(2) Help identify, isolate, and obtain newsworthy items on a timely basis.
(3) Assist in establishing the future direction of the newsletter.
(4) Assist in developing techniques for more routine flow of information from network sites to the newsletter.
(5) Assist in suggesting possible future articles and follow-up for their production.
(6) Possibly assuming responsibility for news coverage in given areas of interest.

As you know, the Newsletter is still in its formulative period. For the past few months we have been successful in keeping to a schedule and have experimented with some new approaches [ie: on-line interview follow-up on articles, abstract corner, etc.] We are constantly looking for ways to improve its quality and to make it more informative of network "happenings" for the readership. An on-going column devoted to user issues would be most welcome....think the follow-up on recent USING articles could be very valuable in sustaining achieved momentum in this area.

Dave, any ideas you may have in these or other areas would be most welcome. If you have a chance, I would welcome your discussing any of these aspects with JBN or MEJ who are in your area.

Thanks for your consideration, ...Jean 1

20181 Distribution
David H. Crocker, Jeanne B. North, Mil E. Jernigan,

A Review of the SUPARS Report

I have reviewed the SUPARS project report and my comments follow: 1

The best part of the report seemed to be the cost-benefit analysis of search results. They seemed to have done a thorough job and had a good set of conclusions and discussion. The cost model they developed is not useful for us since it is based solely on retrieving documents, but I found it interesting to see how they proceeded. 1a

The other main section was the analysis of user reaction. This seemed to be a description of method accompanied by the results with little analysis. 1b

A very detailed questionnaire on user reaction (which seemed to be good) was presented, and the method used for conducting a semantic differential was detailed. 1b1

The thing that bothered me though was that it seemed their only conclusion was that people have a positive reaction to SUPARS and it was a good thing, which it may be, but it seems a simpler method could have been employed to detect a positive attitude among users. 1b2

Some of their ideas on how to measure user reaction may be helpful as we think about doing the same with the new command language and the utility but it might be helpful to decide what things we would like to know first so that the method of analysis will answer the questions. It seems that something other than "they like it" should be the result of such an analysis. 1b3

One interesting comment in the introduction was "Frustration occurred most often when it was impossible to be connected with the SUPARS system. The little hostility which was noticed seemed to have been caused by a very strong prejudice against computers or machines in general, and not SUPARS in particular". It seems the same may be true of NLS. 1c

20182 Distribution
Paul Rech,

CHI 15-NOV-73 17:46 20183

Display Techniques for Interactive Text Manipulation

Submitted to 1974 National Computer Conference

Display Techniques for Interactive Text Manipulation

Display Techniques for Interactive Text Manipulation.

by

Charles H. Irby

Augmentation Research Center

Stanford Research Institute

Menlo Park, California.

(415) 326-6200 extension 4611.

Display Techniques for Interactive Text Manipulation

PROGRAM AREA: Software Systems or Computer Architecture and Hardware

ABSTRACT

This paper describes techniques, methods, and concepts of displaying text for two-dimensional interaction between people and a computer-based information system. Some fundamental differences between textual and pictorial graphics prohibit the direct use of "structured" graphics techniques and modify the notion of a "virtual" text display. A parameterized approach has been developed which yields the same kind of flexibility and adaptabilty for text manipulation as the former approach did for pictorial manipulation. Our conceptual model for text displays includes the concept of "display windows" containing "character strings" that can be manipulated independently. The mouse and keyset are important aids to display interaction.

I INTRODUCTION

The Augmentation Research Center (ARC) at the Stanford Research Institute (SRI), has been developing for several years a computer-based on-line system called NLS. NLS is part of ARC's research on enhancing the intellectual effectiveness of people [3,5,6,7,10,12,13,15]. Central to the developments to date is highly interactive text manipulation using chiefly display terminals [16,17,18]. The NLS system supports a range of display terminals (from expensive text/graphics displays to inexpensive Alpha Numeric displays [1,2]) and typewriter terminals. The NLS program runs as a subsystem within a TENEX time-sharing system on a DEC PDP-10 computer [9].

