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Selection of Wang Word Processing Equipment for the Department of Conference Services' English/French/Spanish Stenographic Pools

The following recommendations for the selection of Wang word processing equipment are excerpted from a study prepared for the Department of Conference Services by staff of the EDP and Information Systems Service.

1. In view of the recommendation of the ACABQ and Fifth Committee during the thirty-second session of the General Assembly that the Department of Conference Services (DCS) proceed in 1978 with the first phase (first year) of its proposed programme of technological innovations in the production of publications and documentation in the United Nations, we have outlined in the following paragraphs our recommendations concerning the word processing equipment you should consider for this purpose as well as our reasons for the selection. Based on these reasons, we have no hesitation in recommending that the equipment to be utilized for the first year of operation in the English, Spanish and French Typing Pools and the Correspondence Unit should be the Wang System 30 Word Processing Equipment.

2. The configuration of equipment, its capacity requirements and the operating characteristics used in the review of various word processing systems were based on the recommendations contained in the report of the consultants, Arthur D. Little, Inc. These specifications were reviewed against the systems provided by eleven suppliers, namely: Vydec, Wang Laboratories, Micom-Beta, Digital Equipment Company (DEC), Daconics, Avionics, Burroughs-Redactron, IBM-Office Products Division, Lanier, Addressograph-Multigraph and Xerox.

3. The review included meetings with representatives of suppliers to explain each requirement as indicated in Annex 1, and to determine their systems' characteristics for each of the various specifications listed in Annex 2. Demonstrations of the equipment were also attended, in company with representatives of DCS, for those systems which showed promise. In addition, a Vydec - Model 1400, a Wang - Model 10A and a Lanier machine were installed in the New York Computing Centre (NYCC) for testing and use by the Accounts Division and EDPIS. A Burroughs-Redactron was also installed in the Treasury Division and subsequently replaced by Lanier due to the latter's greater capability for Treasury functions. A Wang - Model 20 with two work stations was also installed in the Spanish Typing Pool to pilot test the trilingual, wide screen and general technological workability in the DCS environment.

4. Of the eleven suppliers considered, only three could be considered for final selection. The others were disqualified or withdrew for the following reasons: a) inability to meet the trilingual requirements; b) a purchase-only policy; c) inability to meet other mandatory requirements; d) inability to provide a satisfactory mix of equipment; e) excessive operating difficulties.

5. The three remaining suppliers, namely, Vydec, Micom-Beta and Wang Laboratories, provided proposals for equipment which appeared to meet the major requirements for DCS. The differences in the variety of functions and operations are shown in Annex 3. An examination of Annex 3 reveals that:

(a) The Vydec equipment is less suited to a considerable extent for the work of DCS than that provided by either of Wang Laboratories or Micom-Beta for a variety of reasons . The more important of these is that the system is page rather than document-oriented which, coupled with the lack of automatic indexing, will create numerous procedural problems for the supervisory personnel of the typing pools. It is possible that a document of several pages may not have each page stored on consecutive tracks on the diskette thus creating additional book-keeping problems for supervisors when assigning revision work. If the operator should fail to note the requisite indexing and identifying information correctly or not at all, finding the appropriate pages for revision will be more time-consuming than retyping the page. In addition, if individual operators typing different pages of the same document should fail to note tab settings and margins on each page, a great deal of time could be lost adjusting all pages to the same settings. These problems are handled in an automatic fashion by Wang and Micom-Beta.

(b) Vydec, being a stand-alone system, creates a procedural problem because of the time lapse between production of draft and receipt of revisions from translators and the need for great flexibility in making work assignments. Each portion of a document done by a different operator will need to be stored on a separate diskette resulting in a proliferation of partially-filled diskettes and a concomitant location and indexing problem. The Micom-Beta equipment, although document-oriented, is also a stand-alone system and will thus create the same problem. On the other hand, the Wang equipment, System 30, being both document-oriented and shared processing/storage minimizes this problem.

(c) Vydec does not provide automatically any work statistics nor a history of the revisions made to any particular document. The burden of this task is left to the operator and supervisors to complete manually. This also creates an additional task for supervisors to keep track of which version of a document or page is stored and on which diskette. The same problem affects the Micom-Beta system but not the Wang equipment because it is fully automatic in this respect.

(d) Vydec provides printers which are completely stand-alone from the work stations. Consequently, when printing is required, operators must take diskettes to the printers. This can result in a queueing of operators and an interruption in the typing of the next document. The alternative is to provide an additional staff member for each printer. This problem also affects the Micom-Beta system although to a lesser extent in that their printers are not completely stand-alone. This Company, to reduce its costs to an acceptable level, proposed that one-third of their work stations be equipped with printers attached and the remaining two-thirds sharing these printers in much the same fashion as Vydec, although there would be an additional operator interruption. Insofar as the Wang system is concerned, this problem does not arise being a shared logic/processing system and queueing is done automatically by documents and not by the staff.

