0633-74 31117

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Network Working Group
RFC #647
NIC #31117

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MITRE-TIP
November 12, 1974

A PROPOSED PROTOCOL FOR CONNECTING HOST COMPUTERS TO ARPA-LIKE NETWORKS VIA DIRECTLY-CONNECTED FRONT END PROCESSORS

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NO -- repeat NO -- expression of general agreement should be taken to apply to Appendix 2, which is exclusively a personal viewpoint.
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INTRODUCTION

As this proposal is written, in the fall of 1974, the ARPA network has achieved sufficient acceptance that a rather large number of organizations are currently planning either to attach their general purpose computer systems directly to the ARPANET or to interconnect their systems employing "ARPANET technology". The authors have been in touch with efforts sponsored by the Air Force Systems Command, the Naval Ship Research and Development Center, the Defense Communications Agency ("PWIN" -- the Prototype World-Wide Military Command and Control System Intercomputer Network), ARPA (the National Software Works), the AEC, and other government agencies. A common characteristic of these networks and sub-networks is the presence of a number of systems which have no counterparts on the current ARPANET; thus, hardware "special interfaces" (between the Host and the network Interface Message Processor) and -- more important -- Network Control Programs cannot simply be copied from working versions. (Systems include CDC 6600's, XDS Sigma 9's, Univac 494's, 1107's, 1108's, and 1110's, and IBM 370's running operating systems with no current ARPANET counterparts). Because it is also widely accepted that the design and implementation of an NCP for a "new" system is a major undertaking, an immediate area of concern for all involved is to develop an approach for attaching systems to networks which employs as much off-the-shelf hardware and software as is practicable. This paper addresses two such approaches, one which apparently is popularly assumed as of now to be the way to go and another which the authors feel is superior to the more widely known alternative.

"FRONT-ENDING"

In what might be thought of as the greater network community, the consensus is so broad that front-ending is desirable that the topic needs almost no discussion here. Basically, a small machine (a PDP-11 is widely held to be most suitable) is interposed between the IMP and the Host in order to shield the Host from the complexities of the NCP. The advantages of this fundamental approach are apparent: it is more economic to develop a single NCP. "Outward" (User Telnet) network access is also furnished by the front end acting as a mini-Host. The potentiality exists for file manipulations on the mini-Host. Two operating systems are in advanced stages of development on the ARPANET for PDP-11's which will clearly serve well as bases for network front ends; thus, the hardware and software are copiable. So if we consider a model along the following lines

Host *** Front End --- IMP --- Network

everything to the right of the asterisks may almost be taken as given.

(Caveat: Note the "almost" well in the last sentence; neither ANTS nor ELF -- the two systems alluded to above -- is a completely finished product in the estimation of either their respective developers or of the knowledgeable ARPANET workers who have contributed to this report. Both are capable of being brought to fruition, though, and in a reasonable amount of time. We will assume ELF as the actual front-end system here for two reasons: apparent consensus, and current activity level of the development team. However, we have no reason to believe that readers who prefer ANTS would encounter substantive difficulties in implementing our proposal on it.)

(Explanatory notes: ANTS is an acronym for ARPA Network Terminal Support system; it was developed at the Center for Advanced Computation (CAC), University of Illinois. ELF is not an acronym (it is said to be German for "eleven"); it was designed at the Speech Communications Research Lab (SCRL), Santa Barbara, California.)

THE RIGID FRONT-END ALTERNATIVE

Referring back to the model above, the popular view of the asterisks is to have the front-end system simulate a well known device for each Host (typically a remote job entry station along the lines of the 200UT on the CDC 6600), effectively requiring no software changes on the Host system. We characterize this approach as "rigid" because an immediate implication is that the Host system is constrained to handle data to and from the network only in fashions which its system already provides. (E.g., if you simulate a card reader, your data will necessarily be treated as batch input; if a terminal, necessarily as time-sharing input.) Now, it may be argued that Host software changes are only being shunned in order to "get on the air" quickly, and may be introduced at a later date in order to allow unconstrained channelling of network data within the Host; but this reasoning may surely be refuted if it can be shown that an alternative exists which is essentially as quick to implement and does not require the waste motion of constructing known-device simulation hardware and software for each new Host, only to eventually avoid the simulation in the Host.

The major advantage which might be claimed for the rigid front-end approach other than quickness to implement would be embarrassing if true. That is, the possibility exists that either the "new" Hosts' operating systems or system programming staffs are so intractable that avoiding Host software changes is a necessity rather than a desire. We certainly hope neither is the case and have no reason to believe it to be so, but we must acknowledge that such possibilities exist as meta-issues to this report.

DISADVANTAGES OF THE RIGID FRONT-END ALTERNATIVE

The rigidity argument sketched above merits some amplification. The major disadvantage of interfacing with the Host only in fixed ways lies in a loss of functionality. Granted that "Telnet" and "RJE" functions can be performed (though we have deep reservations about file transfer) by simulating a known device there are more things in practice and in theory than just using the Hosts' time-sharing and batch monitors. "Teleconferencing" is an instance which comes immediately to mind. Graphics is another. Neither fits naturally into the setting a typical operating system is likely to assume for a Telnet or RJE connection. Further, the ARPANET is just beginning to evolve a view of "process-to-process" protocols where cooperating programs on dissimilar systems communicate over network sockets in a true use of sockets as interprocess communication media. It is difficult to conceive of viewing a (simulated) line printer as an abstract "port" without considerable contortion of the extant operating system. To attempt to summarize this cluster of objections, a simulation of a known device may be cheaper than a large enough number of phone calls, but it's not networking.

For that matter, it is by no means clear that the goal of no Host software changes can even be met. In the case of one particular system on the ARPANET where a PDP-15 was employed as a front end to a PDP-10, one of the authors discovered that on attempting to login over the net he was confronted by an interrogation as to the type of terminal he was at -- the front end having been attached at the wrong point in the PDP-10's terminal handling code. (Being a battle-scarred veteran of Telnet protocol development, he gave suitable answers for describing a "Network Virtual Terminal". Unfortunately, however, the NVT apparently had no counterpart in the Hosts' normal complement of local terminals. And when he tried such Telnet control functions as "don't echo, I'm at a physically half-duplex terminal" things really got confused). As it happens, he later found himself in the neighborhood of the Host in question, and found himself spending an afternoon attempting to explain the philosophy and importance to the Telnet protocol of the NVT. The site personnel were both appreciative and cooperative, and although we have not had occasion to verify it, we assume that the site is probably now usable from the ARPANET. The important point, though, is that operating systems tend to make extensive, often unconscious, assumptions about their operating environments. This observation is particularly true when it comes to terminal types, and the problem is that there is simply no guarantee that the several systems in question could even "do the right thing" if they were front-ended by simulating a known device -- unless, of course, the simulation of the device in the mini were so painstaking that all we'd get would be an expensive way of adding an RJE station, period.

Less abstract considerations also apply. For one thing, a mini-computer -- even with "third-generation" software -- is not as free and convenient an environment to program in as a full-scale Host; therefore, implementing the several simulations will not be trivial pieces of software engineering. Further, if the simulation software is prepared by front-end experts, they will encounter repeated start up transients in learning enough about the expectations of the several Hosts in order to perform their tasks. For that matter, it is clear that if personnel from the several Hosts are barred from active participation in attaching to the network there will be natural (and understandable) grounds for resentment of the "intrusion" the network will appear to be; systems programmers also have territorial emotions, it may safely be assumed.

On a still more practical level, it should be noted that the potential need to simulate more than one known device -- and even the potential complexity of any single device simulation -- may well lead to a requirement for a larger PDP-11 configuration than would otherwise be reasonable. And although there are other reasons for arguing that each front-end processor ought to be as big a configuration as possible, we must acknowledge that dollars do matter. Also on the topic of numbers, it should be further noted that the line speeds available for known-device simulations can be quite low. The 2000T, for example, is on a 4800 baud line, which is rather a mismatch with a 50,000 baud communications subnet. (Of course, there's always the 40,000 baud line into the 6600 -- but it isn't expected to have interactive devices on it, so the extant software won't send the data to the "right place"....) And no experienced ARPANET protocol designer would be willing to overlook the possibility that there will probably have to be a flow control discipline between the Host and the front-end processor anyway, so the no change to Host software goal becomes rather dubious of fulfillment.

After all that, it is perhaps gratuitously cruel to point out still another level of difficulty, but we feel quite strongly that it should be addressed. For, it must be admitted, the question must be asked as to who will do the front-end implementations. This sort of thing is scarcely within the purview of CAC or SCRL. But, as will be urged in Appendix 2, it is of the utmost importance that whoever performs the task already have ARPANET expertise, for we know of no case where "outsiders" have successfully come aboard without having become "insiders" in the process, which is neither an easy nor a cost effective way to proceed.

In light of the above, it is at least reasonable to consider an alternative to the rigid front-end approach, for regardless of the weight the reader may attach to any particular cited disadvantage, in total they at least suggest that the known-device simulation tactic is not a panacea.

THE FLEXIBLE FRONT-END ALTERNATIVE

Our alternative approach is based on a principle which actually has been around since at least a month before the ARPANET began running User and Server Telnets on a regular basis. The principle is that it would be nice to off-load as much as possible of the NCP from the Host, because Hosts are supposed to have better things to do with their cpu cycles than field control messages from other Hosts -- especially when 90% of the control messages are merely ALL(ocate) commands. This insight led to the notion that all a Host "really" has to do is associate sockets with processes (and, of course, pass data along socket connections). And the flexible front-end approach is no more than an updating of these 1971 ideas to the following: drop the hard and fast goal that there will be NO changes to Host software in favor of the more realistic goal of making MINIMAL changes to the Host; attach the front-end processor to any convenient high-speed "channel"(/ "port" / "multiplexer" / "line" / "cable"); let the front-end processor handle the NCP; define an extremely compact protocol for the Host and front-end to follow (the H-FP); and let the Host H-FP module distribute the data appropriately within its operating system, because the H-FP will make it clear where the data should go and if you have to ram the data into the teletype buffers, it's still cleaner than trying to do interprocess communication over a card reader. (The H-FP is detailed in less bald terms in Appendix 1). Now that might sound rather uncompromising -- and almost surely sounds rather cryptic -- but between the advantages it engenders and the more comprehensive description which follows, we feel that it does represent a superior basis for solving the overriding problem of how best to attach "new" Hosts to an ARPA-like net.

ADVANTAGES OF THE FLEXIBLE FRONT-END ALTERNATIVE

The primary advantage of the flexible front end alternative is precisely its flexibility: Although minimal implementations may be envisioned on given Hosts, the most minimal of implementations is still as powerful as the rigid front-end approach; and as the need for more functions is perceived, they may be coded for quite easily with our approach. This is so because programs in the Host can "get their hands on" data from the net (and send data to the net) in a natural fashion -- it is not the case that only those things done on a given system with the data from, say, a card reader, can conveniently be done here. Thus, in contrast to the rigid front-end approach, the flexible front-end approach "is networking". Indeed, it should be noted that a major "real" ARPANET server site has expressed an interest in implementing the H-FP based on some five minutes' worth of blackboard explanation with two of the authors.

Another advantage of our approach is that it involves personnel at the various new sites in the process of coming aboard the network. Not only does this involvement have merit psychologically (if known-device simulation were employed, the network could represent an alien intrusion forced upon them, to site systems types), but it is also technically preferable to have the per-site coding done by "experts", which would not be the case if the per-site tailoring were done exclusivly in the mini. Recall the PDP-15 to PDP-10 attempt discussed earlier. That case may fairly be viewed as one of the front ending's having been performed in ignorance of the conventions of both the Host's operating system and of the ARPANET? Not only should that sort of thing be avoided by the expedient of involving experts on the target operating systems in the process of attaching to the network@ but there are practical considerations as well: We estimate that adding a minimal Host-Front End Protocol routine in a given operating system would require no longer than the same few man months to develop than would the adding of a new known-device simulation package to the mini. So that we forsee scheduling advantages in addition to the more abstract ones already asserted. Further, it ought to be a more friendly environment to program in on the Host than in the mini. (This is not to say the BLF does not appear to be a good environment to program in; rather, it is to make the "obvious" claim that if the big systems did not furnish convenient programming environments we wouldn't have them.)

As touched on earlier, another point which bears further examination is the area of flow control. The known-device simulation approach appears to assume that this too will be handled by the mini, and that the simulation will be aware of whatever flow control discipline the Host and the physical device being simulated follow. However, when the one device "everybody knows" will be simulated (CDC 2000T) operates on a 4800 bit-per-second line, and the IMP subnetwork operates on 50,000 bps lines, some attention must be paid to the mismatch -- especially in view of the fact that only one process in the Host is typically associated with a known device, but the network actually transmits data on behalf of many processes. Our approach, on the other hand, allows for a very direct, simple flow control discipline to be imposed, without getting involved in per-Host idiosyncrasies. (The option to go to more elaborate -- potentially more efficient -- flow control disciplines is also provided.) Thus, we can simply pick the best line speed available on a particular Host, and attach to it.

Notice one other level of practical advantages: The mini's H-FP module can be furnished along with its operating system by the same network "insiders" who are furnishing the operating system itself. Thus, a critical task need not be subjected to the perils of subcontracting. Indeed, this approach lends itself far more readily to subcontracting than the other, if subcontracting must be done for the per-Host software; for with the PDP-11 being

almost always the same, network "insiders" can be used in conjunction with site personnel to build Host H-FP modules either through commercial consulting contracts or even from within the ARPANET community. (The latter possibility exists because another fact about system programmers is that -- although they resent "invasions"-- they tend to enjoy getting inside new and different systems, if only to feel superior to them in contrast with their own.)

The strengths of the flexible front-end approach, then, tend to arise in exactly those areas of weakness of the rigid front-end approach. Perhaps most important of all, though, is the fact that it "makes sense" to almost every single experienced member of the ARPANET community with whom it has been discussed. So, we might reason, if the ARPANET is desirable, it is desirable because of the efforts of those who made it work; and if they have gained insights into networking in general in the process, their opinions deserve particular attention.

RECOMMENDATIONS

The protocol specified in Appendix 1 is felt to be around 90% complete. We are aware that we have not specified all the codes that will be needed to describe conditions of which the Host and Front end must apprise each other, for example. But we think that, in general the protocol "works". We stand willing to discuss it with cognizant decision makers in the various interested organizations, and, for that matter, to continue to debate it with our technical peers. At this stage, however, the dominant consideration would appear to be that the cognizant decision makers avert the apparent stampede to the rigid front-end approach and evaluate the flexible front-end alternative in light of the preceeding arguments and the following protocol specification.

APPENDIX 1. THE HOST-FRONT END PROTOCOL

ASSUMPTIONS

The physical connection of the front end (FE) to the Host is assumed to be made over the "best" port (or channel, line, etc.) available on the Host, where "best" covers both line speed and quality of software available to physically manage the line. The choice should be made by site personnel. Hardware interfacing capability is assumed to be straightforward; it is, at least, no more complex for the H-FP than for known-device simulation. The connection is assumed to be sufficiently closely coupled that a simple, explicit acknowledgment H-FP command will offer satisfactory flow control. That is, distances are assumed to be short and bit rates high; thus, the same assumptions are made here as are made in the case of Local IMP-Host interfaces: that error checking and flow control are not first-order problems.

On the software level, buffering is assumed to be adequate in the Host to accept at least a full (8096 bit) IMP-IMP meassage -- although the FE could probably get around this constraint if it absolutely had to. Given only a minimal H-FP module in the Host, the FE will allow the same level of Telnet and RJE functioning as would the known-device simulation, as follows: The FE will always shield the Host from the NCP commands and the simplex sockets they deal with, dealing instead with a repertoire of but five H-FP commands and conversing over duplex data streams with the appropriate management of Network sockets left to the FE. (The commands are described below; we continue with the discussion of assumptions here, but some readers may prefer to study the commands before continuing with the balance of this section.) For Telnet, although subsequent analysis may lead to a more sophisticated treatment, the present assumption is that the FE will normally refuse all "negotiated options" and strip all Telnet control codes from the data it passes to the Host (unless the Host orders it to pass an unaltered Telnet stream); on a per-installation basis, the FE will also map from Telnet ASCII to the Host's desired character set. Telnet "interrupt process" controls are handled by an H-FP command, discussed below.

For RJE, because the ARPANET RJE protocol is only known to have been implemented on one Host in the ARPANET and is generally considered to be too cumbersome, the standard socket for RJE will be reserved for future use, and a special designator will indicate to the Host that input on the given connection is to be treated as data in the format and job control language of its own "batch" system. Again, character set mapping will be available on a per-installation basis.

For file transfer, however, a further assumption must be made about Host software. This is because the FE cannot be expected

to manipulate the Host's file system; therefore, if the Host wishes to participate in file transfer activities its H-FP module must be able to access the Host's file system for both sending and receiving files. Again, the FE will be able to shield the Host from the details of the underlying protocols to a large extent; but the Host must be able to handle FTP "stor" and "retr" commands, which will be passed over the (single) connection opened between the FE and the Host for file transfer. (FTP "user" and "pass" commands might also be dessirable. As with Telnet, the FE will manage the various Network sockets involved so as to allow the Host to operate on only the H-FP connection, and will again optionally perform character set mapping. Note that Hosts may refuse to open FTP connections until and unless they choose to, with no impact on the FE.

The Host's H-FP module, in short, will interpret the commands of the protocol, distribute Telnet data to and from the appropriate points within its operating system where terminal I/O is expected, distribute RJE data in like manner, and when it is able to do so handle FTP as sketched above and amplified on below. It will, also on a when-desired basis, support calls from its system's user processes for unspecified purposes I/O on ARPANET sockets to allow for such functions as telelconferencing and other process to process exploitations of the Net. Our overriding assumption is that the initial H-FP module for a given Host (which does not require FTP or unspecified socket capability) will not be appreciably harder to implement than a known-device simulation; that it will offer extensibility to more interesting uses of the Network than the alternative has been sketched here and will be returned to after the H-FP commands are described.

FORMAT OF THE COMMANDS

All communication between FE and Host is performed in terms of H-FP commands. The fields of the several commands are one or more "bytes", where a byte is a per-installation parameter of 8, 9, 12, 16, 18, 32, 36, 48, 60, or 64 bit width, according to the coding convenience of the given Host's H-FP module implementers? (6 bit bytes are not supported because they do not offer enough room to express all the values anticipated for certain code fields; machines with 6 bit internal byte structures can specify 12 bit H-FP bytes and still be able to use their natural byte oriented instructions.) Values for fields will be right-justified within their (potentially several) byte widths. Note that the list of byte sizes is 1) not meant to be exhaustive, and 2) probably unnecessarily extensive -- as 8, 9, and 12 are probably the only "reasonable" sizes in actual practice (but if a particular machine is better suited for handling whole words rather than fractions thereof, the FE can certainly make life more convenient for it.)

Although the commands are given names for documentation purposes, the value transmitted in the first byte of each command will be

the binary representation of the number shown before its name in the next section. (i.e., the command field is one byte wide.)

COMMANDS

(Note that all commands may be sent by either the FE or the Host.)

1: BEGIN INDEX HOST SOCKET TRANSLATION-TYPE CONNECTION-TYPE

The BEGIN command establishes a "connection" between the Host and the FE. Regardless of internal representation, the duplex data stream the connection represents will be referred to by the value specified in the next (INDEX) field; that is, for example, the FE will send input from and receive output for a given Telnet connection "on" a given INDEX, even though it is actually managing two NCP "sockets" for the purpose in its dealings with the Network.

a) INDEX is a two-byte field. Both the Host and the FE may choose arbitrary values for it when opening connection with a BEGIN command (H-FP implementations will probably simply increment INDEX by 1 whenever they need a new connection); however, the value of 0 is reserved to apply to the "global" connection between the Host and the FE -- thus, when either machine "comes up" the first thing it does is send a BEGIN for INDEX=0. (The END and ACKNOWLEDGE commands also follow this convention; for that matter, there is no reason why the MESSAGE command could not also, should it be desired to extend the FE's functions in the future. At present, however, this is merely a potential extension.) Note that all other fields should be set to 0 for INDEX 0 BEGINS.

b) HOST is a two-byte field. It specifies the Host number associated with the socket in the next field. On FE to Host BEGINS this is purely informational. However, on Host to FE BEGINS it is necessary to enable the FE to identify the foreign Host with which to communicate at the NCP level.

c) SOCKET is a four-byte field. If SOCKET=1, a Telnet connection is to be established. If SOCKET=3, an FTP connection is to be established. If SOCKET=5, an ARPANET RJE Protocol connection is to be established (no known current utility). If SOCKET=77, a Host-specific connection is to be established for RJE/batch. All other values are for connections for unspecified purposes, to be opened at the NCP level according to the CONNECTION-TYPE field. Note that sockets 1, 3, 5, and 77 are "known about" and special-cased by the FE.

d) TRANSLATION-TYPE is a one-byte field. From FE to Host, it is informational. From Host to FE, it specifies character set mapping if desired, or characterizes the data to be transmitted over the connection. 0 requests / specifies ASCII data; 1,

binary data (note that this value will not be sent from FE to Host under current assumptions, and that word size is to be a per-installation parameter); 2, mapping of ASCII to/from local character set. Other types will be defined if needs are identified.

e) CONNECTION-TYPE is a one-byte field. For FE to Host BEGINs it is informational. For Host to FE BEGINs it instructs the FE as to which kind of NCP connection discipline to follow. 1 requests a duplex connection (i.e., that the Initial Connection Protocol of the ARPANET be employed); 2, a simplex connection (i.e., that the appropriate ARPANET "request for connection" Host-Host Protocol command be employed for the gender of the socket at hand). Note that this extended use of the H-FP will be of interest when (and if) user-level programs on the Host begin to use the Network. (The FE will open 8-bit connections at the Network level unless otherwise directed.)

2: ACKNOWLEDGE INDEX CODE

The ACKNOWLEDGE command is multi-purpose. It must be sent in response to all commands from the other machine (other than ACKNOWLEDGEs, of course), and is primarily used to indicate the success or failure of the command just received on INDEX. Note that this implies that each MESSAGE on a given INDEX must be ACKNOWLEDGEd before the next can be sent.

a) INDEX is as above.

b) CODE is a two-byte field. CODE=0 indicates success / acceptance of the command most recently received for INDEX. CODE=1 indicates failure / rejection of the most recent command. (E.g., if a MESSAGE, buffering was unavailable so the other machine must retransmit; if a BEGIN, the indicated protocol / socket cannot be serviced.) CODE=3 indicates an invalid or inactive INDEX has been used. CODE=4 indicates (Host to FE) that no mapping is to be performed on the connection just opened. Other values (for such meanings as "foreign Host down", "undefined type requested" and the like) will be assigned as identified.

3: MESSAGE INDEX COUNT PAD TEXT

The MESSAGE command is employed for the transmission of data.

a) INDEX is as above.

b) COUNT is a two-byte field which specifies the number of bits of data in the TEXT field.

c) PAD is a 1-to-n-byte field. Its width is a per-installation parameter used to enable the TEXT field to start on a word boundary if the local H-FP implementers so desire. (This is not only a kindness, but it's also a placeholder if we decide to go to a flow control mechanism involving sequence numbers.)

d) TEXT is a field wherein byte structure is coincidental. It consists of COUNT bits of data to be sent to the process implicitly associated with INDEX by a BEGIN command (which has not been ENDed).