NLS is a program of about one hundred thousand instructions and about eight programmers are involved in its continued development and maintenance. Since the program has been and will be under development for several years, considerable attention is given to the employment of good software engineering practices.

NLS provides a general purpose interface to any of a large number of specialized capabilities that the user may draw upon during his work. Certain capabilities, such as text manipulation and communication with others, are important to almost any type of intellectual work, and, thus, they have received a large amount of our development resources. NLS provides the user with a

consistent and coherant command language interface while allowing him to access diverse capabilities. The system is used intensely in the day-to-day work of about fifty people, some of whom access the system through the ARPA NETWORK [11,14]. These people are writers, managers, engineers, analysts, and programmers.

In addition to very flexible text editing and viewing, NLS provides the user with facilities for comunication, publication-quality formatting control, numerical calculation, specialized user-supplied editing and viewing, and programming support (such as a built in debugging system and direct access to several compilers).

For a more complete description of NLS and its applications, the reader should consult references 3 and 5.

Figure 1 describes the basic structure of the NLS application program. This paper is primarily concerned with the capabilities that the Display Terminal Interface provides to the rest of the application program.

Based on the command language grammer and the user's input, the command language interpreter invokes various manipulators to modify data structures and, if appropriate, formatters to map these data structures into specified rectangular portions (called "windows") of the display screen for the user to see. User input

in Figure 1 represents character input, coordinate input, and selection input (based on coordinate input).

A manipulator is that set of routines that manipulates data structures of a certain type, say type "A". An example might be the data structures used to represent a hierarchical structure that is applied to the textual information contained in the user's files. Some of the data structures are contained in the user's files; others are used to maintain user or system state information and characteristics. Such a manipulator might be applied to any of several instances of type A data structures or might always be applied to a specific instance.

A formatter consists of those routines that map a data structure of a certain type into a rectangular "window", say "a", on the display screen. Such a formatter might invoke subformatters to handle subparts of the data structure, and it might be applied to a particular instance or to any of several instances of such a data structure. A formatter might be applied to a specific window or applied to any of several windows.

In order to minimize the number of changes that will have to be made to the screen, a formatter may compare what is currently shown in the window to what is desired. To facilitate this, a formatter maintains a data structure to reflect the current contents of the window. Alternatively, the formatter may simply

clear the window and format the new data into it. The size of the window (the number of characters wide and lines high) is available to a formatter from the Display Terminal Interface.

The Display Terminal Interface is that set of routines that provides the application program with primitive operations for the manipulation of and interaction with a conceptual display terminal. This interface allows the application program to support physical displays with quite different characteristics. The protocol between the terminal and the Display Terminal Interface may vary with the terminal type.

Figure 2 illustrates the window organization of a typical NLS display screen. Figure 3 shows an actual screen organized in this way. Figures 4 through 8 show other organizations on various physical display terminals.

In developing the graphics portion of the system, we wished to make use of the fairly well-known notions of "structured" display images and "virtual" display terminals in order

(1) To support a wider range of terminals without major changes to the application program.

(2) To minimize the amount of information to which a particular formatter must have access in order to modify a certain portion (window) of the display.

By "structured" display images, we mean display images subdivided into a structure (usually hierarchical or sequential), such that the parts of the structure can be modified (such as deleted, moved, or replaced) independently from the rest of the display image. By "virtual" display terminal we mean a display terminal manipulated by an application program so that conceptual display properties can be mapped by interface routines into appropriate commands for the physical display being supported.

However, in attempting to apply these techniques to text display and manipulation, we discovered that there are some underlying differences between pictorial graphics, on which these techniques work quite well, and textual graphics. These differences forced us to develop a slightly different conceptual model for text displays. This paper reports what we now know about the differences and the conceptual model we have developed.

