For Release:

IMMEDIATE

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Computer Applications Area

Directly on axis with the pentagon theaters is the Computer Applications Area, where demonstrations of two computer accomplishments -- recognition of handwritten characters and machine language translation -- are given.

Character Recognition:

A tiny beam of light, somewhat like the "blip" on a radar screen, traces the outline of handwritten numbers, and identifies them in a system that International Business Machines Corporation is demonstrating at its New York World's Fair Pavilion.

The system reads a date written on a card by visitors (5/22/1927, for example) and retrieves a featured headline published by The New York Times for that date. The period covered runs from the present as far back as its first issue, September 18, 1851.

A wide variety of individual writing styles is acceptable to the optical scanning device, although excessive flourishes and gross distortions in writing cannot be read.

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The card bearing the handwritten date is placed in the optical scanner. This machine makes use of a curve follower character recognition technique. The tiny scanning beam follows the contours of each number, traveling a circular path in much the same way that a grade school student makes continuous circles for his penmanship exercises.

Electronic circuits in the optical scanner record the scanning beam's route around the edge of each character. Based on a pattern created by the beam's direction, the numeral is identified. In some cases, such as the handwritten 0's and 8's, the beam explores the inside of the character to make the final identification.

Information about the recognized number is transmitted automatically from the optical scanner to an IBM 1460 data processing system. Nearly 40,000 headlines from The Times are stored in the system. A headline from each day's paper is added to the file every morning.

After it has been identified in the computer, the headline is flashed on an overhead display unit and a souvenir copy is printed on an IBM card for the visitor.

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In the case of the 5/22/1927 example, this headline would appear: MAY 22, 1927: LINDBERGH DOES IT - 3,000 MILE FLIGHT TO PARIS IN 33 1/2 HRS. FRENCH CROWDS CHEER.

This demonstration of handwriting recognition technology is important because it illustrates the progress being made in finding better ways to enter data into computers. Preparing information for the computer through manual keying is the slowest step today in data processing. Machines that can "read" information as originally recorded are needed to help reduce the time and cost now required to get this information from the people who create it to the high-speed computers that process it.

Language Translation:

IBM's demonstration of automatic language translation at the New York World's Fair is designed to show the effectiveness of machine translations today -- and also to show how a computer can be used effectively by people many miles away from the machine itself.

The language translation is from Russian to English. The matter to be translated is transmitted over telephone lines from two IBM 1050 data communications systems in a company plant at Kingston, N.Y. The completed translation is sent back to the pavilion by the same method.

At the pavilion, a typist seated at a printer keyboard copies sentences from Russian technical reports. The typist does not understand Russian, but has learned to recognize letters of the Russian alphabet. As each Russian sentence is typed, it is instantly transmitted over the telephone lines via the IBM Teleprocessing equipment to the computer in Kingston, 90 miles from the World's Fair site.

The computer is linked to a "memory" disk that contains the coded meanings of 200,000 Russian words. The disk looks like a transparent phonograph record, and contains coded words and phrases in Russian, together with their English meanings. The words are photographically recorded in circular tracks on one side of the disk. The code for each word consists of a sequence of black rectangles of microscopic size.

A light beam searches the disk until it matches each word or phrase in the sentence with the coded equivalent of that word or phrase on the "dictionary" disk. When a perfect match is made for each word in the sentence, the light beam instantly relays the English translation and pertinent grammatical information back to the computer. The computer follows the rules stored in its own memory, clarifies meanings, and in some cases inserts prepositions, articles and auxiliary verbs so that the translation will conform more closely to English grammar instead of the Russian.

The final English translation is then transmitted back to the World's Fair site, where it is printed on an automatic typewriter.

All this happens at remarkable speed. When the typist feeds an average Russian sentence of about 15 words into the computer, the machine translates the entire sentence in one to two seconds. Then it takes about 6 seconds for the computer to print out the translation on an automatic typewriter.

In one minute, the computer is capable of translating 1500 words, or about five pages, of complex technical material from Russian to English. When a high-speed IBM printer is used, this 5-page translation can be printed in about 20 seconds.

Today in an age of rapid scientific discoveries, human translators cannot keep up with the flood of technical information being produced in French, German, Russian, Chinese and other languages.

There is a pressing need for scientists to keep up with the works of their colleagues and human translators cannot be trained fast enough or in sufficient numbers to make more than a dent in the billions of words in many languages each year. A practical solution to this problem is the development of a system of rapid, automatic translation of languages by machine.

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