4: INTERRUPT INDEX

The INTERRUPT command, when sent from the FE to the Host, indicates that an NCP interupt command (INS or INR) has been received for the process associated with INDEX; the Host should interrupt the associated process in whatever fashion is "normal" to it. (The most common use of the NCP command is in Telnet, where it is defined as being the functional equivalent of having struck a terminal's ATTN, INT, or BREAK key, or input a "control-c" on certain character-at-a-time systems; essentially, it requests a "quit button" push. Note that the FE will take care of the associated Telnet control code in the input stream.) When sent from the Host to the FE (in process to process applications), it will indicate that an appropriate NCP interrupt be sent, according to the gender of the socket associated with INDEX.

5: END INDEX CODE

The END command is used to terminate a connection. It may be sent either because one system or the other is about to go down, or because the FE has received an NCP "CLS" command, or because the destination system or IMP has gone down, or at the behest of a Host user process.

a) INDEX is as above. Note that if INDEX=0 the END refers to the "global" connection between the Host and the FE; in such cases, the high-order bit of CODE will be set to 1 and the low-order bits will specify the number of minutes to shutdown if this information is available. (Furnished because the associated IMP often informs the FE of such a condition.)

b) CODE is a two-byte field. CODE=1 indicates the general "close" case (either received or ordered); 2, foreign system has gone down; 3, foreign IMP has gone down; 4, local IMP has gone down. Other values will be assigned as identified.

EXTENSIBILITY

Simplicity and compactness being major goals of the protocol, the small repertoire of commands just presented represent "all there is". Recall that we are specifically omitting from consideration such issues as error and flow control which could turn the H-FP into another Host-Host Protocol. (Should error and flow control prove desirable in practice, we have, of course, thought of some suitable mechanisms within the H-FP framework; but they are not considered germane in the present context.) The primary intention here is to specify a protocol which lends itself to minimal initial implementations in the Hosts, on the same time scale as would have otherwise been required for known-device simulations -- but which offers greater flexibility in the use of the Network than would be achieved through known-device simulation.

The astute reader will have noticed that most of the commands have been specified with an eye toward the future. Because the same protocol which allows the Host and the FE to communicate can easily allow user processes on the Host to use the Network, we have tried to encourage this desirable end by furnishing all the necessary hooks and handholds for it in the FE's H-FP module through the broad definitions of the commands. A Host's H-FP module can furnish a trivial interface for user programs in terms of a very few entry points (open, read, write, and close appear to be the minimal set) and allow the user program considerable flexibility in its use of the Net. For example, a "User" FTP program could be straightforwardly created even for a Host which did not choose to field the BEGINs on socket 3 (necessary for "Server" FTP capability), and files could still be "pulled" to the Host even if they could not be "pushed" to it. (The FE will be required to recognize and special-case BEGINs on socket 3, but that's a small price to pay.) So if the specification of the H-FP command repertoire seems somewhat more complex than it need be, remember that not all of it has to be coped with on any given Host -- and that any given Host can take advantage of more functions as it desires. (Although it's not really within the present scope, we stand willing to invent per-Host H-FP to user program interfaces on request.)

FTP

To amplify a bit on the problem of file transfer, it must be observed that in general only a file system can manage its files. This borders on tautology and is difficult to deny. Therefore, although the FE can shield the Host from a great deal of the mechanism included in the FTP for functions not directly germane to the transferring of files, Host's operating system and place or extract a given file, even though it "has" the file's name available to it. There is no in-principle reason why the H-FP module on the Host can't invoke an appropriate routine when it receives a BEGIN on socket 3, though. (The FE will handle all the type and mode negotiations, pass the "stor" or "retr" line

along, and be ready to transmit or receive on the appropriate socket; but "somebody" in the Host has to receive or transmit the MESSAGEs to or from the right place.) But if that seems hard to do on any particular Host, its H-FP module can merely negatively ACKNOWLEDGE any BEGINs for socket 3. The real point to be noted is that the H-FP still allows in principle for User FTP, as explained above, even so -- and that the simulation of a known device offers neither (User nor Server FTP) function.

(Files could, of course, be transferred into the FE, then somehow gotten into the Host "later" -- perhaps by faking up a batch job -- but that route requires either an awful lot of buffering in the mini or a very sophisticated file system there, or both. It also requires an awful lot of per-Host information in each FE -- or perhaps human intervention. We're not saying it can't be done ... eventually. But it's not going to be clean, or quick, or easy, or cheap.)

SUMMATION

Several important themes have unavoidably been dealt with piecemeal in the foregoing attempt to specify the H-FP in the abstract. To gather the threads together, it might be useful to consider the various ways in which the protocol can be employed, in the context of their ARPANET counterparts. A. "SERVER" FUNCTIONS: There are, in essence, three levels on which a Host can use the H-FP to fulfill ARPANET "Server" functions. 1) For Hosts which choose to take FULL advantage of the flexibility of the H-FP, all "fourth level" (user process to user process) protocols can be managed by the Host. The FE will perform NCP (Host-Host protocol) and IMP-Host protocol functions (the associated IMP will, of course, perform IMP-IMP protocol functions), thus shielding the Host from the necessity of implementing a full-blown NCP with the attendant complexity of being aware of the 11 to 14 "states" of a socket, flow control, retransmission, and the like (as well as shielding it from the IMP-Host protocol, with the attendant complexity of mapping "links" to/from "sockets", dealing with message types, forming and parsing "leaders", and the like). This mode of use is effected by giving the "no mapping" code when the Host acknowledges a BEGIN on sockets 1 and 3 (and by simply accepting BEGINs on all other sockets). 2) For Hosts which choose to take PARTIAL advantage of the flexibility of the H-FP, many aspects of the fourth level protocols (in particular Telnet and FTP) can be managed by the FE on the Host's behalf, by virtue of making assumptions about which Telnet and/or FTP "commands" are to be permitted and only referring such matters as the association of data with processes and/or file names to the Host. (Note that the CODE field of the ACKNOWLEDGE command furnishes the mechanism for conveying such error information as "file not found" from the Host to the FE, which in turn will send out appropriate FTP error messages.) This mode of use is effected by simply accepting (with

code 0) BEGINs on sockets 1 and/or 3 (and doing as one chooses for all other sockets); that is, fourth level shielding is anticipated to be commonplace, and is the FE's default case. 3) For Hosts which choose to take NO advantage of the flexibility of the H-FP, the "private" RJE/batch connection type will still provide for the desirable functions of load sharing and transferring files even though all other fourth level protocols were to be rejected by a given Host (by refusing BEGINs on all sockets other than 77). Even in this most restricted case, the ability to upgrade to either of the broader bases is additively implicit in the H-FP, with no changes required to the FE's own H-FP module -- whereas it would entail considerable alteration of the Host's operating system had the first step been a known-device simulation. B. "USER" FUNCTIONS: 1) On the "User" side, a Host could again elect to handle such fourth level protocols as Telnet and FTP itself. However, particularly in the Telnet case, there is no real need for this, as a User Telnet "comes with" the FE and it is unnecessary to burden the Host with such use unless so many of its local terminals are hardwired that it would be expensive to access the FE directly. (Note that for a User FTP, the Host's H-FP module would, as discussed above, in all likelihood require a user program callable interface.) 2) On a less ambitious level, the FE could be induced to perform the same shielding as it offers the Server FTP (cf. case A2, above), given an "FTP mapping" TRANSLATION-TYPE on the BEGIN command or the previously suggested special casing by the FE on socket 3. 3) Finally, "User" functions could be completely finessed, as per case A3. C. PROCESS TO PROCESS FUNCTIONS: Irrespective of the positions taken in A and B, given only a user program callable interface to the Host's H-FP module, all other fourth level protocols which might evolve -- or, simply, general use of sockets as interprocess communication ports -- can be achieved directly. Again, this would fundamentallly be an "add-on" to the system, not an alteration of existing software.

APPENDIX 2. SOME NOTES ON IMPLEMENTERS

INTRODUCTORY DISCLAIMER

This appendix represents strictly the personal views of one of the authors; I (now that I can admit to being Mike Padlipsky) have not even permitted the other authors to agree with the views expressed here, much less disagree with them, for they are insights which I've gained the hard way during nearly four years of involvement with the ARPANET and I feel they need saying -- regardless of the polite fiction of refraining from finger pointing. Please note at the outset, however, that I am motivated not by a sense of vindictiveness -- nor even of righteous indignation -- but rather by a desire to present some history in the hope that the reader will not be condemned to repeat it. Note also that even though it makes the prose more convoluted than it might otherwise have been, the convention will be observed of "naming no names". I am not, I repeat, out to get these guys; merely to get away from them and their like in the future. (The reader can stop here with no loss to the main argument of the paper.)

SEVERAL HORROR STORIES FROM THE WONDERFUL WORLD OF NETWORKING

Consider first the tale already told of the PDP 15/PDP 10 front ending effort. Having been involved in the writing of both the "old" (1971) and the "new" (1973) Telnet Protocols, I feel a certain sense of shame by association that they were not so compellingly clear that the power of the Network Virtual Terminal / common intermediate representation approach could not have been missed, even by system programmmers operating in pretty much of a vacuum with respect to contact with knowledgable ARPANET workers. Having said that -- and meant it -- I still feel we did a good enough job for average-plus system types to cope with. (The fact that numerous Hosts are on the Net is evidence of this.) Unfortunately, however, average-minus system types do exist and must also be contended with. Therefore, if we do not make a concerted effort to "idiot proof" our protocols, we may anticipate further repetitions of the sad state the site under discussion found itself in before I happened upon them. (And, it must regretfully be observed, support of the "real" ARPANET has deteriorated to the point that the massive effort required to over-explain ourselves probably could not be launched in the prevailing climate. More on this point later.)

Case in point number two is potentially far graver than a mere "philosophical" muddle over bringing one site aboard. It involves an attempt by one of the Armed Services to network a large number of large machines using the ARPANET as a model. The implementation of the software (NCP, Telnet, and FTP) was subcontracted to a well-known software house with no known

ARPANET expertise. The communications subnet and the hardware interfacing to the Hosts was subcontracted to a well-known hardware manufacturer with no known ARPANET expertise. (As an aside, but because it's so startling I can't forbear, the "system architect" for the target network is still another well-known hardware manufacturer (!), with, of course, no known ARPANET expertise.) To make a long, continuing story short, it is currently the case that the "real" ARPANET system whose hardware corresponds most closely to the machines being netted here (even though it is benchmarked at a rather lower "mips" (million intructions per second) rate than the target net's machines) can transfer files at rates in excess of 26,000 bits per second (following the rather cumbersome full ARPANET FTP) from a small configuration development machine to a lightly loaded (but still running in excess of 20 users) service machine one Network "hop" away, while the new system achieves rates which I am apparently not permitted to quantify but are very considerably lower even though only one process is being run on each machine -- also one "hop" away -- and the protocol for file transfer is nowhere near so general as in the ARPANET. Given a year or two, the situation can presumably be rectified, but at present it is fair -- if somewhat fanciful -- to say that if the Japanese were capable of only a like level of technology transfer they'd still be trying to make up their balance of trade with those cute little parasols on matchsticks.

Yet what has gone amiss here in Horror Story 2? I submit that the choice of subcontractors was based upon a misapprehension of the level of technological sophistication associated with the ARPANET, and that what was (is?) needed is a subcontract to a knowledgable ARPANET source (and I don't mean to the usual, profit-making place -- though I guess I trust them for the subnet), rather than to "outsiders". (I don't even mean to any particular place on the Net; maybe what's needed is to form a meta-place out of the whole Net. More on this, too, later.) The real point is that the model was essentially ignored by the putative model-followers, and -- demonstrably -- it shouldn't have been.

Case three should go a long way toward dispelling any impressions that might be building in the reader's mind that I'm some sort of hardcore ARPANET chauvinist. For even "insiders" have blown some. This is actually a dual case, for it involves two unsuccessful attempts to furnish terminal support mini-Hosts for the Net. In one case, the choice of machine was faulty; even with additional core memory field retrofitted, buffers cannot be furnished to support reasonable data rates without imposing considerable unnecessary Host overhead in the processing of too frequent Host-Host ALLocate commands. Nor is there enough room to furnish more than a rudimentary command language in the mini. Now these were knowledgable, reasonably well managed "insiders" -- but they were contractually not in a position to heed the technical intuitions of several of themselves and the technical

intuitions of many of their colleagues throughout the Network Working Group that they'd been painted into a corner.

In the second sub-case, the hardware and contractual obligations appear to have been right, but ill-considered choice of implementation language and inadequate management have prevented the project's full completion to this time (some two years after its inception). Again, there was forewarning from the NWG, in that we had tried to alert them quite early about the language issue. (On the management level, we could only sympathize -- and in some cases empathize -- but it is at least a tenable position to take that the ARPANET as a whole happened despite, not because of, Management.) (I guess I am an ace system programmer chauvinist.)

The final case to be cited here involves another military effort. This one I'm not even sure I'm supposed to know about, much less talk about. But I can say that it involves a subcontractor's attempt to attach several special purpose machines to a major ARPANET server by means of an internally invented set of machines and protocols. My information suggests that when asked why they failed to follow the apparently obvious course of using ARPANET technology (facilities for which do, of course, already exist on the target server), the subcontractors essentially replied that they hadn't felt like it. They also haven't made their approach work yet, and it's been something like a couple of years they've been trying.

Then there's the fad to simulate RJE terminals ... but to use that as Horror Story 5 would be begging the question -- for now.

SOME MORALS

Rather than search out any more dirty linen, let's pause and look for the lessons to be learned. In the first place, it borders on the obvious that for any technical project the "right" technicians must be found and empowered to perform it. Despite the generation of over-sell on the "power of computers", they still absolutely require intelligent, competent programming -- which in turn requires intelligent, competent programmers. And, at the risk of gilding the ragweed, not all self-professed programmers are intelligent and/or competent.

In the second, and more interesting, place, all unknowing the ARPANET has attracted or engendered an "in-group" of extremely good system types -- who have learned through some sort of natural selection process to work well together despite the immense handicap of the heterogeneity of our various "home" systems' assumptions. We not only have developed a common tongue, but some of us even like each other. (It should be noted that Appendix 1 was specified on a Wednesday afternoon and a

little bit of a Thursday morning. Jon and Jim and I had been there before.) It seems quite clear to me that the organizations for whom this report is intended should avail themselves of the expertise which exists in the NWG; We've got a reasonable track record, after all, especially in comparison to others who have attempted networking. Many of us also feel quite strongly that we didn't get a chance to finish the job on the ARPANET, and would like to be given the chance to "do it right" -- especially in view of the errors which have been committed in our name. (This is particularly important because the old gang is beginning to scatter. For myself, I expect this will be my last RFC. Well, at least I've tried to make the most of it.) The ARPANET is no more a finished product than ANTS or ELF -- but all of them could and should be.

In the final place for now, a rather trite moral must be drawn: Technical competence is extremely difficult to assess a priori. (I'm inordinately fond of saying "Don't ask me what I'm going to say, I haven't said it yet" myself.) But "track records" ARE important, and competence CAN be demonstrated -- to a suitable jury of technical peers. Therefore, beware of plausible sounding subcontractors who tell you "It's easy". In our field, and particularly in getting all those strange machines which were developed by people who by and large didn't talk to each other to "talk" to each other, it's NOT easy. I'm willing to claim that it will be easIER letting some NWG types do it with the H-FP approach, but it might never be really easy -- where "never" means for the next 10 years or so, until "real" networking comes off the shelf with the operating system (which itself scarcely comes off the shelf today) -- but don't get me started on The Manufacturers.

BEYOND THE PAIN PRINCIPLE

So it's not easy. It's also not impossible. Indeed, the time appears to be ripe right now to avoid generating a whole new generation of horror stories, by sensitizing decision makers to technical realities and "doing things right" this time around. Having seized this occasion to say some things to that end which I think are important, I must in good conscience stand ready to defend the assertions I've made of error in some camps and of correctness in what I might loosely call "our" camp. I do so stand, with a right good will. If any reader desires more corroborative detail -- or merely to see if I rant like this in contexts other than RFCs (or even to have a go at my explanation of the common intermediate representation principle), well, I'm still in the ARPANET Directory -- even though the phone number's different (try 703-790-6375). The mailbox remains accurate (even though there is no "ARPANET mail protocol"; it's marvellous how stopgaps endure).

MIKE 3-OCT-74 14:18 31118

resend of 23-SEP-74 sndmess re L-10 support and Bell Canada

Jim, colcould we Get together on your next swing through here (next week ?) and discuss this ?

MIKE 3-OCT-74 14:18 31118

resend of 23-SEP-74 sndmess re L-10 support and Bell Canada

Jim, Penny's having a hell of a time getting any questions answered regarding the L-10 work she is doing on our information retrieval package.
Dean hs been understandably preoccupied for much of the past month, but surely there is someone else that we could go to for guidance in developing some of the executable programs that will be a part of the system. I asked Dean if he could refer us to anyone else at ARC, and he sort of ducked the issue, indicating that he was too busy himself to help much, but not coming up with an alternative name.
The only reason I'm bringing this up myself, rather than Penny's doing so, is that we're a little concerned that some of your people there con't realize the time constraints we're working under here. Penny had much of the past month free to work on the info,ret, program, but was hung up on a few fundamental problems. Repeated messages to Dean (requesting that Dean link to her, requesting answers to specific questions, etc.) went unanswered. (Not acknowledged.....just unanswered).
Penny's schedule is filled up for the next several weeks, and she won't be able to touch the info,ret, program till early October. I hope that by this time we will have been able to establish a workable procedure whereby this group can obtain L-10 support in a dependable fashion.

1

DLS 4-OCT-74 07:52 31119

JOVIAL Manual Status

Nelson and Mike Landes have taken a look at the 3rd JOVIAL COM run, and feel that the page is too "busy". By that they seem to mean that with the font size at 10p and continual changes in fonts, the page looks like one black mass and is difficult to read. They have made a decision to try 11 point for the body of the text. This means little in terms of directives (a 10 has to be changed to an 11), but it means quite a bit in terms of realigning the tabstops, etc. in the equations and tables. It might be best to do just a few pages, to make sure that this is what they want, before proceeding further. Also I will use PxFShow, PxFYD directives on the first two levels to make sure that there is adequate space between the chapter numbers, titles and the body of the document. I don't expect that I will get to this until next week, Thurs or Fri.

RMS2 4-OCT-74 08:43 31120

Your reaction to the new NLS-8

It has been about 3 weeks since we all met for the semiannual KWAC conference and by now we should all have some feel for the new version of NLS (PREVIEW). We should have developed some degree of familiarity with this system and should therefore be in a position to offer some comments, suggestions and/or advice. This is an attempt to solicit that advice,comments and suggestions so that we (KWAC) can organize them and present them to the developers at SRI. It is hoped a unified community , such as ours, can have some degree of influence on the development of this system. 1

Some areas to consider commenting on are listed here. Please feel free to add your own and any other aspects of the system you feel need discussions. 2

SYSTEM RESPONSE TIME 2a

PROMPTS (to many? meaningful?) 2b

COMMANDS (to complex? better in DNLS?) 2c

FEEDBACK (response time?) 2d

SUBSYSTEMS (is HELP really useful?) 2e

USER PROGRAMS 2f

SYSTEM BUGS 2g

DOCUMENTATION 2h

When a number of users respond to this letter we will merge your comments and then mail you a copy for your additional consideration,Can you please give this matter some serious consideration and respond within the next few days 3

regards, 3a

Bob Sheppard/ Connie McLindon 3b

Comments on New NLS

This file has two purposes: 1

Give me a file to play with while I learn NLS-8 1a

To document some of my findings as I go along. 1b

NOTA BENE: THIS IS A PERSONAL FILE WHICH I MAY CHOOSE TO MAIL FOR THE PURPOSE OF LETTING SRI KNOW MY REACTIONS. TAKE THE COMMENTS IN THE SPIRIT IN WHICH THEY ARE OFFERED. THERE IS NO INTENT TO SLANDER OR LIBEL ANY INDIVIDUAL OR ORGANIZATION, EXCEPT POSSIBLY 'THEY' WHICH IS UNDEFINED AND INDEFINITE. 2

MATERIAL PRECEDING THIS HAS BEEN SENT TO FEED, 3

30 Sep 74 (Cont'd) 4

I wanted to be able to combine the control e feature for continuing to insert statements with the levadj numbers on, But I am unable to find the feature in the NNLS, The combination would be ideal for people who input a lot of material and are not very experienced or facile on the TTY type terminals, I hope the levadj numbers on command will reappear sometime, if it is not already there. 4a

1 Oct 74 5

I sent some mail late yesterday. Today before going to NLS I deleted three files, one of which had been journaled and sent out. I decided not to expunge until I checked to see if the Author copy was in my initials file. It was not. I congratulated myself on my foresight in not expunging. In a later session, immediately after logging in I typed dsk followed by dir. The three files were gone from my directory but there were no pages deleted. I tried to undelete the file, but it was gone. However, in the meantime the link had appeared in my Author branch so nothing was lost. You don't have an automatic expunge setup do you? 5a

4 Oct 74 6

Viewspec y completely blows the mind of the IMLAC, 6a

If you use the set viewspec command aand set y it blows the program 6a1

If you hold down the two buttons on the mouse and put in the yf you get the same result, 6a2

If you jump to something and put in the y viewspec same thing, 6a3

Comments on New NLS

Just a few minutes ago I tried to update a file after making a substitution (there were 68 made). After about five minutes of inactivity I tried a control t. I found that procesing was susppended and the load was 2.5 (approx). A little later the load was over 6 and processing was still suspended. I tried to get out of it by using a control c, to no avail. So I had to sit and wait it out. Is there nothing to do when you are suspended except to wait it out??? 6b

Sometimes when there is a goof and a line or two or some characters get dropped. In the old NLS, the display could be reformatted by holding down two buttons on the mouse and typing an f. In the NEWNLS the f has no effect whatsoever, except in conjunction with a change in viewspec. I don't know if this is an IMLAC unique problem or what. 6c

Impressions--NLS-8

I'm glad that you are organizing a little KWAC activity,.If you didn't I was going to. I have a few comments below, listed under your headings, 1

TRANSITIONING,.NLS-7 to 8 1a

With the system response times being what they are, I want to again register a vote for as short a transition time period as possible (overnight??). We will be doing our training at night (after 17:00), to ease the system load during transition. 1a1

SYSTEM RESPONSE TIME 1b

The reponse time has been outrageous during normal working hours. Clearly the current group allocation scheme is not doing its job, ie, keeping the load within the 4-5 range. It could be because there are two NLS systems running simultaneously, however SRI has not confirmed this. Other possible reasons given by Norton are: 1b1

additional use due to people coming back from vacation, 1b1a

shift in type of use to heavier CPU consuming processes, ie Output Processing, L-10, Processing Command Branches, 1b1b

TYMSHARE running print jobs during the day and 1b1c

mulitiple off quota jobs running under a single group. 1b1d

The prediction was made that Office-1 could support 18 users gracefully (based on experience with the ARC machine and the asumption that Office-1 users would not place quite as heavy a load on the system). Since the inception of Office-1, 5 additional slots have been added, along with additional core, with the hope that the original assumptions were still valid. 1b2