II SOME FUNDAMENTAL DIFFERENCES BETWEEN TEXTUAL AND PICTORIAL GRAPHICS

Although pictorial and textual graphics are similar in most respects, there are some problems dc unique to textual graphics

(1) On most displays, only characters of certain sizes and spacing are acceptable to the human user (or can be displayed at all).

(2) Often, characters can only be displayed at certain coordinate positions with a predetermined spacing between characters. Thus, mapping a virtual coordinate system onto a physical screen may be difficult. Most displays with fixed-spaced character fonts can be thought of in terms of a character-grid coordinate system, which is not necessarily the same as its pictorial coordinate system.

(3) In general, text cannot be scaled, rotated, or translated by arbitrary amounts (as can most pictorial images).

(4) In order to control text formatting, the application program must know the character-grid coordinate system(s) of the physical display.

In order to do its job effectively (from the user's standpoint), the application program must be able to determine the

useable character sizes and fonts and their associated character-grid coordinate systems for the physical display it is supporting.

These fundamental differences forced us to develop the conceptual model discussed in the following section.

III A CONCEPTUAL MODEL FOR TEXT DISPLAYS

Our requirements for a conceptual model of a text display are as follows:

(1) Characteristics of the physical display should be isolated or parametric. A range of physical displays must be supported with minimal impact to the application program. We have found the "isolation of knowledge" to be an essential software engineering principle to effect long term reliability, flexibility, and maintainability of a large software system.

(2) Separate parts of the application program must be able to manipulate independently the text on portions of the screen.

(3) The user must be able to "select" text on the screen by means of some type of "pointing" device. By a pointing device, we mean a device that is capable of transmitting coordinate data to the application program (e.g., mouse [17], stylus and tablet, joy stick) in response to some user action, such as depressing a button or a key. The pointing device should be coupled to the display in such a way that it gives the user some indication (e.g., the visual indication

provided by tracking the device with a cross-hair) of what he is likely to select if he makes a selection. When the user wishes to select some text on the screen, he moves the pointing device so that it (or its displayed tracking spot) is near the desired text and takes the appropriate action to cause the coordinates to be transmitted. The application program should then determine which text is nearest the coordinates that were input and show the user what it found (e.g., by highlighting the selected text as in Figure 4). This must be done in such a way that the user can "back up" (say, by depressing some other button) and retry the selection.

(4) The ability of two or more users to "share screens" must be provided. We find great value in the ability of two or more people who are geographically distant to run NLS using display terminals through the ARPA Network and share screens. By this we mean both see the same image on their screens and both can control the application program that manipulates the image. The situation is analogous to several people standing together at a blackboard, where all can see what each writes. This sharing is greatly

facilitated, of course, by a telephone connection. By this means, distributed people can work together on such things as reports, designs, papers, proposals, and computer programs. Video projectors also allow distributed meetings.

(5) If the application program needes to use the same portions of the screen for different purposes, it is very convenient for the application program to be able to suppress the display of part of the image and later to be able to restore it to sight. This is useful since most display screens are quite small, in terms of the number of readable characters they will support, and portions must often be used for several purposes. For example, the same portion of the screen might be used for the display of information from the user's files and for the display of status messages or the feedback of user input. The suppression capability allows the application program to overlap windows and use the physical screen space to best advantage without having to dedicate protions of the screen to infrequently used purposes.

Figure 7 shows a situation where the display of a file text window has been suppressed in order for the user to

interact with a debugging program in that portion of the screen. Figure 7 also shows feedback of user input (the text "this is a test") in a sequential window that extends to the bottom of the screen. As the user types more text, lines will be suppressed in the file text windows as needed to avoid superpositioning.

(6) The application program must be able to draw the user's attention to some text on the screen (e.g., make it blink or increase its intensity -- see Figure 3).