(e) Vydec and Micom-Beta, being stand-alone systems, cannot provide, except at excessive cost, the capability of permitting each work station to communicate with the central or host computer and consequently with each other. To overcome this problem to some extent, they have suggested that two work stations only in each typing pool be so equipped. This approach creates the same queueing and interruption problems indicated in (d) above. The Wang System 30, being a shared logic/processing system, while also requiring two communications systems in each typing pool, permits any work station to communicate automatically through its CPU.

(f) There are four basic operations or functions to be performed by the word processing systems, (i) typing or keyboarding, (ii) printing a page or document, (iii) storing pages or documents on archival diskettes, and (iv) communications with the host computer. The Vydec system can only do two of these functions simultaneously, Micom-Beta can do three and Wang all four. Thus the queueing and interruption problems mentioned previously will be further magnified for both Vydec and Micom-Beta. In addition, unlike Wang, communications between work stations cannot be accomplished except through the transfer of diskettes and related manual operations.

(g) The Vydec system is hardware-oriented and thus changes in requirements over time cannot be accomplished except through time-consuming and expensive engineering alterations. Micom-Beta and Wang are both software-oriented and thus improvements and changes can be more readily accommodated as they are developed. In addition, these software improvements are normally made readily available by the suppliers.

6. The Wang Laboratories, among the eleven types of sytems reviewed, is the only supplier which can provide a range of compatible levels of equipment, i.e., (a) System 10A which is a stand-alone system competitive in price with Vydec and Micom-Beta, (b) System 20 which is a shared logic/processing system for up to six operations, i.e., four work stations and two printers, to lower the average cost per work station through sharing a CPU, printers, and communications, and (c) System 30 to further lower the average cost of a work station through sharing a CPU, large disk storage facilities, printers and communications, i.e., up to fourteen operations can be accomplished such as nine work stations, four printers and one communications capability. Thus, if the growth in workload should exceed the capacity of a System 30, a fully compatible System 10A can be installed and progressively updated to the Systems 20 and 30 to lower the cost per work station with little to no changes in operating procedures. In other words, their equipment is upward and downward compatible and functionally equivalent throughout the range, and at the present time they appear to be unique in this respect.

7. As a result of the reasons outlined in paragraphs 5 and 6 above, it is recommended that the Wang Laboratories System 30 word processing systems be installed by DCS for its first year of operation. EDPIS will continue its review of the state of word processing technology and, if there should be further significant changes and improvements over the next year, we will bring these improvements to your attention for consideration.

Desirable Operating Characteristics of Word Processing Systems

Editing Capabilities

1) Retrieval — Pages that have been keystroked previously are stored in the system and can be retrieved and displayed in their original form on the visual display of the terminal a full page at a time.

2) Browse — All pages of a document can be displayed sequentially on the screen, in descending or ascending order.

3) Move — The ability to "pick-up" a word, line, a sentence, a paragraph or any other section of the text and move it in its entirety to any other location in the text.

4) Delete — The ability to delete characters, words, lines, sentences or paragraphs in the text and "close" the remaining text after deletion.

5) Insert — The ability to insert new text, be it one character, one word, a sentence, or a whole paragraph, or any other portion of text from either the keyboard or stored text, and to "close" the text after the insertion is completed.

6) Search — The ability to search the text of a document to locate the occurrence of a particular word or block of text.

7) Search and alter — The ability to search the entire text of a document for every occurrence of a certain word or block of text, and to replace it in each instance with another word or block of text.

8) Boilerplate Insertion — The ability to direct the system to recall paragraphs or blocks of standard text and insert them in the document.

9) Headers and Trailers Insertion -- The ability to automatically place repetitive blocks of text (such as titles, document numbers, etc.) in predetermined locations on each page.

10) Dictionary — The ability to use a dictionary of prestored abbreviations and the complete names of what they stand for so that the latter would automatically replace the former in the text.

11) Underlining.

12) Centering.

Ease and Efficiency of Operation

13) The capability of typing out one page while the operator is entering or editing other text (in the same or a different document).

14) The ability to queue requests for output to the printer such that is will not interfere with keyboarding.

15) Ease of operation by the typist - flexibility of commands, layout of keyboard, legibility of display, training time required, special codes and instructions. etc.

16) Automatic wrap-around - at the end of a line, the text automatically 'wraps around' to the next line while the typist continues typing.

17) Capacity to store 20,000 pages at any time.

18) Ability of systems to communicate with each other to avoid retyping of common data, e.g. statistical tables.

19) A document directory facility containing such information of each document as title, creation date, current number of pages, current status (draft, revision, final), completion date, etc.

20) A communications facility which allows for linkages to the NYCC computer for additional storage capacity at a future date.

21) Visual (CRT) display terminals capable of displaying the normal contents of an 8 1/2" x 11" page.

22) Ease of entering and editing statistical and tabular material.

23) Ease of formatting two-column text, of up to 92 lines each and up to 60 characters per column, with one-half inch between columns. In addition, the capability of inserting and centering text or tabular material across the two columns.

Language Facilities

24) The ability to enter, display and type English, French and Spanish text material.

25) Provision for the insertion of special characters for mathematical, statistical, technical papers, e.g., Greek characters.

26) Availability of both the English tri-lingual and French tri-lingual keyboards with the capability of easy interchange. Sample attached.