It is quite clear that the predictions made earlier are not comming true in practice. There is some feeling that the smaller drum at the Office-1 facility may play a major role in reducing the rsponse time, but this has not been verified. Increasing either the size of the drum or the core should reduce the number of swaps necessary and therefore lower the load, 1b2a

What seems to be emerging is the realization that the Office-1 facility cannot support 23 slots gracefully when they are all in use. This could well mean a reduction in the number of total slots which can be made available,,,or looked at another way, an increase in the cost per slot. It is probably

premature to make this judgement at this time. However, I would suggest an active analysis effort be undertaken by SRI during the remainder of the Office-1 contract (until Jan 74), so that we can be closer in predicting preformance on Office-2, 3, 4, etc. 1b3

PROMPTS 1c

The prompts are useful in learning the new system. I am about at the point where I am ready to turn them off. I find myself not looking at them and therefore sometimes getting myself in trouble. When I am in an unfamiliar part of the system, I wish there was an easy way (like a viewspec) to have them turned back on without going to the Useroptions subsystem. I often find the NOISE WORDS more helpful than the prompts. 1c1

The heavy system load destroys some of the usefulness of the prompts in the learning process. I find myself leading the system, making erroneous inputs, then getting the prompt which gives me a clue to what it should have been. This causes a lot of backtracking. It could be that this is good negative reinforcement to the learning process! 1c1a

COMMANDS 1d

Load File--It took me a few tries to discover that <directory>filename won't work, where as directory,filename does. No big deal, except old users will have to unlearn that habit. My biggest complaint is that I can't set the viewspecs when loading a file. THIS I MISS! Why can't this be restored? 1d1

Force Case--I find Force (case) STING/STRUCTURE about as un-natural as Xset. I only use it to capitalize entities, as I suspect most others do, since uppercase is the default. It would seem to me to be more natural to say CApitalize STRING/STRUCTURE. The other modes could be obtained by saying SEt CAse (mode) to Upper/LoWer/Initial. LikeWise they could be reset. I realize that the grammar of this command would be a little awkward when someone was in the lowercase mode, but I wonder how often anyone really uses that. 1d2

Or how about CHange (case of) STRING/STRUCTURE (to) Upper/Lower/Initialupper?? 1d2a

Expunge Directory--I think this should echo Expunge Deleted files. It gives one a horrible sinking feeling to think that his whole directory might disappear. 1d3

Copy Branch/Plex/Group--When I make a copy from another file

using the link form of an address, why can't the system listen to any viewspec that might be in the link. It seems to ignore the view spec in the link and make me type "U and the viewspec if I want a filtered copy. 1d4

Speaking of links---Is there a historical or other reason for delimiting the viewspec field of the link with a ; Why not a , like the other fields?? 1d4a

FEEDBACK 1e

System command feedback is good,,I like most of the noise words. I have noticed a definate improvement in the retrieval of archived files (thanks BOb). User feedback generally responds with a day, which is reasonable considering some of the dumb questions I ask. From what I have seen of the cataloging of messages and mail sent to FEEDBACK, it looks like it is being well organized, and that there is a systematic means of dealing with its diversity. Desired system changes aren't always immediately forthcomming, but I can understand why and am not bothered by it. 1e1

SUBSYSTEMS 1f

HELp 1f1

Still a little shakey,,,Occasionally gives erroneous information,,,Sometimes gets caught in a loop and can't get out, but was definately useful to me in a number of cases where I couldn't figure out the input expected of me from the ? facility. Overall, I think its an excellent idea and when properly patched up, should answer 90% of the questions I now get from beginners and intermediates. I like the ability to guess at a Keyword that might contain some info I need, thus bypassing several levels of stuff that I already know. I think it can replace the reference manual altogether, with a little more work. I'm glad the Show went away,,it was really unnecessary. 1f1a

CALCULATOR 1f2

I haven't been able to find the Caculator Subsystem yet,,either as a subsystem or as a userprogram. 1f2a

SENDMAIL 1f3

I think that Interogate should be the default of the Sendmail Subsystem, if it was cleaned up a little. 1f3a

In general agreement with the "from-to" kind of changes in the editor, I think that Interogate should first asked what is to be sent, then ask for the title and last ask for the distribution list. 1f3a1

When I try to back out of the (distribute for action to) by using a ^H or ^X, it throws me out of the Interogate mode altogether. It should go on to the next command. I also feel that the order of action and information should be reversed. 1f3a2

The noise words (type of source), asking the user what he wants to send, is not very self-evident. How about changing it to (Send S/B/P/G/F??), or something else that indicates the entry expected from the user at that point. 1f3a3

I was anticipating the unrecorded command would send the mail as a TENEX SNDMSG. This would be neat, since it would eliminate fliping back and forth between TENEX and NLS, creating sequential files, etc. I imagine that this would take a little programming effort to make happen, but I think it would be a good feature. Somehow it seems desireable to wrap all the mail handling stuff into one package. 1f3b

IDENTIFICATION 1f4

I think that we should aim for the day when the identification files are maintained by the archetects at each site. People come and go, change organizations, phone numbers, etc, with too high a frequency for a central coordinator to ever handle. 1f4a

USER PROGRAMS 1g

A quick survey of the local more experienced users, indicates that the following userprograms have been or are being used.,(about 80% of all listed in the user-progs directory). We should pressure SRI to make sure that they ar all compatable with NLS-8. I can give my priorities if necessary. 1g1

< USER-PROGS, -CONTENTS.NLS;14, > 1g1a

< USER-PROGS, -USERGUIDE.NLS;3, > 1g1b

< USER-PROGS, ADDNAME.CA;1, > 1g1c

< USER-PROGS, ADDRESS.REL;1, > 1g1d

< USER-PROGS, ADDTEXT,REL;1, > 1g1e

< USER-PROGS, APPEND,REL;2, > 1g1f

< USER-PROGS, DELCOL,REL;1, > 1g1g

< USER-PROGS, DELDIR,CA;1, > 1g1h

< USER-PROGS, INDEX,REL;1, > 1g1i

< USER-PROGS, INDEX,NLS;3, > 1g1j

< USER-PROGS, INSEQH,REL;1, > 1g1k

< USER-PROGS, JFORM1,CA;3, > 1g1l

< USER-PROGS, JFORM2,CA;1, > 1g1m

< USER-PROGS, JFORM3,CA;2, > 1g1n

< USER-PROGS, LETTER,REL;8, > 1g1o

< USER-PROGS, MAKEREF,REL;1, > 1g1p

< USER-PROGS, NOTABS,REL;1, > 1g1q

< USER-PROGS, SENDMES,REL;1, > 1g1r

< USER-PROGS, SHOWDIR,CA;1, > 1g1s

< USER-PROGS, SORTMES,SK;1, > 1g1t

< USER-PROGS, SORTNMSKP,SK;1, > 1g1u

< USER-PROGS, SORTNOCASE,SK;1, > 1g1v

< USER-PROGS, SORTNUM,SK;1, > 1g1w

< USER-PROGS, SORTREV,SK;1, > 1g1x

< USER-PROGS, SRIFORM,CA;1, > 1g1y

< USER-PROGS, SRIFORM,NLS;1, > 1g1z

< USER-PROGS, TOC,REL;4, > 1g1a@

SYSTEM BUGS 1h

This is just a copy of a file where I have been recording some

bugs...some unique to the IMLAC terminal I'm using and some already fixed. There are others which I haven't recorded, or which have gone to feedback via sndmsg. 1h1

The control 6, which activates the screen in NLS, isn't automatically sent...one must manually insert it. 1h1a

The screen width should automatically be set to 62 at the TENEX level when the terminal type is given as IMLAC. This would prevent messages, links, etc. at the TENEX level from wraping around and writing over. 1h1b

I have been unable to send a file to the printer on our TIP (using NLS-8) with the Output Remote command. After typing O R 1h1c

I get the error message "<stone>0,222-1000002 is busy", when I give the TIP number, 146. 1h1c1

I get the error message "NLS internal error: string too long", when I type the file name or bug it. 1h1c2

What does the system expect to see after typing the O R ?? A TIP number or a file name or neither of these? The help data base wasn't too helpful in this case. The command summary document (,23912,124) just indicates CONTENT at that point in the command. 1h1d

The output sequential file command now works in NLS-8 (thanks Dave). I am still unable to do an Output Remote or an Output Terminal command, however. Whenever I want to output a file that pays attention to directives I have to drop back to NLS-7 I recorded my attempts at doing this (simulating a TI terminal). They are contained in the file <STONE>RECORD.CTL;1 Play it back and you will see the type of error messages I get. 1h1e

When I try to Insert, Copy, Move a NUmber; the destination bug will only be accepted when I bug a number. When I bug a visible other than a number or when I bug an invisible, I get the error message, "invalid number selection". 1h1f

I tried using the Output Printer File command in DNLS, and was flipped to TENEX with the following message 1h1g

ILLEGAL INSTRUCTION JSYS SUBNM1+10 = 104000,,200 at PROCESS+247 = 21335 Your turn. 1h1g1

PS...I got the same error message while trying the Output Terminal command (simulating a Ti). 1h1h

I tried the Output Remote command and got the message "NLS System Error" 1h1i

DOCUMENTATION 1i

I found the command summary adequate for checking out all the new or changed commands that were unfamiliar to me. Its clearly not adequate for training or reference. 1i1

I am indirectly familiar with the problems of documenting a system as complex as NLS. I have seen all the effort that has gone into a comprehensive reference manual for NLS-5, 6, 7. Despite the dedication and long hours of the people preparing it, it seemed always to be out of date and difficult to find the help needed. 1i2

Once the special documentation necesary for the transition process is produced, I WOULD HEARTLY RECOMMEND THAT SRI CONCENTRATE ALL ITS EFFORTS ON THE HELP SUBSYSTEM, and not attempt to develop an off-line reference manual. Once the damn thing is frozen and printed, the updating and distribution problem is impossible, not only for SRI, but for the using sites. We always had trouble finding the copies of the manual, and determining if it had been updated before. 1i3

RSR 5-OCT-74 17:26 31123

problem with preview viewspec

In this preview 5:15 pm pacific saturday 5 Oct, Viewspec w is not working for me it skips a page full of lines between statements, and only prints first lines. Have you changed the viewspecs on me? If so please send me a new cue card or viewspecs card or whatever. If not, what gives? 1

RSR 5-OCT-74 18:42 31124

smokesignal

Couldn't seem to find you in BOS. Looked under all the most likely rocks, but.... I would like to talk to you in the next few days, by phone, on two subjects: (1) is the revenue /cost spreadsheet stuff I've been working on. (2) is DCE's somewhat upset-sounding journal item (24154,3 Oct) and its relevance to the pricing schemes we've been talking about. Office or home(948-7714) or sendmsil where I can call you and when. Bye.

WFS 7-OCT-74 11:00 31125

Message to Dr Fields from Don Elefante

The memu for this evening will contain the following: Chicken, Turkey,Shrimp, Corn, Pie, Ice-Cream. In particular, the chef has chosen to tittleyour gustatory faculties with fried chicken, stuffed turkey, shrimp gumbo,corn on the cob, apple pie and anilla ice cream. You may contact t chef directly by alling any of the following numbers (AC 314)+ 337-0500, 337-0501, 330-2955, 330-2988, 330-49871, 330-7149. If you don't understand the chef (he talks at 150 words/min, with a heavy accent) you may call me t 330-2319. 1

Corrections to message to Dr Fields

Corrections to message to Dr Fields from Don Eklefante, Hyphen between words"Ice" and"Cream" should be an underscore, Telephone number 330-49871 should be 330-4871 1

Journal Mail - Third Quarter 1974

(haug) 1

(RJC) 8-AUG-74 13:14 30990 1a

Message: The system will be down all morning on 14 aug, wednesday for repairs. 1a1

Comments: ...duayna 1a2

(RJC) 8-AUG-74 08:35 30988 tickler
(MJOURNAL, 30988, 1:W) 1b

Comments: ...DONNA 1b1

(RJC) 8-AUG-74 08:26 30987 NEW PROCEDURES 1c

Message: Subj: Submission of Items for Weekly Lab Activity Report NEW PROCEDURES: Just submit title of item and name of the responsible engineer to me on a buck slip NLT Wednesday of each week. This will then be coordinated with DOT/D, Craig, who, if the item is determined to be acceptable, will get together with the engineer to prepare a writeup. This item should still be coordinated with the respective branch chief. 1c1

Comments: ...DONNA 1c2

(RJC) 7-AUG-74 08:25 30978 5 -Aug 1974 1d

Message: Subject: Management Assessment Review Schedule - In view of the new trial procedure for Management Assessment Reviews (MARs) (involving incorporation of Management Assessment Reports into the -Executive Management Review (EMR) and accomplishment of detailed reviews only for programs designated by the -Commander at the EMR), the MARs previously scheduled to be accomplished by IR, IS, and RB are cancelled. 1d1

(NDM) 6-AUG-74 07:44 30973 Answer to 30944: Output Processor Directive Problem 1e

Message: Duane and Ed: Sorry to be so long in getting back to you on your directives problem. You were right to look at the PxF directives, but you didn't quite get them right. Those guys are pretty tricky. Try:

The Output Processor Users' Guide lists the defaults for those three parameters, and shows their general form. Let me know if you have any further trouble with the little devils! --Dean 1e1

(RJC) 5-AUG-74 06:57 30965 1f

Message: From now on, all work will be done in Bobbie's

directory and later (when the work is completed), be transferred into your directories. This is upon the request of Roger Panara. 1f1

Comments: Sharon 1f2

(RJC) 2-AUG-74 07:42 30962 -Tickler 1g
(MJOURNAL, 30962, 1:W)

(NDM) 1-AUG-74 12:10 30959 Content Analyzer: If a Statement 1h
(MJOURNAL, 30959, 1:W) passes, pass that whole branch.
Comments: Substitute a content analyzer pattern in for %%%pattern%%%, then compile and institute as content analyzer. 1h1

(hjul) 2

(RJC) 25-JUL-74 06:50 30946 Farewell Luncheon 2a
Message: Farewell luncheon for Major William Patterson on August 1 - Coalyard Charlies - 12:00 noon - $3.50 includes everything - contact Henry Power or Ceil Friedman 2a1

Comments: ...,DONNA 2a2

(RJC) 25-JUL-74 06:48 30945 Demonstration 2b
Message: On 30 July 1974 at 0930 in the Display Facility, Bldg 3, there will be a demonstration of teletype corporation's model 40 data terminal systems which consist of a display - 24 x 80 and high speed impact printer up to 314 lines per minutes. For further information on the demonstration of the model 40 system, contact Frank Triolo X2242. 2b1

Comments: ...,DONNA 2b2

(RJC) 24-JUL-74 07:16 30942 tickler 2c
(MJOURNAL, 30942, 1:W)

(RJC) 22-JUL-74 07:10 30936 SPEAKER 2d
Message: Dr. Pennington, SDC, 24 July - 0900 hrs. - Conf. Rm 1A Re: Software Productivity and Cost Estimation - Focal Point Robinson 2d1

(RJC) 19-JUL-74 10:52 30933 2e
Message: Dr. Pennington, SDC, 24 July - 0900 hrs. - Conf. Rm 1A Re: Software Productivity and Cost Estimation - Focal point Dick Robinson 2e1

(RJC) 12-JUL-74 08:03 30929 MEETING NOTICE 2f
Message: MEETING NOTICE: 19 July 74 focal point, Rocco Iuorno - 0930hrs. - Conf. rm. 1 - Bldg. 3 - Speaker: Dr. Eldred C. Nelson, TRW, Redondo Beach, Calif. - Topic: Mathematical Representaion of Logical Properties of DM-1. 2f1

(DLS) 8-JUL-74 11:05 30922 JOVIAL Manual--COM Statement of Work 2g
(MJOURNAL, 30922, 1:W)
Comments: Unless there are changes up-line, this will be the SOW for the JOVIAL manual job...Project 5550, eng. change to 0076 (Workshop Utility Service). 2g1

(hjun) 3

(RJC) 20-JUN-74 05:50 30893 3a

Message: Wine and cheese party - Charlie Breece - $2.50 per person - Display Facility - 1700 Hrs. - see Marilyn Rossi X7009, Tickets NLT 22 June. 3a1

Comments: 28 June 3a2

(RJC) 17-JUN-74 12:52 30883 when ISI confessions are 3b

Message: ISI Confessions 0830 hrs. 3b1

Comments: Confessions are held on 19 June, Wednesday 3b2

Messages - Third quarter 1974

(aug) 1

28-AUG-74 1118-PDT LAFORGE: library,tycom
Distribution: MCNAMARA, Kennedy
Received at: 28-AUG-74 11:18:29 1a

As far a s iI know the TYCOM's are all in working order since last week, However, I never heard anything about ging onne to stinson, I would prefer to wait until stoney or ejk get back so we can discuss the idea, re the library, we are talking about several approaches and ideas about indexining the documents with a xreference scheme of some kind showing specific locations of the documents, 1a1

28-AUG-74 1137-PDT LAFORGE: library
Distribution: KENNEDY, stone
Received at: 28-AUG-74 11:37:00 1b

I have read your little entry file and looked at the sample references which would be typical of the crap the girls would be inputting, However , there does appear to be some confusion with respect to the vehicle that is to be used to support the library system, Mac is of the opinion that we should use a subset of the current RAD Library existing as of now in the Journal system, I think that you and I , Roger and Stoney need to talk about the problem, Seeing as i got handed the job, by fiat, w
will come together and resolve our differences! There will also be the purely physical problems of space for the documents, how to iindex them and where the hell are the bookcases, That will be tom's job i suspect! 1b1

21-AUG-74 1645-EDT GRIGNETTI at BBN-TENEXA: NLS-SCHOLAR
Distribution: KENNEDY AT OFFICE-1, stone at office-1
Received at: 22-AUG-74 03:39:57 1c

(,scholar,3:xb) for content of message 1c1

21-AUG-74 1018-EDT GRIGNETTI at BBN-TENEXA: NLS-SCHOLAR
Distribution: KENNEDY AT OFFICE-1, stone at office-1
Received at: 22-AUG-74 03:40:08 1d

(,scholar,3:xb) for content of message 1d1

20-AUG-74 1633-EDT GRIGNETTI at BBN-TENEXA: Net mail from site BBN-1D
Distribution: KENNEDY AT OFFICE-1, stone at office-1
Received at: 20-AUG-74 13:38:18 1e

(,scholar,3:xb) for content of message 1e1

20-AUG-74 1404-PDT MARTINEZ: ON WHETHER OPER AND MARTINEZ ARE SYNOMOUS
Distribution: KENNEDY
Received at: 20-AUG-74 14:04:54 1f

SOMETIMES YES BUT SOMETIMES NO,
BOBM 1f1

20-AUG-74 1113-PDT KENNEDY(EJK) at OFFICE-1: Telephone numbers for use with the terminal
Distribution: THAYER, BARNUM, ACD(DECONDE), EJK(KENNEDY)
Received at: 20-AUG-74 11:13:22 1g

Telephone numbers to connect to the ARPANET and then to NLS via the TIP: 1g1

4172 4173 4174 4175 4176 4177 1g1a

4293 2073 4777 2884 1g1b

3300 3302 3600 3613 3733 1g1c

TelePhone numbers to connect with the TIME SHARING SYSTEM: 1g2

30 Baud 1g2a

7796 2397 2447 2448 2450 4277 1g2a1

15 Baud 1g2b

7795 1g2b1

10 Baud 1g2c

3091 1g2c1

7651 1g2c2

20-AUG-74 1030-PDT MARTINEZ: ARCH REQ (!?)
Distribution: KENNEDY, oper
Received at: 20-AUG-74 10:30:18 1h

IT IS MY FEELING THAT THE PROMPT "DO YOU WANT (THE FILE)RECOVERED
PRESUMES IT WILL BE WORKING ON ONE AND ONLY ONE ARCHIVE LOCATION
STRING; THUS IN THE TWO FILES YOU SOUGHT IT COULD NOT GET PAST

THE
SITUATION WHERE TWO ENTRIES EXISTED FOR EACH FILE (THAT IS, THE
REFERENCED FILES ARE ARCHIVED BOTH HERE AND AT SRI-ARC), IN ANY
CASE
THE LETTER TO OPER (MAY I SUGGEST COPYING MARTINEZ) GOT THE
NECESSARY INFO TO US AND BOTH FILES ARE NOW BACK ON LINE FOR
YOUR USE.
THANX
BOB MARTINEZ
TYM/OFFICE-1 1h1

20-AUG-74 0510-PDT CARRIER: Due Dte
Distribution: KENNEDY
Received at: 20-AUG-74 05:10:57 1i

See Marcelle for the Extension of the Due date,,,Bobbie 1i1

9-AUG-74 1610-PDT BAIR at SRI-ARC: Dimaggio Directory
Distribution: KENNEDY AT OFFICE-1, feedback at office-1
Received at: 9-AUG-74 16:13:03 1j

Ed, It should work now for the 3 idents you mentioned. Jim 1j1

9-AUG-74 1152-EDT GRIGNETTI at BBN-TENEXA: CLARIFICATION
...(FOR REAL)
Distribution: KENNEDY AT OFFICE-1, stone at office-1,
grignetti
Received at: 9-AUG-74 08:54:44 1k

(,scholar,3:xb) for content of message 1k1

8-AUG-74 1403-EDT AIGHES at BBN-TENEXA: Clarification of Work
Statement,
Distribution: KENNEDY AT OFFICE-1, stone at office-1
Received at: 8-AUG-74 11:14:12 1l

8-AUG-74 1152-PDT LAFORGE: resources
Distribution: KENNEDY
Received at: 8-AUG-74 11:52:18 1m

Daughtry is no longer a cobra dane available type, who is his
replacement? Lombardo has not been working on the program! I,
e, laforge am the only one programmed for any support in fy 75,
and that is only .1 m/y. It involves us in cleaning up the
operator/interaction/display effort. this should be finishe d
in october. 1m1

8-AUG-74 1022-PDT BAIR at SRI-ARC: INMES
Distribution: STONE AT OFFICE-1, KENNEDY AT OFFICE-1, MATTIUZ

AT OFFICE-1,, MCLINDON AT OFFICE-1, LEE AT OFFICE-1, NORTON AT OFFICE-1, bair at office-1
Received at: 8-AUG-74 10:23:07 in

INMES now works without the additional step of setting buffer size. We increased the standard buffer size to accommodate the revised INMES program. Sorry for the inconvenience if you tried to use it. ini

8-AUG-74 0815-PDT CARRIER: ARPANET DIRECTORY
Distribution: STONE, KENNEDY, PANARA, LAFORGE, MCNAMARA, carrier
Received at: 8-AUG-74 08:15:13 io

We went through the ARPANET DIRECTORY dated June 74 and updated it. We sent a copy to NIC at SRI-ARC. This is for your information. ioi

7-AUG-74 0936-PDT FEEDBACK: Journal msg 30949, 26 jul
Distribution: KENNEDY, feedback
Received at: 7-AUG-74 09:36:13 ip

Ed, their was no msg or link, just an empty message field???? Recieved a nice letter from the Christians,,,sounds like they are going to play monopoly. Jim ipi

6-AUG-74 1421-PDT KENNEDY(EJK) at OFFICE-1: Duedate
Distribution: ELF(LAFORGE), EJK(KENNEDY)
Received at: 6-AUG-74 14:21:34 iq

TODAY 7 Aug Afternoon, iqi

Get reply in to FJT on Commitment of RADC Resources - ELF iqia

The only ones of which we are aware are: ELF, Lombardo, Daughtry - COBRA DANE and something Rzepka is doing for IR iqib

6-AUG-74 0853-PDT BAIR: Error msg when loading program INMES
Distribution: KENNEDY, stone, mattiuz, norton, bair at sri-arc, lee, mclindon
Received at: 6-AUG-74 08:53:23 ir

Ed, Turns out that you now have to set the buffer size to 6 to run ZINMES, according to Dean Meyer, the author of this useful program. "Goto Programs Buffer size 6 <CR>". I'm sending this to seasoned architects so that they may help users at their sites. Jim iri

5-AUG-74 1318-PDT CAVANO: avy Nipper

Distribution: STONE, KENNEDY, MCNAMARA, BUCCIERO, cavano
Received at: 5-AUG-74 13:18:24 1s

Dave Craig called Kennedy and wanted to know if a Nipper from the Navy has come in, I guess he wants to know some info like what the project no. is, etc. If you have any knowledge, give him a call. 1s1

4-AUG-74 0026-EDT GRIGNETTI at BBN-TENEXA: TENEX PROBLEMS
Distribution: KENNEDY AT OFFICE-1, stone at office-1
Received at: 5-AUG-74 18:37:41 1t

ED, 1t1

OUR TENEX SYSTEM HAS BEEN VERY SICK SINCE LAST SUNDAY (A WEEK AGO).
IT IS NOW UP MINUS THE DRUM, WHICH MAKES IT LOOK LIKE THE QUEEN MARY
WITH AN OUTBOARD MOTOR. I'LL GET BACK TO YOU WITH MY DETAILED COMMENTS
ON THE SOW WHEN I GET TO WORK ON MONDAY (I'M NOW AT HOME AND VERY
SURPRISED TO FIND THE SYSTEM UP). PLEASE FORGIVE THE DELAY. 1t2

MARIO. 1t3

1-AUG-74 1429-PDT BECK at SRI-ARC: SRI-ARC/Office-1 TENEX Users Guide
Distribution: STONE AT OFFICE-1, kennedy at office-1
Received at: 1-AUG-74 14:30:03 1u

Dean Meyer has asked me to send 6 copies of our users guide to Tenex to Duane Stone. They are on their way by air mail, addressed to both you and Ed Kennedy, so that in case you are still on vacation Ed might be able to handle them. The document is a recent update by Dean Meyer which I've had printed. 1u1

1-AUG-74 1020-PDT MARTINEZ: NO IDENT ASSOCIATED W/ RADC LOG IN DIRS
Distribution: PETERS AT NIC, kennedy, martinez
Received at: 1-AUG-74 10:20:07 1v

JEFF I BELIEVE YOU HAVE THE CAPABILITY (GEDIT) TO SET UP THE NEEDED IDENTS FOR USER DECONDE (ACD) AND BARNUM (ARB). CURRENTLY
NEITHER CAN ACCESS NLS : THE ERROR MSG IN THE SUBJECT FIELD OF THIS LETTER RETURS FROM TRYING TO GET NLS.
CAN U FIX?