(7) Because of the typewriter-like interaction modes of most modern time-sharing systems, typewriter simulation should be possible on a portion of the screen when running the application program in display interaction mode (for system broadcast, error, or warning messages from the time-sharing system). We have found this to be very valuable to the user. This portion of the screen must, in general, be dedicated to this purpose because of the asynchronous nature of these messages. In Figure 7, the debugging program is interacting with the user through typewriter-simulation on the bottom portion of the screen The text on the upper portion of the screen is uneffected by the scrolling (simulating the behavior of Carriage Return

and Line Feed) which takes place during typewriter simulation on the lower portion.

In order to meet these requirements, we have developed a conceptual model of a display terminal. The reader is referred to Figure 1, to the appendix of this paper, and to other referenced material (especially references 2 and 19) for additional details. The primary characteristics of the conceptual model are

WINDOWS AND STRINGS

The display screen is dividable into rectangular, possibly overlapping "windows". Windows may be invisible or visible, random or sequential. Sequential windows behave like typewriter simulations (text is scrolled though them). Random windows contain character strings which can be manipulated (moved, replaced, deleted) independently. Individual strings may or may not be selectable. Text in selectable character strings may be selected by the user via his pointing device as operands to application program commands. The terminal initially has only one sequential window that covers the whole screen and is called the "default typewriter" window.

The application program is expected to allocate windows for various types of information display to the user. Some of these windows are for the purpose of command

specification feedback to the user and others are for the display of information contained in the user's files.

BASIC TERMINAL MODES

The terminal can be in one of two basic modes: (1) "typewriter" mode and (2) "display" mode. In "typewriter" mode, all display windows except the default typewriter window are invisible, the default typewriter window is visible, and coordinate input is disabled; the terminal acts like an alpha-numeric display simulating a typewriter terminal. In display mode, the default typewriter window is invisible and coordinate input is enabled; the application program controls which windows are visible.

POINTING DEVICE INTERACTION

It is assummed that in addition to character input, the terminal also transmits coordinate information along with at least certain characters. In formatting character strings that are selectable by the user (usually representing text from the user's files), the formatters construct a data structure associating each character string with the data element that it represents. When the user subsequently selects a character on the screen, the coordinates that were input are mapped by the display terminal interface, using mapping data that it maintains, into a window-identifier,

string-identifier, and character count. This character and/or neighboring characters may then be "highlighted" on the screen for the user's benefit. The window-identifier, string-identifier and character count are converted by the application program, using the data structure just discussed, into data element identifiers appropriate for its use.

SEQUENTIAL WINDOWS

We assume a situation where the user has only one terminal that must behave like a typewriter terminal at times and like a true two-dimensional display terminal at other times. Thus, sequential typewriter windows are very important. Any text that is received by the display that is not in the context of a display command is "scrolled" through the current typewriter window. The effect of characters like Carriage-Return and Line-Feed are simulated. We expect that, when an application program is initialized, it allocates a small sequential window somewhere on the screen and makes it the typewriter window. Thus, any error messages, system broadcast messages, terminal "linking" [9], and so forth, can be seen by the user while using the terminal in display mode.

DEVICE SPECIFIC PARAMETERS

When the Display Terminal Interface (see Figure 1) is initialized by the application program, it determines (via monitor calls or interaction with an "intellegent" terminal) enough about the display characteristics to manipulate the physical display. It returns to the application program the character-grid coordinate systems for the available character sizes of the terminal. The rest of the application program is then parameterized, on the basis of these values.

To make all of this work, we must make certain assumptions about the display (and any associated processing capability it might logically possess)

It is mandatory that

(1) we can treat the screen like a large character grid and write characters at arbitrary positions on the grid (providing that we do not write past the edge of the screen),

(2) there is some way of mapping our conceptual display primitives, described in the Appendix of this paper, into the primitive operations of the physical display,

(3) there is some way of writing text in a mode such that it

stands out from the rest (e.g. blink, reverse video, underline),

(4) there is some way of highlighting existing text on the screen in such a way that when the highlighting is removed, the original text will look just as it did before it was highlighted (This may be the same as (3) above), and

(5) there is a coordinate input device such that the current coordinates will be input with at least certain characters and such that it can be tracked on the screen.