27) Hard copy output devices should have courier-style typing elements for the English, French and Spanish languages.

Output Capabilities

28) Automatic hyphenation.

29) Automatic right justification.

30) Automatic pagination.

31) Proportional spacing.

32) Proportionally spaced characters.

33) Columnar format for printing.

34) Ability to produce pages of various sizes -- 12" x 17" as a minimum.

35) Vertical line space control up to triple space - including a half-space capability for footnotes and a capability for subscripting and superscripting.

36) Print platten with capability of using single sheet or continuous roll pinfeed at 6 lines to the inch.

37) Multi-part forms capability.

38) Ability to recognize a stop signal to skip printing of certain portions of text.

39) Ability to print specific portions of document.

40) Ability to interrupt printing of document.

Comparison of Operating Characteristics of Various Word Processing Systems as at 12 December 1977

	Functions	Vydec	Wang	Micom-Beta
1.	Retrieve for display - Full pages (84 character lines min.)	Yes	No 1/	No 2/
2.	Browse	No	Yes	Yes
3.	Move	Clumsy 3/	Yes	Yes
4.	Delete	Yes	Yes	Yes
5.	Insert	Yes	Yes	Yes
6.	Search	No	Yes	Yes
7.	Search and alter	Semi-auto	Yes	Yes
	Boilerplate Insertion	Yes	Yes	Yes
9.	Headers and Trailers Insertion	Semi-auto	Semi-auto	Semi-auto
10.	Dictionary or Glossary	Not demonstrated	Yes	Yes
11.	Underlining	Yes 4/	Yes	Yes
12.	Centering	Manual	Yes	Yes
13.	Typing output while Input/Edit/Other	Page only	Yes	Yes
14.	Queue output requests while keyboarding	Manual	Yes	Manual 5/
15.	Ease of operation by typists	Adequate	Good	Good
16	Automatic wrap-around	Limited to one position only 6/	Yes	Yes
17.	Capacity to store 20,000 pages	333 Floppy disks	One sealed disk (2443 pages) and 241 floppy disks	333 Floppy disks

	Functions	Vydec	Wang	Micom-Beta
18.	Ability to communicate between systems	Yes 7/	Yes 7/	Yes 7/
19.	Document directory index	Manual	Yes	Yes
20.	Communicate with NYCC computer	Yes 8/	Yes 8/	Yes 8/
21.	Ease of enter/edit statistics and tables	Good	Good	Good
22.	Ease of formatting required two-column text	Acceptable	Good	Good
23.	Trilingual capability	Yes	Yes	Yes
24.	Print Greek and other characters	Yes 9/	Yes 9/	Yes 9/
25.	Availability of English/French trilingual keyboards	Yes	Yes	Yes
26.	Courier type fonts	Yes	Yes	Yes
27.	Automatic hyphenation	Semi-auto	Semi-auto and auto.	Semi-auto and auto.
28.	Automatic right justification	Yes	Yes	Yes
29.	Automatic pagination	autoprint 10/	Yes	Yes
30.	Proportional spacing	Yes	Yes	Yes
31.	Proportionally-spaced characters	No inter-character used	No	No
32.	Printing of two-column formats	Yes	Yes	Yes
33.	Print pages of different sizes (min. 12" x 17")	Yes	Yes	Yes
34.	Line spacing up to triple - including half-space for footnotes and super/sub-script capability	Yes	Yes	Yes
35	\bility to mix spacing on a page	Manual	Easy	Easy
36.	Tractor Head/Single sheet-6 lines per inch	Yes	Yes	Yes
37.	Multi-part forms capability	Yes	Yes	Yes

	Functions	Vydec	Wang	Micom-Beta
38.	Stop for skip printing as needed	Yes	Yes	Yes
39.	Print selected portions of text	Manual selection	Full pages only	Yes
40.	Interrupt printing	Yes	Yes	Yes
41.	Rent	Yes	Yes	Yes
42.	Operational statistics	Manual	auto	Manual

1/ Four CRT displays required to see entire page but simple to accomplish through one-key stroke.

2/ Page viewed through continuous scrolling up or down and stopping at appropriate point through one key.

3/ Requires 11 separate steps which are clumsy and time consuming versus 5 simple steps in the others.

4/ Printing only, and is indicated on CRT through brightening affected characters.

5/ Manual for two work stations out of three.

6/ The position is the 92nd character and DCS standard is 84th character. Therefore, for all practicable purposes, the answer should be no for this purpose and must, like ordinary typewriter, hit a return key at end of every line.

7/ With floppy disks, and bisynchronous at considerable extra costs for Vydec and Micom-Beta as they are stand a lone systems. Wang provides this at no extra cost above that required to communicate with the NYCC.

8/ In all three cases, there may be some limitations. In addition, only Wang can provide communications from all work stations (any time at a time per CPU). Vydec and Micom-Beta, being stand a lone systems, are limited to two such stations (out of eighteen) in each Typing Pool due to excessive costs to permit all stations to have this facility.

9/ Will require purchase of printwheels and special procedures.

10/ At extra cost as an option