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8 July 1958

INTELLIGENCE ADVISORY COMMITTEE

MEMORANDUM FOR: IAC Committee on Documentation

SUBJECT : Visit to Computer Controls, AVCO and ITEK

The attached memorandum is circulated for your information
by direction of the Chairman.


Secretary

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Attachment
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2 July 1958

MEMORANDUM FOR: Assistant Director, Central Reference

SUBJECT : Visit to Computer Controls, AVCO and ITEK

On 1 July 1958, in company with [] and []
I visited subject companies in Boston.

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1. We detrained at Route 128 Station and were met by Mr. Ben Kessel of Computer Controls. After breakfast we went to CC which is located in Babson Park, Wellesley, Mass. We strolled through the plant looking at the manufacturing process for the transistorized units to be used in electronic gear and especially the MINICARD selector for OCR. The miniaturization of this unit has reduced its size from 6 x 8 feet to 4 x 6 feet, its unit power requirement from 120 watts to 3-4 watts, its air conditioning requirement to nil, and its maintenance problem virtually to minimum. At the same time its selection logic has been materially increased. A briefing by members of the staff on the Air Force Document Data Index device followed. The Document Data Index Set AN/GSQ-26 is a flexible, high speed information storage retrieval system. The information storage medium is magnetic tape. Each reel of magnetic tape can contain up to 35 million bits of stored information. The stored information can be searched at the rate of over 180,000 bits per second to seek the answers to as many as ten questions simultaneously. Each of the ten questions can be composed of any combination of fifteen phrases. Each phrase can be made up of any combination of twenty question words. Its designed characteristics are:

- a. The memory unit is 1 inch magnetic tape with 2 alpha-numeric characters, 2 parity bits and 1 timing bit across the width of the tape. The packing density is 220 pulses per inch. The tape is scanned in either direction at 110 inches per second or an entire reel in $\frac{1}{2}$ minutes.
- b. An average document of 20 words, of 7 characters per word, appears to consist of document number and such other descriptives as the Air Force desires.
- c. The tape is set up in blocks averaging 7.3 documents per block or a block length of 2.66 inches plus 0.4 inches of gap. This gap permits the tape to be stopped between blocks when a hit is made. About

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260 documents per second are scanned, and there are about 68,500 documents per reel.

- d. The first operational mode is the input from punched paper type to magnetic tape. The paper tape is read into a core buffer until 1092 characters have been so stored then the buffer dumps onto the magnetic tape. The input rate is 200 characters per second or 1.3 documents per second or 300 documents in $3\frac{1}{2}$ minutes.
- e. Question words are inserted into the high speed internal memory of the machine by means of punched paper tape. Logical assembly of the words into phrases and of the phrases into questions is specified by means of plug-board connections. The plugboard provides for specifications of equality, "greater-than", or "less-than" comparisons between stored and question words, and also makes both assertions and negations of words and phrase comparisons available for incorporation into logical statements of the phrases and questions.
- f. Selected documents may have 3 words printed out, one of which must be the document number. Again the hits are registered in the core memory and printed out on a teletype receiver or a paper tape is made and fed to a Flexowriter.
- g. An editing capability is being designed into the machine so that documents may be erased, however this process looks unproductive and uneconomical.

In short, the machine is a mechanized index to a large document file. I believe we should keep close watch on the development of this device for possible utility with proven MINICARD gear (camera, processor, etc.) as an index to a MINICARD file.

2. We went next to AVCO where Messrs. Martin and Phaneuf described and showed us a model of their idea for document storage. In essence the idea is:

- a. Photographs of documents are stored at 100x minification on glass panels, 10,000 pages per panel.
- b. An optical-electronic readout displays the document on a TV tube. Under present operating practice, the document

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could be read only with great difficulty owing to a one second sweep down the tube. Resolution at all points on the tube is good.

- c. Specific documents would be located by plate number and x and y coordinates.

We were all impressed with the tube Goldbergish aspect of the device, and the probable maintenance problems with so many delicately adjusted electronic components which would have to move quickly and stop suddenly. In short, we thought the idea interesting but in its present operational attitude impractical.

3. Our third visit was to ITEK where Dr. Art Tyler gave us a tour of the optical laboratories in town; then we went out to the plant. The most interesting development in town was an aerial camera capable of sweeping an arc of 120° in minimum time, and an 8x enlarger which created a strip print of the sweep. At the plant we saw a high fidelity viewer and scanner for aerial photographic transparencies. Later we met with Dick Leghorn to discuss ITEK's future plans. They propose to join the throng in the information processing field and possibly in mechanical translation. One subject in the former field of interest was the mechanical definition of questions, i.e., a means to assist the information service to define precisely what its customers want. I mentioned character reading as being of great interest in several applications. Dick Leghorn commented that the pendulum seems to be swinging away from image and coding storage on the same medium, but rather toward separate index for subject or area searching and storage of the images. The advantages seem to lie in file management.

4. Our formal meetings broke up a few minutes after 1800 hours, but Art Tyler joined us for dinner at the Red Coach Inn for more philosophizing on the subjects of the day.


Deputy Assistant Director
Central Reference

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