It is desireable but not mandatory that

(1) there is some way of accomplishing the typewriter window capability (although this is not a must, the capability is certainly useful to the user),

(2) various (fixed spaced) fonts and character sizes are available for the terminal (we plan to extend the model to include proportionally spaced fonts in the future), and

(3) the (intelligent) display terminal is capable of responding to an interrogation command from the Display Terminal Interface. This capability is optional, since

the user can supply the information instead. However, this later approach is not very desirable or reliable.

Our operating system makes assumptions about the type of terminal that one is using. If these assumpions are incorrect (for example, if one has a display rather than a typewriter terminal), then the user must communicate this to the operating system via a command. If the terminal is intellegent and can respond to an interrogation, the user simply specifies this, and when the Display Terminal Interface is initialized, it sends the terminal an interrogation command, to which the terminal responds with its characteristics. Otherwise, the user must supply any needed information about the display terminal or its characteristics must be assumed by the application program.

IV THE MOUSE AND KEYSET AS IMPORTANT AIDS TO DISPLAY INTERACTION IN TEXT EDITING

Although they are very simple devices, we have found that the mouse and keyset, combined with a standard typewriter-like keyboard, form a very balanced and useful set of input devices for two-dimentional text manipulation [4,8,16,17,18]. The mouse is used for pointing and for special function input; the keyset and keyboard are used for character input. The mouse is a small device that has two perpendicularly mounted potentiometers, to which are attached wheels that roll and slide in proportion to the direction of movement, and three buttons. It is an easy "pointing" device to use and causes the user little or no fatigue. It can be used on almost any flat surface, usually a desk top.

The keyset consists of five long keys, similar in shape to white piano keys. The user depresses several keys in unison to input a character. When the thirty-one possible combinations are combined with shift buttons on the mouse, the user is able to completely duplicate the standard keyboard, while keeping one hand on the mouse, ready to point to operands for commands typed in from the keyset. When more than a few characters are to be input, the user removes his hands from the mouse and keyset and uses the typewriter-like keyboard.

The three buttons on the mouse, if depressed and released

without intervening characters from the keyset, have additional functions, the more interesting of the seven being

To select some text on the screen or give final confirmation to begin the execution of a command,

To back-up command specification, to allow the user to redo whatever he just did (e.g. select something else on the screen or retype his last character),

To abort the current command specification and return the user to the begining of command specification. and

To allows the user to modify the parameters which control how his information is presented to him. He may do this in the middle of specifying a command [3].

For a more extensive discussion of these devices, the reader's attention is directed to references 2 and 4.

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APPENDIX: PRIMITIVES OF THE CONCEPTUAL MODEL OF A TEXT DISPLAY

The primitive operations that the Display Terminal Interface provides to the application program are listed here.

For Window Manipulation

WINDOW-ID ← ALLOCATE-WINDOW (X1, Y1, X2, Y2,
CHARACTER-SIZE, FONT, TYPE)

Function: Allocates a rectangular window of the specified type (random or sequential) and position. Establishes default character size and font for the window.

Arguments:

X1,Y1: screen coordinates of upper left corner of window.

X2,Y2: screen coordinates of lower right corner of window.

CHARACTER-SIZE: default character size for this window.

FONT: default font for this window.

TYPE: sequential or random

Returns:

WINDOW-ID: unique identifier for this window (to be used in subsequent commands).

DEALLOCATE-WINDOW (WINDOW-ID)

Function: Deallocates the specified window.

CLEAR-WINDOW (WINDOW-ID)

Function: Deletes contents of window and removes image from the screen.

INVISIBLE-WINDOW (WINDOW-ID)

Function: Makes the contents of the window invisible (no image on the screen).