THANX
BOBM
TYM/OFFICE-1 1v1

(jul) 2

07/30/74 1954-edt Karger,SDruid at MIT-Multics: Net mail from site MIT-MULTICS
Distribution: KENNEDY
Received at: 30-JUL-74 16:54:19 2a

I received your test message - it appears that two-way communications
are now possible! 2a1

Lt. Karger

copy to Kennedy -at

office-1

Panara -at

office-1 2a2

07/30/74 2004-edt Be'al,Druid at MIT-Multics: Net mail from site MIT-MULTICS
Distribution: KENNEDY
Received at: 30-JUL-74 17:03:52 2b

Please pass the following message on to Bill Rzepka ASAP. 2b1

you can now login to ADruid on Elefante, Kalynycz, and Walker. Pls copy files from Druid as convenient and delete in Druid. For lack of something better (because I'm in a hurry), the accoutns
currently have a $250/month limit, but we can fix that later. 2b2

Paul Karger 2b3

29-JUL-74 1415-PDT KENNEDY: Call from Spencer Floyd
Distribution: STONE, kennedy
Received at: 29-JUL-74 14:15:18 2c

Info in case the piece of paper blows away.
Spencer Floyd SRI-ARC
415-326-6200 X2483 2c1

29-JUL-74 1354-PDT OPER: ARCH REQ.
Distribution: KENNEDY, OPER
Received at: 29-JUL-74 13:54:30 2d

AT LAST THE FILE YOU REQUESTED <IJOURNAL>16650,NLS;1 IS BACK ON

LINE; THE REGRETABLE DELAY WAS DUE TO THE FACT THAT THE FILE HAD
TO BE RECOVERED ACROSS THE NET FROM TAPE STORAGE AT SRI-ARC; THIS WAS
DELAYED BY CERTAIN PERSONELL CHANGES, TURNAROUND WILL BE MUCH BETTER IN THE FUTURE,
THANX
BOBM
TYM/OFFICE-1 2d1

29-JUL-74 0530-PDT MCNAMARA: Mel Draper
Distribution: NORTON AT SRI-ARC, kennedy, stone
Received at: 29-JUL-74 05:30:19 2e

Sure glad to here you got in contact with Mel.I have been up to you know what but have been wondering where he went to.I agree it is sure is a neat kind of problem and wish we were in the postition to be more involved but thats what makes the world go round,keep us posted if you can ,we certainly are willing to help where we can and are personally interested. 2e1

23-JUL-74 1501-PDT MCNAMARA: directive
Distribution: CARRIER, Kennedy
Received at: 23-JUL-74 15:01:54 2f

disregard previous msg. It don't work the way it should 2f1

23-JUL-74 1448-PDT MCNAMARA: Output directive
Distribution: KENNEDY, carrier
Received at: 23-JUL-74 14:48:46 2g

If you want a line between levels you can do it with the following:

We hope ..... ejk & dls 2g1

23-JUL-74 1323-PDT KENNEDY: Sharon and <mcnamara>program
Distribution: KENNEDY
Received at: 23-JUL-74 13:23:01 2h

Sharon set up the subject file. It contains the fifth iteration of the program gyrations for this year. The protection code is 770000, which means that only Mac can rread it or write in it. As for the rest of the world, including us, it does not exist.

Sharon now knows how t use the calculator, on the IMLLAC, to add up the numbers, and she knows how to use the replace number command to make any changes. I also showed her how to copy a statement and edit it using the replace number command to avoid the problems of lining up the numbers.
The next bunch of changes will come from Mac to you, and the will be the sixth iteration of the program. When sharon completes it she should outpur file and rename it ITER6 at the same time, etc etc until we get to ITER100000123 or something like that.
After this she can make a print file out of the ITER6 file print it out and delete the printfile and the ITER6 file saving the CURRENT version of the program in <mcnamara>program.
(AFTER printing out 3 or more copies. One for PSO, one for me and one for Mac)
The PSO copy should be put into a permanent file somewhere for FJT. HE is the one who wants them. Perhaps we can see how much effort goes into the trivial task of putting together a program when it is documented. 2hi

15-JUL-74 1035-PDT MCNAMARA: Mel Draper
Distribution: NORTON AT SRI-ARC, stone, Kennedy
Received at: 15-JUL-74 10:35:31 2i

I have been having trouble getting a message out to you.I will try once more and if not I will have to resort to the phone.His number is 714-382-2814 Norton 8yes that is truw) AFB AFAA/DO.I don,t think there is a big rush though he was interested in getting going .He was supposed to call me as to how he made out on getting access to the TIP but as yet now word.It does sound like a neat application but at this point I have advised him that we would only advise him a little as we are tied up in e programming support world. 2ii

10-JUL-74 1421-PDT STONE: NLS/SCHOLAR
Distribution: GRIGNETTI AT BBN, Kennedy
Received at: 10-JUL-74 14:21:30 2j

The demonstration stirred up a lot of interest here. You were fortunate in getting the attention of the chief decision makers at one setting. My apologies for the delay, but one of those last minute meetings. I have drafted a letter of intent for out Div. Chief's signiture. Presuming he signs it I will transmit a copy to you via sndmsg. We should talk further about getting you a slot on Office-1, so that the Statement of

work, etc can be jointly created. Would also like to have permission to use NLS/SCHOLAR to gain familiarity with it and for occasional demos. We would of course notify you first before using it.
Hope we can continue to do business. You and your team are to be commended for the excellent job.
Stoney 2j1

9-JUL-74 1920-PDT FEEDBACK: maine?
Distribution: KENNEDY
Received at: 9-JUL-74 19:20:45 2k

maine?
What's happenen up there?esc 2k1

9-JUL-74 0959-pDT MCNAMARA: Mel Draper,s use of office-1
Distribution: NORTON AT SRI-ARC, stone, kennedy
Received at: 9-JUL-74 09:59:28 21

Lets see first i did stress that for one to be serious about the use of NLS slots would be required he assures me that if he can become a advocate that s for slots will follow,Good news on the training,I think it will consist of training two people ,His address is AFAA/DO,Norton AFB ,714-382-2814,He has a real neat need they use a informatio retrieval system now to store past auditin g reports but are bugged by the fact that is only useful for archival purposes but when the report is being pre red typically by a number of people scattered around the country side they have little or no tools and no way but the mail to cooridinate their investigation with the boss back at Norton -man you must go there ,not every one has a base in their name,It is very much a tex prepartion job which up untill a month a go we would jump at now all we are doing is agreeing to help him a little,He was supposed to call me this week but as yet no word ,I did advise him that the tip access would have to res
ved if any thing was to happen,I may call him if i do not here by thursday or so ,See you the 22nd I hope and we can chat some more if nothing pops between now and then. 211

9-JUL-74 0812-PDT KENNEDY: Address
Distribution: BAIR AT SRI-ARC, kennedy
Received at: 9-JUL-74 08:12:35 2m

John Christian
476 Court St,
Auburn, Maine 04210 2m1

Yes I did send you the address - just a few seconds ago,
Surely you didn't think I knew my daughter's address, did you?
Getstruc still needed, keep working!!! Alohavederci, Ed. 2m2

8-JUL-74 1845-PDT FEEDBACK: addr
Distribution: KENNEDY, bair
Received at: 8-JUL-74 18:45:47 2n

Ed, did you0ev>?you er0sud me a copy of John's address?
With regard to the program getdtruc, I'm still working toward
it, Ciao, Jim 2n1

8-JUL-74 1844-PDT FEEDBACK: Shared screen probs,
Distribution: STONE, KENNEDY, feedback
Received at: 8-JUL-74 18:44:28 2o

Hi, Noted your difficulty and will try to get hopper to look
at it, but to be honest , not much effort is being vesteed in
oldnls now, Perhaps the NSW demo will carry some wait (haha),
See you soon, Jim 2o1

8-JUL-74 1436-PDT STONE: Shared Screens
Distribution: FEEDBACK, Kennedy
Received at: 8-JUL-74 14:36:01 2p

Attempted shared with J Norton, on host 2 with the Tasker
initiaating the connection, I could see his actions, but he
got nothing from me, Looks like shared screen doesn't work in
any mode any more, Would be nice if it were working within the
next month or so, since we are contemplating a couple of demos
related to the NSW project
Any chance of getting it fixed?? 2p1

8-JUL-74 1359-PDT STONE: Shared Screen Problems
Distribution: FEEDBACK, Kennedy
Received at: 8-JUL-74 13:59:42 2q

I tried a shared screen using the directions in the <userguide> file, I was flipped to the exec and told
ILLEGAL INSTRUCTION JSYS DBLST = 104000,,404
at CEC+20 = 51117 2q1

I was using an IMLAC...tring to link to another IMLAC with advise,
Is this fixable?? 2q2

8-JUL-74 0733-PDT CARRIER: New Directory
Distribution: KESSELMAN, RZEPKA, BERGSTROM, LAMONICA, carrier, stone
Received at: 8-JUL-74 07:33:54 2r

As of 8 July, there now exists a directory named "WWMCCS" and the password is "roc"...Bobbie 2r1

8-JUL-74 0605-PDT MCNAMARA: NLS user
Distribution: NORTON AT SRI-ARC, stone, kennedy
Received at: 8-JUL-74 06:05:46 2s

I have a guy from the Air Force Auditors office who wants to use NLS on a trail basis to dem his people on its application to their job,it appears to be a neat application though i more of the MIS vein which as you know we are tending not to push these days,He has agreed to use our slots only during the off hours our timewhich is from 2 on,He will require some training which he has indicated he is willing to pay for ,Could use a ID his name is Mel Draper ,He indicated a desire to visit you,he in the LA ar TIp at UCLA,Could you let me know if you could train and how much he will have to pay Thanks 2s1

5-JUL-74 1056-PDT BAIR at SRI-ARC: User statistics
Distribution: MARTINEZ AT OFFICE-1, KENNEDY AT OFFICE-1, bair, norton
Received at: 5-JUL-74 10:57:02 2t

Bob, RADC has requested statistics on their use of Office-1, It is not clear exactly what that includes, but in the pre-office-1 days it was the listing by user of connect and cpu utilization,
Would you put STONE and KENNEDY on the distribution for said

listing orr let me know where they can get it? Thanks, Jim Bair 2t1

2-JUL-74 1156-PDT KENNEDY: IMLAC Rep,
Distribution: STONE, kennedy
Received at: 2-JUL-74 11:56:24 2u

We were visited by John M. Kelly and the new sales type James C. Fletcher. They are reachable at 617- 449-4600. The address is IMLAC Corp. 150 a Street, New England Industrial center Needham Mass 02194,
They are going to check to see if they can get the board we need. If possible, Fletcher will bring it on his next trip. He will call us Monday 8 July to let us know.
I triedto get hold of John Hayden but he ison leave all week. 2u1

2-JUL-74 0612-PDT MCNAMARA: ID
Distribution: NORTON AT SRI-ARC, stone, kennedy
Received at: 2-JUL-74 06:12:30 2v

Hi, Jim I have a usdr out ypur way who would like to use office-1 using one of our slots after 5 our time .He is from the Air Force Auditor,s office and is trying to get a feel for NLS.He is aware that they will need training and is willing to pay you for same as I pointed out that the use of NLS is going up and ycur time must be getting limited.He has a couple of people young i belive who would require training.He needs a ID though there is no rush on it untill the other bit can be worked out
need to know if you can handle it ,I allmost forGot,he is in the LA area at Norton AFB.He also would like to visit you some time in the near futre.If you could let me know how much s you nwed for the training bit etc ,would appreciate . 2v1

(jun) 3

27-JUN-74 1024-PDT KENNEDY: note
Distribution: KENNEDY
Received at: 27-JUN-74 10:24:16 3a

type help<cr> news<cr> 3a1

27-JUN-74 0849-PDT CARRIER: TPO
Distribution: TOMAINI, MCNAMARA, BUCCIERO, PANARA, STONE, KENNEDY, CARRIER, loreto, barnum, deconde
Received at: 27-JUN-74 08:49:24 3b

The TPO Milestone Charts are due 8 July...this is to remind you with next week being a short (July 4th) week, it will sneak up on you...Bobbie 3b1

27-JUN-74 0846-PDT CARRIER: BB&N Visit
Distribution: KENNEDY, tomaini, mcnamara, panara, stone, carrier
Received at: 27-JUN-74 08:46:03 3c

Ed, the BB&N people are scheduled to come in on the 10ttth of July...Frank will be on annual leave from 8 through 12 July...in case that should make any difference...Bobbie 3c1

26-JUN-74 1039-PDT OPER: EXERCISING A TERMINAL
Distribution: KENNEDY, FEEDBACK
Received at: 26-JUN-74 10:39:04 3d

IN RESPONSE TO YOUR MAIL OF 6/26/0759 THE PROGRAM YOU ARE REFERING
TO IS CALLED <NETSYS>TTYTST.SAV AND CAN BE ACCESSED BY CALLING IT
FROM THE EXEC.
THANX
BOB MARTINEZ
TYM/OFFICE-1 3d1

26-JUN-74 0627-PDT CARRIER: IBM People
Distribution: STONE, tomaini, carrier, mcnamara, kennedy, panara
Received at: 26-JUN-74 06:27:43 3e

Stoney, Fred Lupino called me this morning (26 June) and they have their reservations already made so they will definitely be here Fridy - 28 June - 0900 hrs....there will be three of them - Fred Lupino, John Naughton, and Frank Finnegan...Bobbie 3e1

25-JUN-74 1213-PDT KENNEDY: test messages
Distribution: CARRIER, Kennedy
Received at: 25-JUN-74 12:13:15 3f

this is the second, Let me inow what you are getting, This one is in tenex ---- 3f1

21-JUN-74 0838-PDT KENNEDY: messagee 2
Distribution: MCNAMARA, kennedy
Received at: 21-JUN-74 08:38:22 3g

zz 3g1

21-JUN-74 0837-PDT KENNEDY: messag 1
Distribution: MCNAMARA, Kennedy
Received at: 21-JUN-74 08:37:40 3h

xxx 3h1

21-JUN-74 0757-PDT KENNEDY: Demonstration
Distribution: MCNAMARA, Kennedy
Received at: 21-JUN-74 07:57:56 3i

Welcome to the world of the ARPANET, This message is provided to you using the send message capability of the TENEX at OFFICE-1, The message was generated at the IMLAC where you are reading it, The info was stored at the PDP-10 in California until now, It has been available since about a few milliseconds after it was sent. 3i1

20-JUN-74 1017-PDT CARRIER: Your Message
Distribution: KENNEDY, carrier
Received at: 20-JUN-74 10:17:28 3j

Frank has your info as of yesterday afternoon. 3j1

20-JUN-74 0619-PDT CAVANO: DEX
Distribution: KENNEDY, STONE, panara
Received at: 20-JUN-74 06:19:35 3k

I'm sure Stoney and I can find the time to brief me on DEX but I doubt that his is a complete solution. For one thing, nobody has made a study of the workload that the PSO is doing. If they do alot of editing as opposded to inputting, then DEX will have little impact. Kennedy's point that ultimately the DEX work must go on-line is weel taken but it might be faster than a one to one ratio with being on-line with DEX (human type pauses would be elimanated). Of course, this would probably be the irst thing to be run on the second shift. I still favor more training for the PSO (preferably from SRI) that would concentrate in making them more efficient and effective in the time they spend on the system. In fact all of us could use some kind of refresher course in the light of greater utilization of what we have. 3k1

19-JUN-74 1233-PDT CARRIER: Items brought up in Confessions
Distribution: STONE, carrier, panara, mcnamara, kennedy
Received at: 19-JUN-74 12:33:12 31

Stoney, could you give me some info please? 1) IBM is coming to RADC 28 Jun...what does the briefing & demo concern, what people should know about it, do you need or want a conference room set up, agendas, and whatever else you might want; and 2) the bit about ARPA/Procurement Officer - I didn't quite get the jest of it, does a write-up have to be done as far as description of Procurement Problems/Software Works....could you clue me in a little...would appreciate...thanks much.....Bobbie 311

19-JUN-74 1217-PDT CARRIER: Sylvia Baby
Distribution: KENNEDY, carrier
Received at: 19-JUN-74 12:17:50 3m

Ed, this is in regards to the Sylvia Mayer visit - what kind of briefing & demo is being given, what date (when you know for sure)...could you keep me posted???...would appreciate...thanks...Bobbie 3m1

19-JUN-74 1012-PDT CARRIER: MAR/PAR
Distribution: PANARA, KENNEDY, TOMAINI, MCNAMARA, bucciero, carrier
Received at: 19-JUN-74 10:12:52 3n

You received a message by now that it's scheduled for 14 July...I take that back...it is now scheduled for 15 July 1974. 3n1

19-JUN-74 0908-PDT STONE: PSO vs Office-1
Distribution: CAVANO, kennedy, mcnamara, panara
Received at: 19-JUN-74 09:08:54 3o

I share your concern. It seems however, that a facility must be overloaded before one can justify purchasing additional service. Although we spend most of our time planning ahead (to avoid forseeable problems like these), the plans arn't taken seriously.....Just wait and see what happens when we also try to service the NSW community at RADC on top of every thing else!! Short range soloutions are to buy more slots and /or restrict useage...neither of which I suspect management is willing to
ce directly....second shift operation is an immediate possibiiity. I suspect that we will always (in the next year or so) be in a position of having less service than is demanded, because we go around selling and taking on jobs without increasing the service....All I can say is keep bitching, because it takes a lot of it before anyone listens. 3o1

19-JUN-74 0804-PDT CAVANO: Point of Concern
Distribution: KENNEDY, STONE, MCNAMARA, PANARA, CAVANO
Received at: 19-JUN-74 08:04:16 3p

In regard to confessions today and the bid for more work for the PSO to keep them busy, I have the following comment and question. By my calculation we have right now 5 members in the PSO and coincidently 5 assured slots in Office-1, It seems to me that if we keep the PSO busy, then we will have also tied up our Office-1 utility. Is THIS WHAT WE REALLY WANT??? 3p1

19-JUN-74 0740-PDT CARRIER: MAR/PAR Briefing
Distribution: TOMAINI, PANARA, KENNEDY, MCNAMARA, carrier, bucciero
Received at: 19-JUN-74 07:40:55 3q

The MAR/PAR Briefing has been postponed to 14 July 1974 per Capt Becker/DO...Bobbie 3q1

19-JUN-74 0740-PDT CARRIER: MAR/PAR Briefing
Distribution: TOMAINI, PANARA, KENNEDY, MCNAMARA, carrier, bucciero
Received at: 19-JUN-74 07:40:55 3r

The MAR/PAR Briefing has been postponed to 14 July 1974 per Capt Becker/DO...Bobbie 3r1

12-JUN-74 1417-PDT OPER: ARCH REQ,
Distribution: KENNEDY
Received at: 12-JUN-74 14:17:56 3s

THE FILE YOU REQUESTED PROGRAMS HAS BEEN RECOVERED AND IS BACK ON-LINE
NOW,
THANX
BOBM
TYM/OFFICE-1 3s1

12-JUN-74 1322-PDT RADC-DOR at USC-ISI: EXTENSION OF SRI EFFORT
Distribution: STONE AT OFFICE-1, KENNEDY AT OFFICE-1
Received at: 12-JUN-74 13:21:15 3t

I RECEIVED THE FOLLOWING MESSAGE TODAY, I THINK THAT THE "NORMAL" 120
DAYS IS PROBABLY APPROPRIATE, DO YOU KNOW OF ANY REASON THAT IT SHOULD
NOT BE? PLEASE ADVISE,
12-JUN-74 08:40:32,767
Date: 12 JUN 1974 0840-PDT
From: EDWARDS
Subject: FOLLOW-ON TO AO 967 WITH SRI
To: RADC-DOR
cc: EDWARDS 3t1

JACK,
I AM IN PROCESS OF PREPARING A NEW AO (2842) TO GET A NEW CONTRACT
WITH SRI FOR A 12 MONTH 'CONTINUATION' OF THE NETWORK INFO CENTER
(NIC),YOU WILL RECALL THAT THIS HAS BEEN ONE TASK UNDER THE SUBJECT
AO 967,

WHAT I NEED, FOR PURPOSE OF FIGURING WHAT PART OF THE 12 MONTHS FUNDING
TO INCLUDE, IS YOUR BEST GUESS ON WHEN THE CONTRACT MIGHT BE INITIATED.
WE WILL NOT BE AUTHORIZING PRE-CONTRACT COSTS OR REQUESTING ANY SPECIAL
TREATMENT AND WE RECOGNIZE THIS WILL CAUSE A GAP BETWEEN OLD CONTRACT
AND THE NEW ONE.
ASSUMING YOU GET THE SIGNED AO BY 1 JULY WHAT IS A REASONABLE DATE FOR
PROCUREMENT TO COME TO FRUITION??
FRED.

