Automatic Data Processing

Paper Submitted by Canada

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## Background

The world-wide trend toward computor processing of all forms of mass data is having its impact on the recording, storing, manipulation and publication of geographical names.

This impact is naturally most pronounced in those countries which have developed or are employing sophisticated electronic equipment for data processing. Applications have generally been in areas related to mathematics, statistics and inventories, where enormous volumes of data are involved. Printouts have usually been in upper case block letters, lacking typographic refinements. Despite this latter limitation which is a handicap in the adequate representation of lists of toponyms, some countries have employed this computor print-out for gazetteers.

### Canadian Experience

The Canadian Permanent Committee on Geographical Names has been watching the progress of computor applications for some years. Careful assessments have been made of the potential advantages of data banks. Until recently it was felt that the large costs incurred in constructing a data bank of geographic names was scarcely justified for the sole purpose of producing gazetteers, nor was it considered that print-outs in block capitals were satisfactory for publication, since diacriticals would be absent, and other typographical refinements were lacking.

This situation has now changed. Automated cartography in Canada has progressed to the point where a computor bank of names for automated type-placement is an additional demand on a storage memory facility should it be developed.

A second, and more significant development is the creation of a new kind of computor print-out by a Canadian data processing firm. The new

method incorporates a third generation electronic dot memory photo-typesetter in a computor system. This facility produces type in virtually any type face, point size, spacing and formatting the customer may require. This type meets the highest standards of the graphic arts.

Material inputs to the system through consoles similar to electric typewriters. Terminals are placed in customer offices, and are linked to the computor central by telephone lines. Terminal operators, if good typists, can be trained to operate consoles in a few days. The firm helps in training and in constructing programs. A terminal rents for about $1,200 per month on a ten hour shift basis. Half shift rentals are possible. Input material can be returned at the console as hard copy at 150 words per minute for checking. Any type of amendment can be made instantly. The day a job is completed, hard copy, completely formatted, exhibiting all typograph requirements programmed, including, as desired, any type face specified, upper and lower case, roman and italic styles, varigated line spacing, perfect left and right mariginal line justification, paragraphing, indentation, heading placement and open spaces for illustrations. Page form is presented, ready for photography, plating and printing.

These specifications meet all possible typographic requirements for high quality gazetteer presentation.

During the process memory storage is created on disk or magnetic tape as specified. The electronic typesetter operates at 6,000 characters per minute. Final high speed print-outs are produced at about 1,200 words per minute.

In addition to a considerable saving in elapsed time to photo ready stage over previous methods used by the Canadian Permanent Committee, preliminary cost analyses indicate a cost saving of about 40%, based on an actual gazetteer situation.

The Committee plans that its first gazetteer will be produced by this method this summer.

## Digitizing

Experimentation is also in progress to achieve a method of securing the geographic co-ordinates for the names presented in the gazetteers faster than the slow manual methods used hereto for. The supplementary use of the co-ordinates in the data storage bank for automated cartography demand co-ordinates in values of degrees, minutes and seconds. Canadian gazetteers have shown only degrees and minutes. Establishing accuracies to seconds from even large scale maps is impossible inpractical terms.

The solution being explored is the use of a digitizer combined with a sensing head. The method involves the simple and rapid marking of the points for which values are required on a map, the typing of each name on the digitizer console, the positioning of the sensor head over the position

marked for this name, and the pressing of a button.  A print-out gives
the names and the positions to whatever degree of refinement programmed.
Costs are much less than manual methods.

The combination of the two systems mentioned in this paper can
therefore serve both gazetteer production and automated cartography
computably.

It should be noted that the co-ordinate refinements to seconds, while
stored for the purposes of automated cartography, are not considered
necessary in Canadian gazetteers.  These publications will show latitude
and longitude values only to the nearest minute as before.

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