VISIBLE-WINDOW (WINDOW-ID)

Function: Makes the contents of the window visible (image appears on the screen).

TYPEWRITER-WINDOW (WINDOW-ID)

Function: Makes the specified (sequential) window the typewriter window. All "unescorted" characters (not within a display command) will be scrolled through this window. These character can also be scrolled through the default typewriter window so that the user can see then when the terminal is returned to typewriter mode.

For Character String Manipulation

STRING-ID ← WRITE-STRING (WINDOW-ID, X, Y, CHARACTER-SIZE, FONT, HIGHLIGHT, SELECTABLE, CHARACTERS)

Function: write the specified string in the window, with the specified properties at the specified position.

Arguments:

WINDOW-ID: unique identifier for a window.

X,Y: window coordinates of the first character of the string.

CHARACTER-SIZE: Use specified character size for this string or use window default.

FONT: Use specified font for this string or use window default.

HIGHLIGHT: If specified, highlight this string (make it stand out to user).

SELECTABLE: If specified, characters in this string may be selected by the user via the SELECT-CHARACTER primitive.

CHARACTERS: the characters to be displayed.

Returns:

STRING-ID: unique identifier for the string within this window.

REPLACE-STRING (WINDOW-ID, STRING-ID, X, Y, CHARACTER-SIZE, FONT HIGHLIGHT, SELECTABLE, CHARACTERS)

Function: Replaces the specified string in the specified window by the characters specified. If the X,Y coordinates are not specified, the current position is used. FONT and CHARACTER-SIZE may be defaulted to the old values for the string or to the window defaults. If HIGHLIGHT is specified, the string is made to standout from normal text on the screen.

MOVE-STRING (WINDOW-ID, STRING-ID, X,Y, CHARACTER-SIZE, FONT, HIGHLIGHT, SELECTABLE)

Function: Move the specified string to the specified position within the window.

DELETE-STRING (WINDOW-ID, STRING-ID)

Function: Delete the specified string from the specified window.

INVISIBLE-STRING (WINDOW-ID, STRING-ID)

Function: Make the specified string invisible to the user (no image on the screen).

VISIBLE-STRING (WINDOW-ID, STRING-ID)

Function: Make the specified string visible to the user (image on the screen).

CLEAR-STRING (WINDOW-ID, STRING-ID)

Function: Same as REPLACE-STRING with null string.

For Sequential Window Manipulation

APPEND-TEXT (WINDOW-ID, CHARACTERS)

Function: Append the specified characters to the specified sequential window. Carriage Return and Line Feed characters are simulated within primitive and are automatically inserted to avoid characters exceeding the right edge of the window.

For Highlighting Characters

MARK-CHARACTERS (WINDOW-ID, X1, X2, Y)

Function: Highlight the characters from postion X1,Y to X2,Y in the specified window, such that the mark can be removed with REMOVE-MARK and the original characters will be unchanged. It is desireable, but not mandatoy, for the user to be able to read characters that are marked by this primitive.

REMOVE-MARK ( )

Function: Remove the last mark put on the screen with MARK-CHARACTERS.

CLEAR-MARKS ( )

Function: Remove all marks put on the screen with MARK-CHARACTERS.

For Cursor Manipulation

SET-CURSOR (CHARACTERS)

Function: If possible for this display terminal, set the primary cursor (the one that tracks the user's pointing device) to the specified characters.

PLOT-SECONDARY-CURSOR (X,Y,CHARACTERS)

Function: Plot a secondary cursor at screen position X,Y using the characters specified if possible. This must be done in such a way that the

original

text on the screen is not destroyed. This primitive is used in screen sharing.

For User Input

CHARACTER ← READ-CHARACTER ( )

Function: Read the next character input from the terminal.

(X,Y) ← READ-CURSOR-COORDINATES ( )

Function: Read the next (screen) coordinates input from the terminal.

SEND-COORDS-WITH-CHARACTERS ( )

Function: Begin sending cursor (screen) coordinates with (at least certain control) characters.