HEY ED-IT LOOKS LIKE IT'S WORKING--LET ME KNOW--JACK. 3t2

11-JUN-74 0705-PDT CARRIER: RADC-77's
Distribution: KENNEDY, McNamara, Iuorno, Stone, Cavano, LaForge, Panara, Liuzzi,, LaMonica, Wingfield, Daughtry, Bergstrom, Rzepka
Received at: 11-JUN-74 07:05:19 3u

As of June 1974 all RADC-77's must be initialed by Lou Cassetta/ISF prior to submission to ISM. Revised RADC-77's dated May 1974 must also be used. This is for your information! 3u1

11-JUN-74 0513-PDT CARRIER: PSO
Distribution: KENNEDY
Received at: 11-JUN-74 05:13:25 3v

Just to let you know that I received your message...good idea and will do...Bobbie 3v1

10-JUN-74 1502-PDT KENNEDY: tpo
Distribution: KENNEDY, laforge, mcnamara
Received at: 10-JUN-74 15:02:28 3w

info for ELF, I have asked for the following file to be retrieved.
(LJOURNAL, 17860, 1:w)
(KJOURNAL, 17785, 1:w)
(MJOURNAL, 18355, 1:w)

These are the ones that will be needed for the TPO redo. What is the schedule and where are the instructions?? 3w1

10-JUN-74 0703-PDT CARRIER: PSO
Distribution: KENNEDY, tomaini, bucciero, carrier, panara, stone, cavano, mcnamara,, iuorno, rzepka, liuzzi, bergstrom, wingfield, daughtry
Received at: 10-JUN-74 07:03:38 3x

As of 10 June 1974, I will no longer be proof reading anything that goes out of the PSO office. Two reasons for this action: 1) I get too bogged down just reading all the documents (I really want to say crap) and 2) try to get the girls accept the responsibility for the jobs they are doing...you will still be giving me the work to be done but from then on, whoever I assign the job to, will be interacting with you. If there should be any problems, please let me know...OK... Bobbie 3x1

6-JUN-74 1040-PDT CARRIER: Jovial Document
Distribution: KENNEDY, stone, tomaini, bucciero, carrier, mcnamara, panara
Received at: 6-JUN-74 10:40:15 3y

For your info - I am done editing the JOVIAL document and it is now back in Stoney's hands. There are some tables left in the document that I think both Stoney and I have tried to ignore so my next step is to try to see what can be done with them...Bobbie...I will give the word to Landes and Nelson as far as the editing job is concerned... 3y1

4-JUN-74 0633-PDT DAUGHTRY: IDS re-compilations under S/R 8 and QUTD utility
Distribution: KENNEDY, daughtry, panara, cavano, iuorno, tomaini, mcnamara
Received at: 4-JUN-74 06:33:15 3z

ISIM (Capt. Daughtry) 3z1

IDS re-compilations under S/R 8 and QUTD utility 3z2

ISIM ISI in-turn 3z3

1. An attempt has been made during the period 13 May to 4 June to re-compile the programs necessary to load the ISI Integrated Data Store data base with calls to the PRC data base management system monitors. No apparent problem was encountered in incorporating the monitor calls; however, none of the compiled IDS programs operate sucessfully in a GELOAD activity (execution). Each program tend to end under abnormal conditions leaving the allocated data base files in ABORT LOCK status. It should be pointed out that object decks created under S/R 6 using the same identical source decks continue to execute properly even under S/R 8. The problem with execution of object decks created under S/R 8 cannot be resolved by me at this point in time. 3z4

2. Another apparent problem with maintaining the data base integrity is the unavailability of the IDS data base dump utility (QUTD). This routine is normally used to dump all the ISI data base files to one tape for use as a recovery medium (backup) when files are in abort lock status. The Honeywell software people are presently working on the problem and are expected to have a fix on the problem soon; however, the Phoenix patch does not resolve completely the problem of not being able to dump ALL IDS files to one tape. In other words, even with the present correction being made, it will be necessary to dump each relatively small file to its own tape (five tapes) to satisfy the QUTD utility limitations. Under S/R 6 we were able to dump all five files to one tape. At the present time our backup tape dates back to March 1974. I should point out that we can resort to restoring lost files via the facility save tapes. In that case Bob Doane will be asked to run special file system jobs to reload the files which is expected to be a tedious process. 3z5

David L. Daughtry 3z6

Change in Statement Name Delimiter Defaults in Preview

As we continue to bring up the most recent version of Preview the latest design features are incorporated. These may result in changes to Preview that affect the way you work. Our present state of flux makes it difficult to announce every change, but as we come closer to releasing NLS-8 for general use, announcements and documentation should minimize any surprise.
A recent change concerns statement names. Statement names are now delimited by nothing (null), i.e. you do not need to use parentheses. This means that every string of valid name characters at the beginning of a statement will be its name. The name will end at the first invalid name character, e.g. a space. This will take effect in new files generated by the command: Create File. If you prefer to continue the use of parentheses, you may set a useroption so that your default will be parentheses, or whatever valid delimiters you choose. You also may set delimiters for any structural entity, eg. branch 0 of a file (which then controls all statements in that file). 1

"Null" name delimiters were decided upon as an experiment and we welcome feedback. The fact that you can permanently change them by Goto (subsystem) Useroptions, Name (delimiters defaults to):, should fit each persons needs. Comments welcome (sndmsg to FEEDBACK). 1a

RJC 8-OCT-74 06:07 31130

Statement of Work - J. Kennedy

<CARRIER>ISCSOW,NLS;2, 26-SEP-74 06:14 RJC ;

RJC 8-OCT-74 06:07 31130

Statement of Work - J. Kennedy

ROME AIR DEVELOPMENT CENTER
GRIFFISS AIR FORCE BASE
NEW YORK

STATEMENT OF WORK

FOR

INTERACTIVE GRAPHICS TERMINAL

PR-I-54764

DATED: 27 SEPTEMBER 1974

Statement of Work - J. Kennedy

1.0 Objective: The objective of this work is to acquire a basic hardware configuration that will provide an interactive graphics display capability that will be used as a Research and Development tool in support of mapping, charting and geodetic applications within the Defense Mapping Agency Aerospace Center (DMAAC). This basic system will automate the process of editing large data bases of graphical information residing on a Univac 1108 system. The graphics display system must have good expansion potential to increase capabilities in the areas of total system storage and interactive input devices.

2.0 Background: The automation problem to be solved is primarily concerned with interactively editing existing digitized charts, maps and geodetic information. This information resides in large scale data bases within a Univac 1108 computer system. It is desired that the user shall be able to select and extract data base segments to be displayed on a refreshed CRT device. The displayed information will then be interactively edited and returned to the original data base. An important consideration is that the proposed system should not significantly increase the present workload of the Univac 1108. Therefore, the editing process will be performed off-line of the 1108 and the display system will either contain or be controlled by a mini-computer. The graphics systems must be capable of displaying the following types of information: Alphanumerics in a textual mode, random vectors, and vectors with random alphanumeric annotation. Specific interactive input devices will include a keyboard, function switches, and a light pen. The desired system is shown in Figure 1.

3.0 Areas of Consideration: Not applicable.

4.0 Tasks/Technical Requirements: The following items covered in this section are mandatory requirements. Alternate items will be considered only if the vendor clearly offers more cost effective items that meet or exceed the following minimum performance standards.

4.1 Mini-Computer: The following is a list of mandatory characteristics of the mini-computer.

4.1.1: Hardware:

4.1.1.1 Word Length: The minimum word length will be 16 bits.

4.1.1.2 Memory Cycle Time: The memory cycle time shall be one microsecond or less.

4.1.1.3 Memory Size: The minimum memory size shall be at least 16K words of 16 bit mainframe memory field expandable to 32K words.

4.1.2 Software: The vendor will supply its standard utility and support package. A FORTRAN IV compiler will be included.

4.1.3 Input Devices: The following input devices with interfacing and software device handlers will be supplied by the vendor.

4.1.3.1 Keyboard: An alphanumeric keyboard will be supplied. The output will be ASCII encoded. The keyboard shall be capable of generating all 128 ASCII characters.

4.1.3.2 Function Keys: There shall be a minimum of six programmable function keys or switches supplied. These switches may, at the vendor's option, be included as an integral part of the keyboard or as a separate unit.

4.1.3.3 Light Pen: One light pen with appropriate interface and cabling will be supplied. The light pen hardware or software must provide the current X, Y beam position information, and the position in the display list of the item causing the hit.

4.1.3.4 Paper Tape Reader: One high speed paper tape reader with interface will be supplied. The reader shall meet the following specifications: Reading rate of at least 300 characters per second, accepts one inch wide eight channel, ten characters per inch paper tape produced on an IBM Model 1012 Paper Tape Punch or equivalent.

4.1.4 Hardcopy Unit: A graphic hardcopy device shall be included. The device shall be slaved to the primary system CRT. Initiating of the copying process shall be program or operator controlled. The software device handler shall be included.

4.1.5 Interfacing: The vendor shall meet the following interfacing requirements. The vendor will interface to the host

Univac 1108 through the communication Terminal Module Controller (CTMC) via a communication Terminal Module (CTM). User will supply a CTM-VI Model F0991-00. This CTM is RS232C compatible. The primary constraint is 9600 baud half duplex minimum data rate. The vendor will supply all the hardware, including cabling, necessary to effect the interface.

4.2 Display Processor: The display processor shall provide the following display capabilities.

4.2.1 The viewable display resolution shall be no less than 1024 x 1024 points.

4.2.2 The addressable image space shall be no less than 2048 x 2048 points.

4.2.3 The display processor shall scissor or clip any portion of an image that falls outside the defined viewing area of the display CRT. This capability shall be a function of the hardware.

4.2.4 The display processor shall provide a hardware capability to translate an image in both the X and Y directions with scissoring or clipping of the image outside the normal viewing area.

4.2.5 The display processor shall have the hardware capability to scale images by the following factors: 1/4X, 1/2X, 1X, 2X, 4X.

4.2.6 The display processor shall have the hardware capability of generating arcs/circles of specified center and radius.

4.2.7 The hardware vector generator must be capable of generating at least 2000 inches of vectors without flicker. Endpoint closure shall be within one display element. The vector generator shall be capable of generating both absolute and relative vectors.

4.2.8 The processor shall have the capability to display the standard 96 character ASCII set.

4.2.8.1 The processor shall be capable of display at least one page of text, consisting of at least 35 lines with at least 72 characters per line. A full page of text shall be displayed without flicker.

4.2.8.2 The character size shall be not less than 0.12 inches high and not less than 0.10 inches wide.

4.2.8.3 The character generator shall be operable in a text mode, generating its own spacing constants, and in a random mode for annotation of graphs and other images.

4.3 The CRT display monitor shall meet the following minimum requirements.

4.3.1 The minimum height and/or width of the viewing area shall be 13 inches. The longer dimension of the usable viewing area, if any, shall be oriented horizontally. The aspect ratio shall not be less than 3:4.

4.3.2 The CRT spot diameter shall be less than 0.15 inches (15 mils), as measured at the half-luminance points, at any point within the usable viewing area.

4.3.3 The display CRT shall be direct view with the image refreshed by the mini-computer. The refresh rate shall be no less than 30 frames per second.

4.3.4 The line luminance brightness shall be no less than 40 foot lamberts.

4.3.5 The full screen width repositioning time, settling to within one display element of the final addressed position, shall be less than 25 microseconds.

4.4 Vendor Support Requirements:

4.4.1 The vendor shall supply the following documentation. Identified documents may, as offered by the vendor, be bundled.

4.4.1.1 The vendor shall furnish three copies of operating manuals describing the functional use of the proposed equipment.

4.4.1.2 The vendor shall furnish five copies of programmer manuals describing programmer techniques consistent with the installed system configuration.

4.4.1.3 The vendor will furnish three copies of documentation

(source and/or assembly listings) describing all delivered software.

4.4.1.4 The vendor must supply a comprehensive maintenance package (hardware and/or software) to test, detect, and isolate malfunctions in all equipment delivered. This package shall include three copies of maintenance manuals.

4.4.2 Maintenance Certification: The vendor must certify that all engineering changes, that have been announced by the Original Equipment Manufacturer (OEM), have been installed on all delivered items at the time of installation and that the equipment is certified as eligible for a maintenance contract with OEM.

4.4.3 Proposals shall specify the types of maintenance services normally made available. The bidder/offerer shall include the following information: Frequency and duration of normal preventive maintenance and their designated point of contact for servicing equipment malfunctions. Maintenance shall be priced separately.

4.4.4 The winning vendor shall include all inter- and intra-cabling necessary for complete system operation.

4.4.5 Training: The selected vendor must provide maintenance and programmer/operator training. Vendors will supply comprehensive course curricula and a time schedule citing when courses are offered. Separate prices are requested for courses offered at the vendor's facility and also for courses to be offered at DMAAC, St. Louis, Missouri.

4.4.6 Acceptance testing will be performed in accordance with the requirements listed in this document. Preliminary testing shall be conducted at the contractor's facility by contractor personnel and witnessed by the contracting officer or his duly authorized representative. The winning vendor will submit a final test plan to the contracting officer at least 30 days in advance of the final test date. Final acceptance testing shall be conducted at the place of installation by the contractor and witnessed by the contracting officer or his duly authorized representative.

4.4.6.1 The preliminary testing will be waived at the contracting

officer's discretion if all the equipment to be installed consists of off-the-shelf items.

4.4.6.2 Final testing will include thorough mechanical, electrical, and visual inspection and test to determine that the quality of all materials and workmanship is in compliance with the requirements of this document. Particular attention shall be given to the following:

4.4.6.2.1 Completeness.

4.4.6.2.2 Nameplates, identification markings and labels.

4.4.6.2.3 Finishes.

4.4.6.2.4 The fit of components in their respective positions.

4.4.6.2.5 Check of safety features and interlocks.

4.4.6.2.6 Loose fastening and securing devices or parts.

4.4.6.2.7 Condensation.

4.4.6.2.8 Accessibility of components and parts for servicing.

4.4.6.2.9 Cable runs between components including plugs and receptacles.

4.4.5.2.10 Grounding connections.

4.4.6.2.11 Other visual defects.

4.4.7 The physical configuration of the system shall be based on the use of a desk-like console. Vendors will describe and/or picture their mechanical/physical layout.

4.4.8 The equipment shall be capable of operating under the following environmental constraints:

4.4.8.1 The available site is approximately 7 feet by 12 feet with a 9-foot ceiling height. The floor is concrete overlaid with asbestos/vinyl tile and has a loading capacity of 250 lbs per square foot. Access door dimensions are 5 x 7 feet. An

appropriate overhead cable through/conduit will be installed by DMAAC.

4.4.8.2 The available site distance is less than 200 feet from the host Univac 1108.

4.4.8.3 Available Facilities:

4.4.8.3.1 Available power is 115VAC(+10%) 60HZ and 230VAC (+ 10%) 60HZ both at 30 amps.

4.4.8.3.2 Air conditioning such that the temperature is 65 + 5 and the relative humidity is 55% + 5%.

RJC 8-OCT-74 06:10 31131

PR Information

Roger, I don't know what this is but it hasn't been worked on since 11 September so I thought I better journal it...Bobbie

PR Information

<CARRIER>PSPL,NLS;1, 11-SEP-74 10:09 RJC ; 1

Math Tech for Anal & Design (Mich U) B-5-3212		O1R	$153,593	1a
Large Scale Info Sys	O1R	$150,000	B-5-3213	1b
Information Retrieval Res Sup	O1R	$ 20,000	B-5-3214	1c
Automated Verification Sys	O1R	$ 82,816	B-5-3215	1d
Software Reliability Study	O1R	$ 33,197	B-5-3216	1e
NLS Service	O1R	$105,000	B-5-3217	1f
DM-1 Reliability	O1R	$ 25,000	B-5-3218	1g
Computer Security Tech Sty	O1R	$ 23,2000	B-5-3219	1h
Exp Interim RADC MIS	O1R	$ 24,800	B-5-3220	1i
Ext of Harvard ECL Prog Sys	O1R	$ 50,000	B-5-3221	1j
GCOS Investigations	O1R	$ 55,000	B-5-3222	1k
GCOS Simscript Model	O1R	$ 80,000	B-5-3223	1l
Rugged Prog Envr (RPE)	O1R	$ 72,000	B-5-3224	1m
Soft Modeling Studies	O1R	$136,000	B-5-3225	1n
Compiler Optimization Sty	O1R	$ 32,262	B-5-3226	1o
Imp JOCIT J3	O1R	$ 15,000	B-5-3227	1p
Mag Card Comm Term	O1R	$ 7,100	B-5-3228	1q
				1r
TOTAL O1R'S		1,064,968		1s
				1t
BRANCH OPERATING COSTS				1u
FY-75 TDY Funds Project 5581		$ 33,000	B-5-3229	1v
FY-75 TR Funds Project 5581		$ 4,800	B-5-3230	1w
Supplies & Equipment	$ 5,000	B-5-3231		1x

1y

TOTAL $ 42,800 1z

1a@

R&D Facility - Hardware Maint - Proj 5581 O1R $35,000
B-5-3400 1aa

Communications O1R $70,000 B-5-3401 1ab

Model 300 Rental O1R $19,000 B---5-3402 1ac

H635/645 Computer Rental O1R 1,343,000 B-5-3403 1ad

Supplies & Equipment O1R $40,000 B-5-3404 1ae

Auerbach Manuals O1R $ 2,850 B-5-3405 1af

1ag

TOTAL O1R 1,509,850 1ah

1ai

JOVIAL/J73 Revision $40,000 B-5-3201 1aj

Tools for Good structure $75,000 B-5-3202 1ak

Ident Verific For Sec Controls $45,000 B-5-3205 1al

Secure 6000 Environment $50,000 B-5-3204 1am

Large File Modeling $30,000 B-5-3203 1an

High Qual Documen term Sys $45,000 B-5-3211 1ao

JOVIAL Interface to NLS $36,000 B-5-3210 1ap

Mini Comp Front End for NLS $115,000 B-5-3209 1aq

Forms Generation System $25,000 B-5-3208 1ar

ARPA NET Comm & Maint $30,000 B-5-3207 1as

TIP 4K Core Module $ 3,363 B-5-3207 1at

Information Retrieval Res Sup $25,000 B-5-3233 1au

PR Information

lav

TOTAL	$276,000	law

RJC 8-OCT-74 06:17 31132

Tickler - Month of September 1974

(sm1) 2 September - Monday 1

News Brief items due into Becky Today,(KJOURNAL, 19533, 1:W) 1a

Bobbie: Personnel Strength Rpt, due. 1b

(st1) 3 September - Tuesday 2

1300 hrs, Branch Chiefs Meeting 2a

(sw1) 4 September - Wednesday 3

ISC Confessions 0830 hrs. 3a

(sth1) 5 September - Thursday 4

0830 hrs, Branch Chiefs Meeting 4a

Laboratory Activity Reports due today: Bucciero must have them by 1000, ISM must have them by 1100, and DOT must have them by 1600,(KJOURNAL, 19513,1:W) 4b

(sf1) 6 September - Friday 5

(sm2) 9 September - Monday 6

(st2) 10 September - Tuesday 7

1300 hrs, Branch Chiefs Meeting 7a

(sw2) 11 September - Wednesday 8

ISF Confessions 0830 hrs. 8a

(sth2) 12 September - Thursday 9

0830 hrs, Branch Chiefs Meeting 9a

Laboratory Activity Reports due today: Bucciero must have them by 1000, ISM must have them by 1100, and DOT must have them by 1600,(KJOURNAL, 19513,1:W) 9b

(sf2) 13 September - Friday. 10

Timecards due today 10a

(sm3) 16 September - Monday 11

R & T Selection of the Month is due in ISI, (KJOURNAL, 19531, 1:W) 11a

Tickler - Month of September 1974

(st3) 17 September - Tuesday 12

0830 - Col Manley(AFSC/XRF) - Conference Room 12a

Col Krutz - TDY 12b

1500 hrs, Branch Chiefs Meeting 12c

(sw3) 18 September - Wednesday 13

Col Krutz - TDY 13a

(sth3) 19 September - Thursday 14

0830 hrs, Branch Chiefs Meeting 14a

Laboratory Activity Reports due today! Bucciero must have them by 1000, ISM must have them by 1100, and DOT must have them by 1600.(KJOURNAL, 19513,1!w) 14b

(sf3) 20 September - Friday 15

(sm4) 23 September - Monday 16

0830 - MIS briefing/CC, C102 (1 hour) 16a

Commander's Supervisory Call - 1400 hrs, - Bldg, 106 - Auditorium 16b

(st4) 24 September - Tuesday 17

BRIEFING ON THREADS MANAGEMENT SYSTEM - Representatives from the Computer Sciences Corp., Huntsville, Ala., will present a briefing on THREADS in Conference Room 1 on Tuesday, 24 Sept., 0900 - 1100 hrs.
THREADS is a systems management methodology aimed at establishing a better means of monitoring and controlling software production efforts. The Threads Management System (TMS), consisting of a set of computer programs which support the Threads methodology and facilitates its application to a given system environment, will also be discussed.
The briefing will be two hours and will cover the following topics:

- *Introduction
- *Practical Experience - Aegis, 485L, P3C, CVTSC, etc.
- *Availability
- *Future

For further information, please contact R. Robinson or Capt S. Ruple - X4325 or X 7546. 17a

Tickler - Month of September 1974

Collect topic write-ups for ISI confessions! 17b

Due Date - ISIM/ISIS - Forward nominations ONLY - SIMSCRIPT II.5 Course - COMPLETED 17c

Update <KENNEDY>VGRAPH for Confessions 18

(sw4) 25 September - Wednesday 19

ISI Confessions - 0830 hrs. 19a

10:00 - Branch Chief Meeting 19b

Due Date - ISIS - Technical Evaluation - PR-B-5-3201 - COMPLETED 19c

Due Date - ISIM/ISIS - submit inputs - Fifth Annual USAF Academy Computer Related Information System Symposium (CRISYS) 19d

(sth4) 26 September - Thursday 20

DL Technology Review - Dry RUn for the Commander - IS scheduled from 1400 - 1630 (Both TPO 11,12) 20a

Due Date - ISIM - Project Engineers Bimonthly Review of Tech Completions - COMPLETED 20b

0830 hrs, Branch Chiefs Meeting 20c

1600 - Officers Commander's Call 20d

Laboratory Activity Reports due today: Bucciero must have them by 1000, ISM must have them by 1100, and DOT must have them by 1600,(KJOURNAL, 19513,1:W) 20e