DONT-SEND-COORDS-WITH-CHARACTERS ( )

Function: Stop sending cursor coordinates with any characters.

TIME-INTERVAL-COORD-INPUT (TIME-INTERVAL)

Function: Begin reporting cursor coordinates periodically (when they have changed), independent of user actions, for use in screen sharing.

For User Selection of Text on the Screen

(WINDOW-ID, STRING-ID, CHARACTER-COUNT, X', Y') ←
SELECT-CHARACTER(X,Y)

Function: Given the screen coordinates X,Y, find the nearest selectable character on the screen.

Returns:

WINDOW-ID: The unique identifier for the window containing the string that contained the selected character.

STRING-ID: The unique identifier for the string containing the selected character.

CHARACTER-COUNT: The index into the string identified by STRING-ID of the character that was selected.

X',Y': The window coordinates of the selected character.

WINDOW-ID ← SELECT-WINDOW (X,Y)

Function: Given the coordinates X,Y, return an identifier for the nearest window containing selectable character strings. Such windows should not overlap.

For Batch Processing Display Commands

PROCESS-COMMANDS (DISPLAY-COMMANDS-LIST, WINDOW-ID)

Function: Given a list of display commands (like those described above), perform the operations all at once on the display in a manner appropriate to the actual display.

For Error Messages

OUTPUT-ERROR-STRING (CHARACTERS)

Function: Output the error message in a manner appropriate to the display.

For Determining Display Characteristics

PARAMETERS ← INTERROGATE-DISPLAY ( )

Function: Determine the useable character sizes, fonts, and character-grid coordinate systems for the display. The "normal" character size and font are also indicated. Execution of this primitive also initializes the Display Terminal Interface routines to work with the actual display.

For Basic Mode Switching

TYPEWRITER-MODE ( )

Function: Put the terminal in typewriter mode. Make all windows invisible except for the default typewriter window and disable coordinate input.

DISPLAY-MODE ( )

Function: Restore terminal to display mode. Make default typewriter window invisible, make any windows that were visible prior to the last TYPEWRITER-MODE command visible again, and enable coordinate input.

For Reseting the Terminal to Its Initial State

RESET ( )

Function: Reset the display terminal to its initial

state, simulating a typewriter-like terminal with no windows allocated and not sending coordinates with any characters.

Figure 1. BASIC STRUCTURE OF NLS.

SRI FIGURE ID: SA-1868-3

Figure 2. A TYPICAL NLS DISPLAY SCREEN SUBDIVIDED INTO WINDOWS -- SEE FIGURE 3.

SRI FIGURE ID: SA-1868-6

Figure 3. Photograph of NLS display which corresponds to Figure 2. Typewriter simulation window and type in feedback window are empty. The display terminal is a Delta Data 5200 with a Line Processor [1,2]. Note highlighted text in upper file window, operands selected by the user for the Transpose Word command. Text may be moved from one file to another by selecting operands in separate file windows.

SRI PHOTOGRAPH ID: 1868-F46

Figure 4. Photograph of IMLAC PDS-1 NLS display Terminal with one file window.

SRI PHOTOGRAPH ID: 1868-F43

Figure 5. Photograph of IMLAC PDS-1 NLS display Terminal with two columnar file windows with two different files being displayed.

SRI PHOTOGRAPH ID: 1868-F42

Figure 6. Photograph of Local Display terminal screen with one file window showing documentation for debugging program.

SRI PHOTOGRAPH ID: 1868-F45

Figure 7. Photograph of Display screen with one file window and one typewriter window (lower portion of screen). User may interact with NLS on upper portion of screen or with debugger on lower portion.

SRI PHOTOGRAPH ID: 1868-F48

Figure 8. Photograph of local display screen showing use of numerical calculation features with a transaction history window on left and user's file on right.

SRI PHOTOGRAPH ID: 1868-F44 .

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