Submit following for R&T Selection - Final Tech Rpt "Criteria for Evaluating the Performance of Compilers" - ISIS/D, White 20f

Due Date - ISIS/ S, DiNitto AFSC Info System Newsletter - COMPLETED 20g

(sf4) 27 September - Friday 21

Timecards due today 21a

Due Date - ISI/Tom - Monthly Due-Out Validation w/atch - Supply/Equipment Listing, - COMPLETED 21b

(sm5) 30 September - Monday 22

Tickler - Month of September 1974

Form 2's (employee time expenditures) are due today. 22a

Tickler - Month of September 1974

Due Date - ISI/IFrank Tomaini Case File 74-181 - COMPLETED 22b

Due Date - ISIM/ISIS Forward nominations to ISI - Current reliability and maintainability concepts 22c

reaction to NLS-8

SYSTEM RESPONSE TIME 1

The system response time ranges from acceptable to horrid (during the period from 9 to 4 EDT at any rate) and it isnt (from where the user sits anyway) entirely clear why. I would hope that SRI takes some action to both clairfy and alleviate the situation. Surely, there is some economical configuration that will support 23 users (a goodly percentage of them running the same program at any time) gracefully. As response time deteriorates, the usefulness of NLS is degraded. While the experienced user may be merely annoyed, the novice becomes confused and frustrated as the recognition schemes, prompts, and the HELP mechanism only serve to hinder instead of help. At some point, response is so degraded that the system become unusable. Clearly, such a situation benefits no one. 1a

PROMPTS 2

The prompts are fine especially since they can be turned off. Let me put in a plug here for the USEROPTIONS subsystem-it seems to work quite well and comes in handy (e.g., should work well in constructing half-duplex interface or an interface thats closer to old NLS etc.). 2a

COMMANDS 3

The commands seem reasonable enough. I have no particular complaints about them. The important thing is that people can learn them and use them (by invoking help,the ? , the prompts , and occasionally the telephone) with not too much effort. 3a

FEEDBACK 4

No complaints. Feedback has been good. In some ways, of course, it's still a learning process and needs time to settle down. 4a

SUBSYSTEMS 5

Unfortunately, the HELP system is still prone to bugs and it may (repeat may) prove a bit difficult to use. However, when it settles down, I think it should be quite valuable. 5a

I would like to see the calculator subsystem made available again as I have had several questions about such a capability. 5b

Both SENDMAIL and USEROPTIONS seem to perform adequately, no complaints about either of them. 5c

reaction to NLS-8

I heartily endorse Duanes Comment about the Identification subsystem, It should be maintained by the architects . 5d

USER PROGRAMS 6

The only user programs we have used are a subset of Duanes list, I agree that they should be quickly made available under NLS-8.x and would like to see Duanes priorities. 6a

SYSTEM BUGS 7

The system bugs are apparently being taken care of quite well using the feedback mechanism. However, when the system becomes the operational system I hope that more care is taken in investigating the effect of any changes to the system, I have seen several bugs crop up that are obvious enough to be revealed by a casual exercising of the system (e.g., printing 50 or more line feeds when doing a Print Journal [and in other situations also]). The system must be more stable when it is the operational system. 7a

DOCUMENTATION 8

Some kind of transition documentation (e.g., equivalence lists, pocket command cards, primers) is needed. Otherwise, on-line documentation that is comprehensive, up-to-date, and easily available should be sufficient. 8a

SUMMARY 9

Just to sum up/clarify my reactions, I feel that the NLS system is very well put together and is very well supported by the ARC staff, In general, the bugs that we see are, I believe, either due to the "shakedown" period or are of the sort that any system is prone to from time to time, In short, they are expected. Unfortunately, the unacceptable response time impairs or destroys the usefulness of the system and some action must be taken to bring the response time into the acceptable range. 9a

misc, comments on DNLS, on nls8 conversion, on mouse

re DNLs at Bell Canada 1

1200 baud on the Hazeltine is much too slow to really appreciate DNLS; 1a

we've ordered a higher speed capability for this particular channel - up to 4800 from 1200 baud 1b

even so, I expect this will still be too slow to really make the interface invisible. 1c

further to this, the system's response time is so slow that when the screen has to refresh itself, there is a noticable delay that discourages further modifications 1d

re the conversion to the new nls - NLS8 2

I understand that only one month will be provided as a period for conversion (only one month in wich both the old and the new nls will be available 2a

With the load avg, and response times such as they are, it will be very difficult for us to really get an idea of what can be done; 2b

re our mouse 3

JCN has seen and used the mouse, and he confirms that it seems to be performing erratically. 3a

RJC 8-OCT-74 07:09 31135

PRESENTATION - DICTRAN

NOTICE - Mr. William Wolf, President of Wolf Computer Corp. will present DICTRAN - a new word processing system which enables man-machine communication using the spoken word. "In a word processing environment, the programmer would probably communicate his program at a rate of 100 words per minute or more, using a standard kind of dictation machine or other word processing system." Briefing will be held at 0930 hrs. in Bldg. 3, Conference Room 1006. For further details, contact Michael Landes, ISIS, X7546. 1

MIKE 8-OCT-74 11:44 31136

monitoring your transmission at this end wth modified CRT

resend of earlier sndmess, that didn't get through,

monitoring your transmission at this end wth modified CRT

Jim Neill, one of our hardware experts in this co,, has suggested a method of determining exactly what's being received by the centronix at this end,
He proposes taking a midified CRT of theirs and patching it into the feed from the MUX to the lineprocessor. The CRT has been modified so that it displays all the ascii char's, it is receiving, including all control char's,, nulls, etc, (Don't ask me how it does it ,)
Jim would like to know if you think this would be valuable as a diagnostic aid, If so, he will check into it further, 1

EJK 8-OCT-74 14:09 31137

Lost Mail being resent.

RJC 8-OCT-74 07:09 31135
PRESENTATION - DICTRAN
Message: NOTICE - Mr. William Wolf, President of Wolf Computer Corp. will present DICTRAN - a new word processing system which enables man-machine communication using the spoken word. "In a word processing environment, the programmer would probably communicate his program at a rate of 100 words per minute or more, using a standard kind of dictation machine or other word processing system." Briefing will be held at 0930 hrs. in Bldg. 3, Conference Room 1006. For further details, contact Michael Landes, ISIS, X7546.

1

JHB 8-OCT-74 15:10 31138

Increase in the Size of Memory at Office-1

To Architects for your distribution to respective organizations.

Increase in the Size of Memory at Office-1

TITLE: Increase in the Size of Memory at Office-1
COMMENT: To Architects for your distribution to respective organizations.
AUTHOR(S):JHB
NUMBER:31138

DISTRIBUTE FOR ACTION TO: KWAC
DISTRIBUTE FOR INFO-ONLY TO: RLL ,hopper
SUBCOLLECTION(S):
MESSAGE: There will be an addition of 64K of memory to the Office-1 PDP-10 with an expected operational date of 14 Oct 74. This will increase the capacity of the present system. We hope that the system response to users will be faster than is currently being experienced.
BRANCH AT:
PLEX AT:
GROUP AT:
FILE:
SEND THE MAIL.

JHB 8-OCT-74 15:10 31138

Increase in the Size of Memory at Office-1

(J31138) 8-OCT-74 15:10;;;; Title: Author(s): James H. Bair/JHB;
Distribution: /KWAC([ACTION]) RLL([INFO-ONLY]) ;
Sub-Collections: SRI-ARC KWAC; Clerk: FEED;

viewspec y

viewspec little-y doesn't give me any blank lines. This preview 8 Oct, 3:15 pm. 1

call me

call me

FEED 8-OCT-74 20:32 31141

Response to Comments on New NLS by EJK, Re: 31121

Dear Edmund,

Thanks for your numerous comments on NLS8 and associated problems. All of the bugs you reported have either been fixed or are in preocess of being fixed.

The system speed should be better when we bring up an additional 64 K of memory on 14 Oct. Of course this will not help the Net problems, and any leverage exerted in that area would be helpful.

Training/retraining of users at RADC in NLS8 is of concern to us as I'm sure Jim Norton has pointed out. I'm prepared to help as I can during a visit which is presently scheduled for the 17th and 18th of Oct. I have been trying to reach you be phone and so far have been unsuccessful, but will keep trying.

NLS8 is in its most experimental, and unstable stage now, but with everyone's contribution (really!) we can have a reliable system by Nov. and hopefully have everyone tranferred by Dec. The addition of documentation should help considerably.

Regards, Jim

1

RJC 9-OCT-74 06:17 31142

DICTRAN

In regards to the DICTRAN Notice I sent previously, the date for the demo is 10 October,,,Bobbie 1

RJC 9-OCT-74 06:30 31143

AF 1152s

Due Date - ISIM/ISIS - Request AF Forms 1152s for USC Term III, 28 Oct through 20 Dec 74, courses be submitted to this office by 15 Oct 74. Courses to be offered are:

SSM 531 - Man-Machine Factors in Systems Management

SSM 510 - Aerospace Management Communication Theory

The NEW Tuition Rate is $291.00. 1

ISI Job Order Register

(J31144) 9-OCT-74 12:09; Title: Author(s): Roberta J. Carrier/RJC;
Distribution: /DRL2 RJC; Sub-Collections: NIC; Clerk: RJC;
Origin: <CARRIER>JOBREGISTER.NLS;1, 25-SEP-74 09:06 RJC ;

ISI - JOB ORDER REGISTER 1

JOB ORDER NUMBER	TITLE	PROGRAM ELEMENT	PROJECT ENGINEER	2
IDHS0901	Eucom Aides IDH Improvement	31025F	D. Gondek	3
R1760001	WWMCCS Testing	62702F	R. Liuzzi	4
06DMOIRD	IR&D Site Survey	62702F	J. Wheeler	5
06DMOPAT	Patent Review	62702F	R. Cain	6
06DMOUPS	Unsol Prop Eval	62702F	R. Cain	7
12660001	Microform System	64708F	Osinski	8
19920101	AFDSC Multics Work Plan	64704F	W. Rzepka	9
20520001	RADC Part Dig Av Info sys	63203F	McLean	10
20520202	DAIS Support	63203F	McLean	11
21080101	Tech Spt AF HIS 6000 Sites	63728F	Iuorno	12
21080301	General GCOs	63728F	Wingfield	13
21080401	Front End Process Software	63728F	LaWrence	14
21080601	Long Range R&D	63728F	Kesselman	15
21080801	WWMCCS DMS WWDMS Support	63728F	Bergstrom	16
25410101	Workshop Utility Service	62708E		17
31760001	Radiat Test Supp Opr Amp	62702F	Tomaini	18
31760004	High Eff Power Converter	62702F	Tomaini	19
31760005	Test Rad Hard Pwr Supply	62702F	Bucciero	20
31760006	Hughes Acft Test Plan	62702F	Bucciero	21
31760007	Radiation Test Program	62702F	Tomaini	22
404L0610	ABN Inst for AN/ARN-XXX	35114F	Reed	23

ISI Job Order Register

481B0000	Adv Abn Command Post	64723F	Smith	24
481B0101	AABNCP Support Travel	64723F	Smith	25
55500114	Assoc Proc Cost Study	63728F	Previte	26
55500120	Assoc Prcs Appl PD to ESD	63728F	Previte	27
55500122	Assoc Process Appl Study	63728F	Klayton	28
55500123	IBM Comm Term Mod 2741	63728F	Robinson	29
55500124	Gen Purpose Assoc Proc	63728F	Reimann	30
55500125	Fast APL for Multics	63728F	Bauer	31
55500302	Radiation Hard Mis	63728F	Panara	32
55500304	Inter Comp Simul of Mod	63728F	Panara	33
55500404	DM-1 Remote Query & Recovery	63728F	Bergstrom	34
55500408	DM-1 Training Document	63728F	Landes	35
55500411	DMS Sata Collect JTSA	63728F	Sliwa	36
55500412	DMS Evel Methodology	63728F	Wingfield	37
55500413	DMS Security (JTSA)	63728F	Sliwa	38
55500414	DMS For Rel & Anal Center	63728F	Bergstrom	39
55500415	WWMCCS Software Support	63728F	Sliwa	40
55500416	DM-1 Testing for AFDSC	63728F	Bergstrom	41
55500603	Network Info Ctr & Comp	63728F	Stone	42
55500801	PD to ESD	63728F	Robinson	43
55500802	PD to ESD	63728F	Patterson	44
55500803	Structured Programming Sys	63728F	Mark	45
55500804	SEMANOL J73	63728F	Ives	46
55500805	Compiler Optimization Sty	63728F	Ives	47
55500806	Software Modeling Studies	63728F	White	48

ISI Job Order Register

55500815	National Software Works		Wingfield	49
55500901	PD to ESD	63728F	Panara	50
55500902	Secure Data Management System	63728F	Rzepka	51
55501401	Inter Proc Disp Sys AFGWC	63728F	LaSalle	52
55501402	Airborne C&C Disp Console	63728F	McDowell	53
5581MS01	Rental of BR-700	62702F	Stone	54
55810001	Software Reliability	62702F	Nelson	55
55810002	Computer Lang & Compilers	62702F	Nelson	56
55810003	Software Valid & Document	62702F	Stone	57
55810004	Mgt Info Sys Dev & Eval	62702F	Stone	58
55810006	Data Mgt Sys (DMS)Dev	62702F	Iuorno	59
55810203	Std Lang Implement	62702F	DiNitto	60
55810204	Jovial Lang Spec Update	62702F	DiNitto	61
55810205	Jovial Imple Tool (JOCIT)	62702F	DiNitto	62
55810209	AHI Evaluation Support	62702F	Stone	63
55810210	Integration/Transact Proc	62702F	Liuzzi	64
55810211	Math Tech Anal & Des Comp	62702F	Iuorno	65
55810212	Info Retr Res Support	62702F	Giordano	66
55810213	Large Scale Info Sys	62702F	McNamara	67
55810215	DM-1 Err Anal Maint	62702F	VanAlstine	68
55810217	AHI Line Printer	62702F	Stone	69
55810218	Computer.Fac Support	62702F	Stinson	70
55810219	Auto Verification Sys	62702F	Robinson	71
55810222	GCOS/Multics File Tran Fac	62702F	Rzepka	72
55810223	Method for Anal & Comp of DMS	62702F	Wingfield	73

ISI Job Order Register

55810227	AHI Evaluation Support	62702F	Stone	74
55810228	Software Cert Rel & Timeliness	62702F	Robinson	75
55810230	Holmes Tycom 38 KSR ASCII	62702F	Stone	76
55810231	Software Reliability Study	62702F	Cellini	77
55810233	Beehive Terminals	62702F	Normand	78
55810237	Computer Security Tech Sty	62702F	Iuorno	79
55810240	GCOS Investigations	62702F	Liuzzi	80
55810241	GCOS Simscript Model	62702F	Liuzzi	81
55810242	Secure Data Management sys	62702F	Rzepka	82
55810243	Exp Interim RADC MIS	62702F	Weber	83
55810244	Large Scale Info Sys	62702F	Iuorno	84
55810902	Network Processor System	62702F	Lawrence	85
55811201	JOVIAL Ref Manual	62702F	DiNitto	86
55811202	JOVIAL Valid Sys (JCVS)	62702F	Motto	87
55811203	Statistics on JOVIAL Lang	62702F	White	88
55811204	JOVIAL Subset & Compil Spec	62702F	DiNitto	89
55811206	Compl Perform & Measure Sty	62702F	White	90
55811209	Ext Harvard ECL Prog Sys	62702F	DiNitto	91
55811210	Rugged Prog Envr (RPE)	62702F	Ives	92
55811213	JOVIAL/J73 Revision	62702F	DiNitto	93
55811401	Software Valid & Reliab	62702F	Robinson	94
55811501	Aids to Software Document	62702F	Kennedy	95
633A0001	Cobra Dane	31015F	Filer	96
99915A85	SADPR-85		Morreale	97
99910000	Management/Supervision	Indirect	Barnum	98

ISI Job Order Register

99912108	Project Formulation & Mgt		Iuorno	99
99915550	Project Formulation & Mgt		Panara	100
99915581	Project Formulation & Mgt		Tomaini	101
99920000	Administration	Indirect	Barnum	102
9993MASI	MASIS	Indirect	Thompson	103
9993OIRD	Site Survey	Indirect	Wheeler	104
9994SYMP	Symposia	Indirect	Barnum	105
9994TRNG	Training	Indirect	Barnum	106
99956MIL	Military Duties	Indirect	Tatyrek	107
99954000	Annual Leave	Indirect	Barnum	108
99955000	Sick Leave	Indirect	Barnum	109
99956000	Other Leave	Indirect	Barnum	110
99960000	Miscellaneous - Other	Indirect	Barnum	111

MAP2 9-OCT-74 20:36 31146

Get me into KWAC on time...

I would like to be included in KWAC ASAP,
...Mike Placko 1

EJK 10-OCT-74 11:53 31148

Training for RADC on New NLS

James, 1

Your message re: your 'training' plans was received and noted with some trepidation. 1a

The trepidation was prompted by an assumption by us that this was the extent of the training that you felt was needed at RADC. However, if one looks only at what you said without making unwarranted assumptions then there is no apparent cause for alarm. 1b

If I remeber what you said, the purpose of your visit is to help bring us up on the New NLS. Very laudable and certainly needed. I think that planning to spend three days here to assist us in coming up on the New NLS means generally overseeing and providing helpful hints and guidance to the AKW group, bringing goodies in the form of Primers, Command Summaries, Scenarios and all that good stuff. 1c

However, this visit will not meet our needs for formalized training sessions of about ten hours for each of four groups of people. 1d

The following represents our thinking on what is needed, for whom it is needed and a first cut at a schedule. Ideally, we would like to start this training on Oct. 21 (This Year). Some preliminary discussion with Jim Norton when he was here led us to believe that it was not unrealistic to aspire to this level of effort. The timing was not specifically discussed. 1e

THE PLAN: 2

For purposes of training the potential trainees have been divided into four groups. The members of each group are allocated to the group on the basis of the sort of training that each needs, there is no implication of level of expertise or ability to learn. 2a

2a1

PSO Group 2a2

2a2a

Barbara DuRose 2a2b

Carmella Di Prospero 2a2c

Donna Robilotta 2a2d

Duayne Bathrick 2a2e

Marcelle Petell	2a2f
Marylyn Rossi	2a2g
Nettie Riolo	2a2h
Sharon Tetreault	2a2i
Becky Levine	2a2j
	2a3
AKW Group	2a4
	2a4a
Bobbie Carrier	2a4b
Duane Stone	2a4c
Ed Kennedy	2a4d
Ed LaForge	2a4e
Joe Cavano	2a4f
Roger Panara	2a4g
Tom Lawrence	2a4h
	2a5
USER Group	2a6
	2a7
Bill Rzepka	2a7a
Dean Bergstrom	2a7b
Frank Lamonica	2a7c
John McNamara	2a7d
Mike Wingfield	2a7e
Ray Liuzzi	2a7f
Roc Iuorno	2a7g

2a7h

NEW-USER Group 2a8

2a8a

Al Barnum 2a8b

Bob Krutz (also known as Col, or Sir) 2a8c

Dick Nelson 2a8d

Don Van Alstine 2a8e

Frank Sliwa 2a8f

Frank Tomaini 2a8g

Joe Femia 2a8h

Larry Lombardo 2a8i

Roger Weber 2a8j

2a8k

The training must be intensive and concentrated and therefore must be scheduled and the schedule must be strictly adhered to so as to take full advantage of the training to which we are entitled under our contract with SRI. Because of the heavy system loads, training must be scheduled outside of normal duty hours. A single training session must last for about two hours to be useful and to enable people to practice and interact with the instructor. 2b

The two groups that most need formal training are the PSD Group and the User Group. The AKW group and the New User Group can be handled more informally in the case of the AKW Group and perhaps later for the New User Group. 2c

2d

TRAINING SCHEDULE 2e

2e1

First Week 2e2

1700 - 1900 User Group 2e2a

Training for RADC on New NLS

1900 - 2100 PSO Group 2e2b

2e2c

Second Week 2e3

1700 - 1900 New Users Group 2e3a

1900 - 2100 AKW Group 2e3b

2e3c

ALTERNATE TRAINING SCHEDULE 2f

2f1

One Week 2f2

1100 - 1300 AKW Group 2f2a

1600 - 1800 User Group 2f2b

1800 - 2000 PSO Group 2f2c

2000 - 2200 New User Group 2f2d

2f2e

The time at which the sessions can be held is relatively fixed the assignment of groups to time slots was partly arbitrary and partly due to a recognition that some of the people are the ones who do the cooking for families and might find it better to go home and then return after supper. These things are always subject to negotiation. 2g

2h

I clearly recognize that this plan will be unpopular, but this is bullet-biting time. Our alternatives are to let chaos reign for a couple of months until people begin to learn and to train each other or to forget the whole thing. 2i

2j

As soon as the new NLS is available I can start the novices on the three lessons that I have on the NLS/SCHOLAR. If necessary we can end weekpone training until some time later but I don't think it is such a good idea. Although, on second thought,

until the system speeds up we are going to have a 'crunch' if everyone wants to get on at the same time to practice, 2k

Would you please give me your reaction to the proposed training plan, I am interested in knowing can it be done, will it be done and when will it be done, 3

If you consider it unfeasible, unreasonable or untimely, what do you propose to meet our objectives? 4

RJC 10-OCT-74 12:30 31149

Tickler for Oct & Nov 1974

1 October - Tuesday

News Brief items due into Becky Today,(KJOURNAL, 19533, 1:W)

Bobbie: Personnel Strength Rpt, due,

1300 hrs, Branch Chiefs Meeting

Due Date - ISI/T, Bucciero USAF Scientific Spinoff Fact Sheet - Completed

Due Date - ISIS/R, Motto Cont, F30602-73-C-0101 - Completed

2 October - Wednesday

ISC Confessions 0830 hrs,

3 October - Thursday

0830 hrs, Branch Chiefs Meeting

Laboratory Activity Reports due today: Bucciero must have them by 1000, ISM must have them by 1100, and DOT must have them by 1600,(KJOURNAL, 19513,1:W)

Due Date - ISI/T, Bucciero R&D Computer Facility Support to Contractors - Completed

4 October - Friday

Due Date - ISIS - Unsol Prop DO 29-75, "A COBOL Automatic Validation system" - Completed

7 October - Monday

DL Technology Review -IS is presently scheduled for 1515 - 1730 hrs,

Due Date - ISIM/W, Rzepka - F30602-73-C-0327 - Completed

Due Date - ISIS/M, Landes - Review of Draft Microform Software Documentation (Return to ISFA/T, Osinski) - Completed

Tickler for Oct & Nov 1974

8 October - Tuesday

DL Technology Review

1300 hrs, Branch Chiefs Meeting

9 October - Wednesday

DL Technical Technology

ISF Confessions 0830 hrs,

10 October - Thursday

Branch Chief's Meeting - 1500 hrs,

NOTICE - Mr, William Wolf, President of Wolf Computer Corp, will present DICTRAN - a new word processing system which enables man-machine communication using the spoken word, "In a word processing environment, the programmer would probably communicate his program at a rate of 100 words per minute or more, using a standard kind of dictation machine or other word processing system," Briefing will be held at 0930 hrs, in Bldg, 3, Conference Room 1006, For further details, contact Michael Landes, ISIS, X7546,

Laboratory Activity Reports due today: Bucciero must have them by 1000, ISM must have them by 1100, and DOT must have them by 1600,(KJOURNAL, 19513,1:w)

Due Date - ISIS - Proposed Release Software Reliability Study - F30602-74-C-0036

11 October - Friday

Timecards due today

14 October - Monday

Tickler for Oct & Nov 1974

Due Date - ISIM/D, Stone - Determination of Final Invention

F30602-72-C-0313 - SRI

Update <KENNEDY>VGRAPH for confessions

15 October - Tuesday

Due Date - Bucciero/Landes/Iuorno - Outside Employment - Completed

1300 hrs, Branch Chiefs Meeting

Collect topic write-ups by noon for confessions,

Due Date - ISIM/ISIS - Request AF Forms 1152s for USC Term III, 28 Oct through 20 Dec 74, courses be submitted to this office by 15 Oct 74, Courses to be offered are:

SSM 531 - Man-Machine Factors in Systems Management

SSM 510 - Aerospace Management Communication Theory

The NEW Tuition Rate is $291.00,

SSM 531 - Man-Machine Factors in Systems Management

SSM 510 - Aerospace Management Communication Theory

The NEW tuition rate is $291.00,

16 October - Wednesday

R & T Selection of the Month is due in ISI, (KJOURNAL, 19531, 1:W)

ISI Confessions 0830 hrs,

17 October - Thursday

0830 hrs, Branch Chiefs Meeting

Laboratory Activity Reports due today: Bucciero must have them by 1000, ISM must have them by 1100, and DOT must have them by 1600,(KJOURNAL, 19513,1:W)

18 October - Friday

RJC 10-OCT-74 12:30 31149

Tickler for Oct & Nov 1974

21 October - Monday

Due Date - ISIS/D, Mark - Final Report, Vol VII, F30602-74-C-0186 for technical review (IBM)

22 October - Tuesday

1300 hrs, Branch Chiefs Meeting

23 October - Wednesday

24 October - Thursday

0830 hrs, Branch Chiefs Meeting

Laboratory Activity Reports due today: Bucciero must have them by 1000, ISM must have them by 1100, and DOT must have them by 1600,(KJOURNAL, 19513,1:W)

25 October - Friday

Timecards due today

28 October - Monday

29 October - Tuesday

1300 hrs, Branch Chiefs Meeting

30 October - Wednesday

31 October - Thursday

0830 hrs, Branch Chiefs Meeting

Laboratory Activity Reports due today: Bucciero must have them by 1000, ISM must have them by 1100, and DOT must have them by 1600,(KJOURNAL, 19513,1:W)

Form 2's (employee time expenditures) are due today.

1 November - Friday

News Brief items due into Becky Today,(KJOURNAL, 19533, 1:W)

Tickler for Oct & Nov 1974

Bobbie: Personnel Strength Rpt. due.

4 November - Monday

5 November - Tuesday

1300 hrs, Branch Chiefs Meeting

6 November - Wednesday

ISC Confessions 0830 hrs.

7 November - Thursday

0830 hrs, Branch Chiefs Meeting

Laboratory Activity Reports due today: Bucciero must have them by 1000, ISM must have them by 1100, and DOT must have them by 1600.(KJOURNAL, 19513,1:W)

8 November - Friday

Timecards due today

11 November - Monday

12 November - Tuesday

1300 hrs, Branch Chiefs Meeting

13 November - Wednesday

ISF Confessions 0830 hrs.

14 November - Thursday

0830 hrs, Branch Chiefs Meeting

Laboratory Activity Reports due today: Bucciero must have them by 1000, ISM must have them by 1100, and DOT must have them by 1600.(KJOURNAL, 19513,1:W)

15 November - Friday

R & T Selection of the Month is due in ISI. (KJOURNAL, 19531, 1:W)

Tickler for Oct & Nov 1974

18 November - Monday

Update <KENNEDY>VGRAPH for confessions

19 November - Tuesday

1300 hrs. Branch Chiefs Meeting

Collect topic write-ups by noon for Confessions.

20 November - Wednesday

ISI Confessions 0830 hrs.

21 November - Thursday

0830 hrs. Branch Chiefs Meeting

Laboratory Activity Reports due today: Bucciero must have them by 1000, ISM must have them by 1100, and DOT must have them by 1600.(KJOURNAL, 19513,1:W)

22 November - Friday

Timecards due today

25 November - Monday

26 November - Tuesday

1300 hrs. Branch Chiefs Meeting

27 November - Wednesday

28 November - Thursday

0830 hrs. Branch Chiefs Meeting

Laboratory Activity Reports due today: Bucciero must have them by 1000, ISM must have them by 1100, and DOT must have them by 1600.(KJOURNAL, 19513,1:W)

29 November - Friday

Form 2's (employee time expenditures) are due today.

IAC SB STATUS IS ... IAC SE

Sender is stating his perception of the current status of Telnet options. The code for IS is 0. (See below.)

3. Default

DON'T STATUS/WON'T STATUS.

That is, the current status of options will not be discussed.

4. Motivation for the option

This option allows a user/process to verify the current status of Telnet options (e.g., echoing) as viewed by the person/process on the other end of the Telnet connection. Simply renegotiating options could lead to the nonterminating request loop problem discussed in (NIC #16237). The changes to the option, described in this paper, allow STATUS to fit into the normal structure of Telnet options, by deferring the actual transfer of status information to the SB command. Additionally, the numbers of bytes that must be sent to describe the state of the options has been considerably reduced.

5. Description of the option

WILL/DO are now used only to obtain and grant permission for future discussion. The actual exchange of status information occurs within option subcommands (IAC SB STATUS...).

Once the two hosts have exchanged a WILL and a DO, the sender of the WILL STATUS is free to transmit status information, spontaneously or in response to a request from the sender of the DO. At worst, this may lead to transmitting the information twice. Only the sender of the DO may send requests (IAC SB STATUS SEND IAC SE) and only the sender of the WILL may transmit actual status information (within an IAC SB STATUS IS ... IAC SE command).

IS has the subcommands WILL, DO and SB. They are used EXACTLY as used during the actual negotiation of Telnet options, except that SB is terminated with SE, rather than IAC SE. Transmission of SE, as a regular data byte, is accomplished by doubling the byte (SE SE). Options that are not explicitly described are assumed to be in their default states. A single IAC SB STATUS IS ... IAC SE describes the condition of ALL options.

The following is an example of use of the option:

Host1: IAC DO STATUS

Host2: IAC WILL STATUS

(Host2 is now free to send status information at any time. Solicitations from Host1 are NOT necessary. This should not produce any dangerous race conditions. At worst, two IS's will be sent.

Host1 (perhaps): IAC SB STATUS SEND IAC SE

Host2 (the following stream is broken into multiple lines only for readability. No carriage returns are implied.):

IAC SB STATUS IS

WILL ECHO

DO SUPPRESS-GO-AHEAD

WILL STATUS

DO STATUS

WILL RCTE

SB RCTE <11><1><24> SE

DO NAOL

SB NAOL DS <66> SE

IAC SE

Explanation of Host2's perceptions: It is responsible for echoing back the data characters it receives over the Telnet connection; it will not send Go-Ahead signals; it will both issue and request Status information; it will send instruction for controlling the other side's terminal printer; it will discuss the line width for data it is sending.

Some sample negotiations are:

no subnegotiations	data receiver handles output page size considerations
IAC SB NAOP DS 66 IAC SE IAC SB NAOP DR 0 IAC SE	data sender suggests data receiver handle output page size consideration data with suggested page size of 66 lines; receiver agrees.
IAC SB NAOP DR 255 IAC SE IAC SB NAOP DS 0 IAC SE	data receiver suggests data sender handle page size condiseration; sender refuses.
IAC SB NAOP DS 0 IAC SE IAC SB NAOP DR 30 IAC SE	data sender wants to handle page size considerations; receiver agrees but notifies the sender the scope only has 30 IAC SE lines.

As with all option negotiation, neither party should suggest a state already in effect except to refuse to negotiate; changes should be acknowledged; and once refused, an option should not be resuggested until "something changes" (e.g., another process starts).

At any time either party can disable further negotiation by giving the appropriate WON'T NAOP or DON'T NAOP command.

D. Crocker (UCLA-NMC)
RFC 652, NIC 31155 (Oct. 25, 1974)
Online file: [ISI]<DCROCKER>NAOCRD.TXT

TELNET OUTPUT CARRIAGE-RETURN DISPOSITION OPTION

1. Command name and code

   NAOCRD 10 (Negotiate About Output Carriage-Return Disposition)

2. Command meanings

   In the following, we are discussing a simplex connection, as described in the NAOL and NAOP Telnet options.

   IAC DO NAOCRD

      The data sender requests or agrees to negotiate about output carriage-return character disposition with the data receiver. In the case where agreement has been reached and in the absence of further subnegotiations, the data receiver is assumed to be handling output carriage-returns.

   IAC DON'T NAOCRD

      The data sender refuses to negotiate about output carriage-return disposition with the data receiver, or demands a return to the unnegotiated default mode.

   IAC WILL NAOCRD

      The data receiver requests or agrees to negotiate about output carriage-return disposition with the sender. In the case where agreement has been reached and in the absence of further subnegotiations, the data receiver alone is assumed to be handling output carriage-returns.

   IAC WON'T NAOCRD

      The data receiver refuses to negotiate about output carriage-return disposition, or demands a return to the unnegotiated default mode.

IAC SB NAOCRD DS <8-bit value> IAC SE

The data sender specifies, with the 8-bit value, which party should handle carriage-returns and what their disposition should be. The code for DS is 1.

IAC SB NAOCRD DR <8-bit value> IAC SE

The data receiver specifies, with the 8-bit value, which party should handle carriage-returns and what their disposition should be. The code for DR is 0.

3. Default

DON'T NAOCRD/WON'T NAOCRD.

In the default absence of negotiations concerning which party, data sender or data receiver, is handling output carriage-returns, neither party is required to handle carriage-returns and neither party is prohibited from handling them; but it is appropriate if at least the data receiver handles carriage-returns, albeit primitively.

4. Motivation for the Option

Please refer to section 4 of the NAOL and of the NAOP Telnet option descriptions.

5. Description of the Option

The data sender and the data receiver use the 8-bit value along with the NAOCRD SB commands as follows:

8-bit value	Meaning
0	Command sender suggests that he alone will handle carriage-returns, for the connection.
1 to 250	Command sender suggests that the other party alone should handle carriage-returns, but suggests that a delay of the indicated value be used. The value is the number of character-times to wait or number of NULs to insert in the data stream before sending the next data character. (See qualification, below.)
251	Not allowed, in order to be compatible with related Telnet options.

252	Command sender suggests that the other party alone handle carriage-returns, but suggests that they be discarded.
253	Not allowed, in order to be compatible with related Telnet options.
254	Command sender suggests that the other party alone should handle carriage-returns but suggests waiting for a character to be transmitted (on the other simplex connection) before sending more data. (See qualification, below.) Note that, due to the assynchrony of the two simplex connections, phase problems can occur with this option.
255	Command sender suggests that the other party alone should handle carriage-returns and suggests nothing about how it should be done.

The guiding rules are that:

1) if neither data receiver nor data sender wants to handle carriage-returns, the data receiver must do it, and

2) if both data receiver and data sender want to handle carriage-returns, the data sender gets to do it.

The reasoning for the former rule is that if neither wants to do it, then the default in the NAOCRD option dominates. If both want to do it, the sender, who is presumed to have special knowledge about the data, should be allowed to do it, taking into account any suggestions the receiver may make.

Note that carriage-return delays, controlled by the data sender, must consist of NUL characters inserted immediately after the character in question. This is necessary due to the assynchrony of network transmissions. Due to the Telnet end-of-line convention, with carriage-returns followed by a linefeed, any NULs that would otherwise be placed after the carriage-return must be placed after the linefeed, regardless of any modifications that may additionally be made to the line feed (see NAOLFD Telnet option).

As with all option negotiations, neither party should suggest a state already in effect except to refuse to negotiate; changes should be acknowledged; and once refused, an option should not be resuggested until "something changes" (e.g., another process starts).

At any time, either party can disable further negotiation by giving the appropriate WON'T NAOCRD or DON'T NAOCRD command.

D. Crocker (UCLA-NMC)
RFC 653, NIC #31156 (Oct. 25, 1974)
Online file: [ISI]<DCROCKER>NAOHTS.TXT

TELNET Output Horizontal Tabstops Option

1. Command name and code

NAOHTS 11 (Negotiate About Output Horizontal Tabstops)

2. Command meanings

In the following, we are discussing a simplex connection, as described in the NAOL and NAOP Telnet options.

IAC DO NAOHTS

The data sender requests or agrees to negotiate about output horizontal tabstops with the data receiver. In the case where agreement has been reached and in the absence of further subnegotiations, the data receiver is assumed to be handling output horizontal tabstops.

IAC DON'T NAOHTS

The data sender refuses to negotiate about output horizontal tabstops with the data receiver, or demands a return to the unnegotiated default mode.

IAC WILL NAOHTS

The data receiver requests or agrees to negotiate about output horizontal tabstops with the sender. In the case where agreement has been reached and in the absence of further subnegotiations, the data receiver alone is assumed to be handling output horizontal tabstops.

IAC WON'T NAOHTS

The data receiver refuses to negotiate about output horizontal tabstops, or demands a return to the unnegotiated default mode.

IAC SB NAOHTS DS <8-bit value> ... <8-bit value> IAC SE

The data sender specifies, with the 8-bit value(s), which party should handle output horizontal tabstop considerations and what the stops should be. The code for DS is 1.

IAC SB NAOHTS DR <8-bit value> ... <8-bit value> IAC SE

The data receiver specifies, with the 8-bit value(s), which party should handle output horizontal tabstop considerations and what the stops should be. The code for DR is 0.

3. Default

DON'T NAOHTS/WON'T NAOHTS.

In the default absence of negotiations concerning which party, data sender or data receiver, is handling output horizontal tabstops, neither party is required to handle them and neither party is prohibited from handling them; but it is appropriate if at least the data receiver handles horizontal tabstops, albeit primitively.

4. Motivation for the Option

Please refer to section 4 of the NAOL and of the NAOP Telnet option descriptions.

5. Description of the Option

The data sender and the data receiver use the 8-bit value(s) along with the DS and DR SB subcommands as follows (multiple 8-bit values are allowed only if each is greater than zero and less than 251):

8-bit value	Meaning
0	Command sender suggests that he alone will handle tabstops, for the connection.
1 to 250	Command sender suggests that the other party alone should handle tabstop considerations, but suggests that the indicated value(s) be used. The value(s) are the column numbers, relative to the physical left side of the printer page or terminal screen, that are to be set.
251 to 254	Not allowed, in order to be compatible with related Telnet options.

255 Command sender suggests that the other party alone should handle output tabstops and suggests nothing about how it should be done.

The guiding rules are that:

(1) if neither data receiver nor data sender wants to handle output horizontal tabstops, the data receiver must do it, and

(2) if both data receiver and data sender want to handle output horizontal tabstops, the data sender gets to do it.

The reasoning for the former rule is that if neither wants to do it, then the default in the NAOHTS option dominates. If both want to do it, the sender, who is presumed to have special knowledge about the data, should be allowed to do it, taking into account any suggestions the receiver may make.

As with all option negotiations, neither party should suggest a state already in effect except to refuse to negotiate; changes should be acknowledged; and once refused, an option should not be resuggested until "something changes" (e.g., another process starts).

At any time, either party can disable further negotiation by giving the appropriate WON'T NAOHTS or DON'T NAOHTS command.

D. Crocker (UCLA-NMC)
RFC 654, NIC 31157 (Oct. 25, 1974)
Online file: [ISI]<DCROCKER>NAOHTD.TXT

TELNET Output Horizontal Tab Disposition Option

1. Command name and code

NAOHTD 12

(Negotiate About Output Horizontal Tab Disposition)

2. Command meanings

In the following, we are discussing a simplex connection, as described in the NAOL and NAOP Telnet options.

IAC DO NAOHTD

The data sender requests or agrees to negotiate about output horizontal tab character disposition with the data receiver. In the case where agreement has been reached and in the absence of further subnegotiations, the data receiver is assumed to be handling output horizontal tab character considerations.

IAC DON'T NAOHTD

The data sender refuses to negotiate about output horizontal tab characters with the data receiver, or demands a return to the unnegotiated default mode.

IAC WILL NAOHTD

The data receiver requests or agrees to negotiate about output horizontal tab characters with the sender. In the case where agreement has been reached and in the absence of further subnegotiations, the data receiver alone is assumed to be handling output horizontal tab character considerations.

IAC WON'T NAOHTD

The data receiver refuses to negotiate about output horizontal tab characters, or demands a return to the unnegotiated default mode.

IAC SB NAOHTD DS <8-bit value> IAC SE

The data sender specifies, with the 8-bit value, which party should handle output horizontal tab characters and what their disposition should be. The code for DS is 1.

IAC SB NAOHTD DR <8-bit value> IAC SE

The data receiver specifies, with the 8-bit value, which party should handle output horizontal tab characters and what their disposition should be. The code for DR is 0.

3. Default

DON'T NAOHTD/WON'T NAOHTD.

In the default absence of negotiations concerning which party, data sender or data receiver, is handling output horizontal tab character considerations, neither party is required to handle horizontal tab characters and neither party is prohibited from handling them; but it is appropriate if at least the data receiver handles horizontal tab character considerations, albeit primitively.

Motivation for the Option

Please refer to section 4 of the NAOL and of the NAOP Telnet option descriptions.

5. Description of the Option

The data sender and the data receiver use the 8-bit value along with the DS and DR SB commands as follows:

8-bit value	Meaning
0	Command sender suggests that he alone will handle horizontal tab characters, for the connection.
1 to 250	Command sender suggests that the other party alone should handle horizontal tab characters, but suggests that a delay of the indicated value be used. The value is the number of character-times to wait or number of NULs to insert in the data stream before sending the next data character.

251 Command sender suggests that the other party alone handle horizontal tabs, but suggests that each occurrence of the character be replaced by a space.

252 Command sender suggests that the other party alone handle horizontal tabs, but suggests that they be discarded.

253 Command sender suggests that the other party alone should handle horizontal tab characters, but suggests that tabbing be simulated.

254 Command sender suggests that the other party alone should handle horizontal tab characters, but suggests that waiting for a character to be transmitted (on the other simplex connection) before sending more data. Note that, due to the assynchrony of the two simplex connections, phase problems can occur with this option.

255 Command sender suggests that the other party alone should handle output horizontal tabs and suggests nothing about how it should be done.

The guiding rules are that:

1) if neither data receiver nor data sender wants to handle output horizontal tab characters, the data receiver must do it, and

2) if both data receiver and data sender wants to handle output horizontal tab characters, the data sender gets to do it.

The reasoning for the former rule is that if neither wants to do it, then the default in the NAOHTD option dominates. If both want to do it, the sender, who is presumed to have special knowledge about the data, should be allowed to do it, taking into account any suggestions the receiver may make.

Simulation is defined as the replacement of the horizontal tab character by enough spaces to move the printer head (or line-pointer) to the next horizontal tab stop.

Note that delays, controlled by the data sender, must consist of NUL characters inserted immediately after the horizontal tab character. This is necessary due to the assynchrony of network transmissions.

As with all option negotiations, neither party should suggest a state already in effect except to refuse to negotiate; changes should be acknowledged; and once refused, an option should not be resuggested until "something changes" (e.g., another process starts).

At any time, either party can disable further negotiation by giving the appropriate WON'T NAOHTD or DON'T NAOHTD command.

D. Crocker (UCLA-NMC)
RFC 655, NIC 31158 (Oct. 25, 74)
Online file: [ISI]<DCROCKER>NAOFFD.TXT

TELNET Output Formfeed Disposition Option

1. Command name and code

   NAOFFD - 13

   (Negotiate About Output Formfeed Disposition)

2. Command meanings

   In the following, we are discussing a simplex connection, as described in the NAOL and NAOP Telnet Options specifications.

   IAC DO NAOFFD

   The data sender requests or agrees to negotiate about output formfeed disposition with the data receiver. In the case where agreement has been reached and in the absence of further subnegotiations, the data receiver is assumed to be handling output formfeeds.

   IAC DON'T NAOFFD

   The data sender refuses to negotiate about output formfeed disposition with the data receiver, or demands a return to the unnegotiated default mode.

   IAC WILL NAOFFD

   The data receiver requests or agrees to negotiate about output formfeed disposition with the sender. In the case where agreement has been reached and in the absence of further subnegotiations, the data receiver alone is assumed to be handling output formfeeds.

   IAC WON'T NAOFFD

   The data receiver refuses to negotiate about output formfeed disposition, or demands a return to the unnegotiated default mode.

IAC SB NAOFFD DS <8-bit value> IAC SE

The data sender specifies, with the 8-bit value, which party should handle formfeeds and what their disposition should be. The code for DS is 1.

IAC SB NAOFFD DR <8-bit value> IAC SE

The data receiver specifies, with the 8-bit value, which party should handle formfeeds and what their disposition should be. The code for DR is 0.

3. Default

DON'T NAOFFD/WON'T NAOFFD

In the default absence of negotiations concerning which party, data sender or data receiver, is handling output formfeeds, neither party is required to handle formfeeds and neither party is prohibited from handling them; but it is appropriate if at least the data receiver handles formfeed considerations, albeit primitively.

4. Motivation for the Option

Please refer to section 4 of the NAOL and of the NAOFFD Telnet option descriptions.

5. Description of the Option

The data sender and the data receiver use the 8-bit value along with the DS and DR SB commands as follows:

8-bit value	Meaning
0	Command sender suggests that he alone will handle formfeeds, for the connection.
1 to 250	Command sender suggests that the other party alone should handle formfeeds, but suggests that the indicated value be used. The value is the number of character-times to wait or number of NULs to insert in the data stream before sending the next data character.

251 Command sender suggests that the other party alone handle formfeeds, but suggests that each occurrence of the character be replaced by carriage-return/line-feed.

252 Command sender suggests that the other party alone handle formfeeds, but suggests that they be discarded.

253 Command sender suggests that the other party alone should handle formfeeds, but suggests that formfeeds be simulated.

254 Command sender suggests that the other party alone should handle output formfeeds but suggests waiting for a character to be transmitted (on the other simplex connection) before sending more data. Note that, due to the assynchrony of the two simplex connections, phase problems can occur with this option.

255 Command sender suggests that the other party alone should handle output formfeeds and suggests nothing about how it should be done.

The guiding rules are that:

1) if neither data receiver nor data sender wants to handle output formfeeds, the data receiver must do it, and

2) if both data receiver and data sender want to handle output formfeeds, the data sender gets to do it.

The reasoning for the former rule is that if neither wants to do it, then the default in the NAOFFD option dominates. If both want to do it, the sender, who is presumed to have special knowledge about the data, should be allowed to do it, taking into account any suggestions the receiver may make.

Simulation is defined as the replacement of the formfeed character by enough line-feeds (only) to advance the paper (or line-pointer) to the top of the next page (or to the top of the terminal screen).

Note that delays, controlled by the data sender, must consist of NUL characters inserted immediately after the formfeed character. This is necessary due to the assynchrony of network transmission.

As with all option negotiations, neither party should suggest a state already in effect except to refuse to negotiate; changes should be acknowledged; and once refused, an option should not be resuggested until "something changes" (e.g., another process starts).

At any time, either party can disable further negotiation by giving the appropriate WON'T NAOFFD or DON'T NAOFFD command.

D. Crocker (UCLA-NMC)
RFC 656, NIC 31159 (Oct. 25, 1974)
Online file: [ISI]<DCROCKER>NAOVTS.TXT

TELNET Output Vertical Tabstops Option

1. Command name and code

NAOVTS 14

(Negotiate About Vertcial Tabstops)

2. Command meanings

In the following, we are discussing a simplex connection, as described in the NAOL and NAOP Telnet Options specifications.

IAC DO NAOVTS

The data sender requests or agrees to negotiate about output vertical tabstops with the data receiver. In the case where agreement has been reached and in the absence of further subnegotiations, the data receiver is assumed to be handling output vertical tabstop considerations.

IAC DON'T NAOVTS

The data sender refuses to negotiate about output vertical tabstops with the data receiver, or demands a return to the unnegotiated default mode.

IAC WILL NAOVTS

The data receiver requests or agrees to negotiate about output vertical tabstops with the sender. In the case where agreement has been reached and in the absence of further subnegotiations, the data receiver alone is assumed to be handling output vertical tabstop considerations.

IAC WON'T NAOVTS

The data receiver refuses to negotiate about output vertical tabstops, or demands a return to the unnegotiated default mode.

IAC SB NAOVTS DS <8-bit value> ... <8-bit value> IAC SE

The data sender specifies, with the 8-bit value(s), which party should handle output vertical tabstop considerations and what the stops should be. The code for DS is 1.

IAC SB NAOVTS DR <8-bit value> ... <8-bit value> IAC SE

The data receiver specifies, with the 8-bit value(s), which party should handle output vertical tabstop considerations and what the stops should be. The code for DR is 0.

3. Default

DON'T NAOVTS/WON'T NAOVTS.

In the default absence of negotiations concerning which party, data sender or data receiver, is handling output vertical tabstop considerations, neither party is required to handle vertical tabstops and neither party is prohibited from handling them; but it is appropriate if at least the data receiver handles vertical tabstop considerations, albeit primitively.

4. Motivation for the Option

Please refer to section 4 of the NAOL and of the NAOVTS Telnet option descriptions.

5. Description of the Option

The data sender and the data receiver use the 8-bit value(s) along with the DS and DR SB commands as follows (multiple 8-bit values are allowed only if each is greater than zero and less than 251):

8-bit value	Meaning
0	Command sender suggests that he alone will handle the vertical tabstops, for the connection.
1 to 250	Command sender suggests that the other party alone should handle the stops, but suggests that the indicated value(s) be used. Each value is the line number, relative to the top of the printer page or terminal screen, that is to be set as a vertical tabstop.

251 to 254	Not allowed, in order to be compatible with related Telnet options.
255	Command sender suggests that the other party alone should handle output vertical tabstops and suggests nothing about how it should be done.

The guiding rules are that:

1) if neither data receiver nor data sender wants to handle output vertical tabstops, the data receiver must do it, and

2) if both data receiver and data sender want to handle output vertical tabstops, the data sender gets to do it.

The reasoning for the former rule is that if neither wants to do it, then the default in the NAOVTS option dominates. If both want to do it, the sender, who is presumed to have special knowledge about the data, should be allowed to do it, taking into account any suggestions the receiver may make. This is necessary due to the assynchrony of network transmissions.

As with all option negotiations, neither party should suggest a state already in effect except to refuse to negotiate; changes should be acknowledged; and once refused, an option should not be resuggested until "something changes" (e.g., another process starts).

At any time, either party can disable further negotiation by giving the appropriate WON'T NAOVTS or DON'T NAOVTS command.

D. Crocker (UCLA-NMC)
RFC 657, NIC 31160 (Oct. 25, 1974)
Online file: [ISI]<DCROCKER>NAOVTD.TXT

TELNET Output Vertical Tab Disposition Option

1. Command name and code

NAOVTD 15

(Negotiate About Output Vertcial Tab Disposition)

2. Command meanings

In the following, we are discussing a simplex connection, as described in the NAOL and NAOP Telnet Options specifications.

IAC DO NAOVTD

The data sender requests or agrees to negotiate about output vertical tab character disposition with the data receiver. In the case where agreement has been reached and in the absence of further subnegotiations, the data receiver is assumed to be handling output vertical tab character considerations.

IAC DON'T NAOVTD

The data sender refuses to negotiate about output vertical tab character disposition with the data receiver, or demands a return to the unnegotiated default mode.

IAC WILL NAOVTD

The data receiver requests or agrees to negotiate about output vertical tab character disposition with the sender. In the case where agreement has been reached and in the absence of further subnegotiations, the data receiver alone is assumed to be handling output vertical tab character considerations.

IAC WON'T NAOVTD

The data receiver refuses to negotiate about output vertical tab character disposition, or demands a return to the unnegotiated default mode.

IAC SB NAOVTD DS <8-bit value> IAC SE

The data sender specifies, with the 8-bit value, which party should handle output vertical tab characters and what their disposition should be. The code for DS is 1.

IAC SB NAOVTD DR <8-bit value> IAC SE

The data receiver specifies, with the 8-bit value, which party should handle output vertical tab characters and what their disposition should be. The code for DR is 0.

3. Default

DON'T NAOVTD/WON'T NAOVTD

In the default absence of negotiations concerning which party, data sender or data receiver, is handling output vertical tab character considerations, neither party is required to handle vertical tab characters and neither party is prohibited from handling them; but it is appropriate if at least the data receiver handles vertical tab character considerations, albeit primitively.

4. Motivation for the Option

Please refer to section 4 of the NAOL and of the NAOVTD Telnet option descriptions.

5. Description of the Option

The data sender and the data receiver use the 8-bit value along with the DS and DR SB commands as follows:

8-bit value	Meaning
0	Command sender suggests that he alone will handle vertical tab characters, for the connection.
1 to 250	Command sender suggests that the other party alone should handle tab characters, but suggests that a delay of the indicated value be used. The value is the number of character-times to wait or number of NULs to insert in the data stream before sending the next data character.

251 Command sender suggests that the other party alone handle vertical tabs, but suggests that each occurrence of the character be replaced by carriage-return/linefeed.

252 Command sender suggests that the other party alone handle vertical tabs, but suggests that they be discarded.

253 Command sender suggests that the other party alone should handle tab characters, but suggests that tabbing be simulated.

254 Command sender suggests that the other party alone should handle the output disposition but suggests waiting for a character to be transmitted (on the other simplex connection) before sending more data. Note that, due to the assynchrony of the two simplex connections, phase problems can occur with this option.

255 Command sender suggests that the other party alone should handle the output disposition and suggests nothing about how it should be done.

The guiding rules are that:

1) if neither data receiver nor data sender wants to handle the output vertical tab characters, the data receiver must do it, and

2) if both data receiver and data sender want to handle the output vertical tab characters, the data sender gets to do it.

The reasoning for the former rule is that if neither want to do it, then the default in the NAOVTD option dominates. If both want to do it, the sender, who is presumed to have special knowledge about the data, should be allowed to do it, taking into account any suggestions the receiver may make.

Simulation is defined as the replacement of the character by enough line-feeds (only) to advance the paper (or line-pointer) to the next vertical tab stop.

Note that delays, controlled by the data sender, must consist of NUL characters, inserted immediately after the line-feed character. This is necessary due to the assynchrony of network transmissions.

As with all option negotiations, neither party should suggest a state already in effect except to refuse to negotiate; changes should be acknowledged; and once refused, an option should not be resuggested until "something changes" (e.g., another process starts).

At any time, either party can disable further negotiation by giving the appropriate WON'T NAOVTD or DON'T NAOVTD command.

. Crocker (UCLA-NMC)
RFC 658, NIC 31161 (Oct. 25, 1974)
Online file: [ISI]<DCROCKER>NAOLFD.TXT

TELNET OUTPUT LINEFEED DISPOSITION

1. Command name and code

NAOLFD 16

(Negotiate About Output Linefeed Disposition)

2. Command meanings

In the following, we are discussing a simplex connection, as described in the NAOL and NAOP Telnet Options.

IAC DO NAOLFD

The data sender requests or agrees to negotiate about output linefeed disposition with the data receiver. In the case where agreement has been reached and in the absence of further subnegotiations, the data receiver is assumed to be handling output linefeed considerations.

IAC DON'T NAOLFD

The data sender refuses to negotiate about output linefeed disposition with the data receiver, or demands a return to the unnegotiated default mode.

IAC WILL NAOLFD

The data receiver requests or agrees to negotiate about output linefeed disposition with the sender. In the case where agreement has been reached and in the absence of further subnegotiations, the data receiver alone is assumed to be handling output linefeed considerations.

IAC WON'T NAOLFD

The data receiver refuses to negotiate about output linefeed disposition, or demands a return to the unnegotiated default mode.

IAC SB NAOLFD DS <8-bit value> IAC SE

The data sender specifies, with the 8-bit value, which party should handle output linefeeds and what their disposition should be. The code for DS is 1.

IAC SB NAOLFD DR <8-bit value> IAC SE

The data receiver specifies, with the 8-bit value, which party should handle output linefeeds and what their disposition should be. The code for DR is 0.

3. Default

DON'T NAOLFD/WON'T NAOLFD.

In the default absence of negotiations concerning which party, data sender or data receiver, is handling output linefeed considerations, neither party is required nor prohibited from handling linefeeds; but it is appropriate if at least the data receiver handles them, albeit primitively.

4. Motivation for the Option

Please refer to section 4 of the NAOL and of the NAOLFD Telnet option descriptions.

5. Description of the Option

The data sender and the data receiver use the 8-bit value along with DS and DR SB commands as follows:

8-bit value	Meaning
0	Command sender suggests that he alone will handle linefeeds, for the connection.
1 to 250	Command sender suggests that the other party alone should handle linefeeds, but suggests that a delay of the indicated value be used. The value is the number of character-times to wait or number of NULs to insert in the data stream before sending the next data character. (See qualifications, below.)
251	Not allowed, in order to be compatible with related Telnet options.

252 Command sender suggests that the other party alone handle linefeeds, but suggests that they be discarded.

253 Command sender suggests that the other party alone should handle linefeeds, but suggests that linefeeds be simulated.

254 Command sender suggests that the other party alone should handle output linefeeds but suggests waiting for a character to be transmitted (on the other simplex connection) before sending more data. (See qualifications, below.) Note that, due to the assynchrony of the two simplex connections, phase problems can occur with this option.

255 Command sender suggests that the other party alone should handle output linefeeds and suggests nothing about how it should be done.

The guiding rules are that:

1) if neither data receiver nor data sender wants to handle output linefeeds, the data receiver must do it, and

2) if both data receiver and data sender want to handle output linefeed disposition, the data sender gets to do it.

The reasoning for the former rule is that if neither wants to do it, then the default in the NAOLFD option dominates. If both want to do it, the sender, who is presumed to have special knowledge about the data, should be allowed to do it, taking into account any suggestions the receiver may make.

Simulation is defined as the replacement of the linefeed character by new-line (see following) and enough blanks to move the print head (or line pointer) to the same lateral position it occupied just prior to receiving the linefeed. To avoid infinite recursion, such simulation is allowed only for linefeed characters that are not immediately preceded by carriage-returns (that is, part of a Telnet new-line combination). It is assumed that linefeed simulation will be necessary for printers that do not have a separate linefeed (like the IBM 2741); in this case, end-of-line character padding can be specified through NAOCRD. Any padding (0 < <8-bit-value> < 251) of linefeed characters is to be done for ALL linefeed characters.

NOTE: Delays, controlled by the data sender, must consist of NUL characters inserted immediately after the character. This is necessary due to the assynchrony of network transmissions. Additionally, due to the presence of the Telnet end-of-line convention, it may be necessary to add carriage-return padding or delay after the associated linefeed (see NAOCRD Telnet option).

As with all option negotiations, neither party should suggest a state already in effect except to refuse to negotiate; changes should be acknowledged; and once refused, an option should not be resuggested until "something changes" (e.g., another process starts).

At any time, either party can disable further negotiation by giving the appropriate WON'T NAOLFD or DON'T NAOLFD command.

RSR 12-OCT-74 19:19 31162

Re: staffing factors

Rob, I've read your 12 Oct. message re the staffing factors work; this is in response. 1

I looked at your pls file, right on! 2

In response to Bairs comment I've looked in his plant file, and have revised the staffing relationships section as to the user development branch. Replace with the following branch. I think this will be more acceptable to him. As he well knows, this sort of functional breakdown is never completely clean. 3

Also this is not a final product but a working document. 4

Staffing Relationships 5

Proportionalities: 5a

Constant 5a1

(in which quarters) 5a2

Staff 5a3

Clients, by age in quarters 5a4

<=-1 -1 0 1 1-4 >4 5a5

Management 5b

Manager 5b1

Contract Admin 5b2

Admin Asst 5b3

Secretary 5b4

Bus. Analysis 5b5

Marketing 5c

Hardware 5d

Software 5e

Maintenance 5e1

Development 5e2

Re: staffing factors

User DeVelopment	5f
Instruct. Devel	5f1
Training packages for general and special purposes	5f1a
User devel. handbook	5f1b
Training Clients	5f2
Training ARC Staff	5f3
User responsive functions	5f4
Guidance and Consultation	5f4a
Feedback coordination	5f4b
User Reqts. Analysis	5f5
User description	5f5a
Analytical reporting	5f5b
Demos	5f6
Architect Liaison	5g
Writing	5h
Contract Staff	5i

JI 14-OCT-74 05:45 31163

Answer to FEEDBACK request

Jim; Since the Feedback committee is in limbo, I see absolutly no reason why you shouldn't use the ident FEEDBAACK for whatevver purposes you have in mind. Best,Jean 1

BJM 14-OCT-74 13:34 31165

Dear Jim, I'm sorry that we were not able to get together when you were here visiting Ernie. I wanted to speak to you personally to tell you of my recent decision to return to North Carolina, and consequently to forsake the ARC-KWAC-NLS experience. I have enjoyed my work (and recreation) with everyone involved, and will miss being in on the development of a viable and truly productive community. I hope to keep informally in touch and watch this whole thing evolve, Good luck for the future. Brian 1

(J31165) 14-OCT-74 13:34;;;; Title: Author(s): Brian J. McNally/BJM; Distribution: /JCN([INFO-ONLY]) ; Sub-Collections: KWAC NIC; Clerk: BJM;

(J31166) 14-OCT-74 13:37;;;; Title: Author(s): Brian J. McNally/BJM; Sub-Collections: NIC; Clerk: BJM;

Scenario rationales previously written

Mike, here are some negative desciptions of conferencing, etc. They are overly pessimistic to counter the optimistic desccriptions one gets from proponents of systems who are 'selling' their particular software package. 1

Appendix:The following are rationales for negative scenarios based on BPG experiences; rationales advocating the opposite point of view will be written as a basis for positive scenarios. Negative rationales have been written first because positive scenarios can be easily generated by paraphrasing the relevant literature. 1a

Computer Text-Editing 1a1

The BPG has had access to a sophisticated text-editing computer system for a year. About six of nine knowledge workers use the system, of whom three are using only the simplest text-editing features. One of the rationales for the system was that of increasing the size of a common information space. In practice, the capability for scanning other knowledge workers' files is used very rarely, and then only to monitor the progress of subordinates. A second rationale was to eliminate the need for introducing clerical help and accompanying lags in the production of routine documents and letters. In actual fact, most members have reverted to having letters transcribed by typists and there has been an increase in clerical assistance since the introduction of text-editing because some individuals are typing in information files that might not ordinarily be transcribed from source documents. 1a1a

Originally, the system was meant to multiply the force of knowledge workers and hence increase productivity and efficiency. The theory states that a knowledge worker can produce reports more swiftly because much of the clerical leg-work has been eliminated or simplified. Rather than write a document in conventional serial fashion, much of the text is quickly composed by cutting and pasting previously written documents or items from information retrieval bases. This could be very useful for prolific repackagers of information but there are very few people who do this as part of their normal job. For instance, in the BPG, since most reports written by lower level employees are based on original analyses, there has not been any noticeable improvement in rate of output. Of course, simple text-editors such as IBM's SCRIPT have a much bigger market because much of ordinary business documentation is routine, e.g., there is an IBM advertisement showing how legislators can keep track of bills as they are amended and voted on. In general, the legal profession seems to be a ripe market for

word processing where inputting and editing are fairly straightforward. 1a1b

Computer Conferencing 1a2

Despite our readily available terminals, an in-built bias to use terminals, potential strong links with colleagues in similar environments (BNR, Bell, Paul Polishuk, and IFF), computer conferencing has not taken off. Several conferences were initiated in September, 1973 after a favourable initial reaction to the concept and the 'new toy' syndrome but when the momentum was lost for two weeks over the Christmas period, they never got accessed after work returned to normal in January. This may be due to an inherent great weakness in the concept since feedback to suggestions or ideas is very slow (two days compared to two seconds on POT). In addition, the recording of all communications for posterity may lead to very cautious statements (would you want all your phone calls on tape?). Finally, as Cherry and other communication researchers have suggested, the potential strengths of communications devices are rarely appreciated ahead of time(e.g., the telephone was envisaged solely as an aid for the deaf). The fact, that despite a year's exposure to conferencing few new insights into applications have resulted, suggests that the communications needs that conferencing might fill may be better served by existing tools such as the telephone. 1a2a

Information Retrieval 1a3

Despite the fact that information retrieval systems have been tried on several occasions in the BPG, no such system is actively used by the BPG staff. Some argue that this is due to insufficient data bases. The argument is valid but will, unfortunately always be true no matter how much effort is put into constructing a retrieval system since there will inevitably be a huge amount of legwork necessary to keep a data base up to date. The failures are also due to the fact that they substitute for tasks that are, in fact, rarely carried out. For example, few members ever have occasion to look up specific forecasts and so there is no reason for them to use the Futures Information System. Another example is the chartbook data base. While the idea of being able to write up working papers on short notice sounds appealing, most of the BPG members hardly ever give formal talks. Therefore they have little or no use for the system. In addition, it is very rarely the case that we have severe time constraints imposed, and so the appeal of swift documentation is suspect. 1a3a

Scenario rationales previously written

The recent evaluation of the Quic-Law system at Queen's by Professor Slayton should be a valuable lesson. To the layman, it seems that a lawyer spends much of his time in the mundane task of tracking down laws and precedents of relevance to a particular case. This seems to be easily programmable since the body of law is very clearly delineated and elements in cases are easily classified by keywords. After implementing a legal information system, it was noted that the process of analogy is much more important than programmers first thought and that, in fact, it may be difficult if not impossible to build in this feature. 1a3b

If information retrieval does not work in this environment, one must question whether it will ever work in the more unstructured and hazy environments of business at large. In creating business data bases, does one include business statistics, business periodicals, or even the daily newspaper, since all of these are inputs to the managerial decision-making process? Keeping such bases up to date may be a very large clerical task that will be costly even if computer costs were to go down greatly. 1a3c

PF 15-OCT-74 05:26 31167

Scenario rationales previously written

(J31167) 15-OCT-74 05:26; Title: Author(s): Phil Feldman/PF;
Distribution: /MTB PF; Sub-Collections: NIC; Clerk: PF;

Costs of Engelbart

Mike here are some observations on the 'real costs'(1a1a) of your outline, 1

I think that all costs to Bell that would not have been incurred had we not adopted Engelbart should be included: 1a

thus the $3000 for Montreal MUX is as costly to Bell as the $3000 for the San Jose one even though 'this is not a cash item', the MUX unit on our floor is a very real cost to Bell as is the technicians' opportunity costs every time we call them up to repair the unit, 1b

the private line to Cal, is $30000 not $3000(typo)(1a1a2a) 1c

evenif we had franked (whatever that means) the long distance, the $30,000 would have been included since it represents an increamental construction of plant ultimately(we install plant continually so that the traffic people are able to meet certain quality criteria(say,9 out of 10 calls get through first time), 1d

Biggest real cost is salary and loaded costs of personnel - here is a very rough calculation* 1e

(I am including learning curve costs, costs associated with spending amount of time 'showing off' system, and costs associated with managing implementation of hardware) 1f

DMA-$45k x 10%=4,5k 1f1

LHD-$35k x 20%=7k 1f2

MTB-$25k x 40%=10k 1f3

IMM-20k x 75%=15k 1f4

PF-$25k x 20%=10k 1f5

PIW-$25k x 20%=10k 1f6

clerks and secretaries(no idea) 1f7

the total is $55k + per year, 1f8

Total =30,000+9,000+15,000+40,000+55,000=$149,000 + 1g

if we had computer in Montreal, cost would still be 149,000-30,000=119,000 to each user since the implementation costs and learning costs would be expected in each new location, 1g1

PF 15-OCT-74 08:21 31168

Costs of Engelbart

(J31168) 15-OCT-74 08:21; Title: Author(s): Phil Feldman/PF;
Distribution: /MTB PF; Sub-Collections: NIC; Clerk: PF;

EJK 15-OCT-74 11:48 31169

User-progs that seem to be working as of now.

These seem to be the only ones that work. Note: They are all ccontent analyzers or sort key programs. None of the REL things seem to work.

EJK 15-OCT-74 11:48 31169

User-progs that seem to be working as of now.

< USER-PROGS, -CONTENTS.NLS;14, > 1

< USER-PROGS, -USERGUIDE.NLS;3, > 2

< USER-PROGS, ADDNAME.CA;1, > 3

< USER-PROGS, DELDIR.CA;1, > 4

< USER-PROGS, JFORM2.CA;1, > 5

< USER-PROGS, JFORM3.CA;2, > 6

< USER-PROGS, SHOWDIR.CA;1, > 7

< USER-PROGS, SORTMES.SK;1, > 8

< USER-PROGS, SORTNMSKP.SK;1, > 9

< USER-PROGS, SORTNOCASE.SK;1, > 10

< USER-PROGS, SORTNUM.SK;1, > 11

< USER-PROGS, SORTREV.SK;1, > 12

< USER-PROGS, SRIFORM.CA;1, > 13

EJK 15-OCT-74 11:48 31169

User-progs that seem to be working as of now.

(J31169) 15-OCT-74 11:48;;;; Title: Author(s): Edmund J. Kennedy/EJK; Distribution: /RJC([ACTION]) DLS([ACTION]) TFL([ACTION]) JPC([ACTION]) EJK([INFO-ONLY]) ; Sub-Collections: RADC; Clerk: EJK;

RJC 15-OCT-74 13:00 31170

Items for Newsbrief

(October)

Promotions

Gains

Reassignments

Losses

***Honors and Awards ***

Briefings and Tours

Of General Interest

Publications

Contractor

In-house

RJC 15-OCT-74 13:00 31170

Items for Newsbrief

(J31170) 15-OCT-74 13:00; Title: Author(s): Roberta J. Carrier/RJC;
Distribution: /DRL2; Sub-Collections: NIC; Clerk: RJC;
Origin: <CARRIER>ISNEWSBRIEF.NLS;1, 9-OCT-74 07:49 RBP ;