

**MINISIS USERS' GROUP
MEETING 1991**

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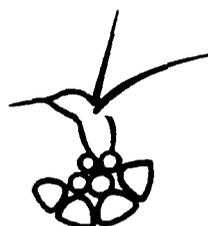
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Esta serie incluye ponencias de reuniones, informes internos y documentos técnicos que pueden posteriormente conformar la base de una publicación formal. El informe recibe distribución limitada entre una audiencia altamente especializada.

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Table of Contents

MINISIS: Future Directions Martha Stone	1
MINISIS Version H Terry Gavin	7
MINISIS Integrated Library System Overview Bob McKercher	11
MINISIS Version H, Technical Information Richard Lee	17
The Application Specification Toolbox Richard Lee	71
Bilingual Thesauri and Indexing Anne Barkworth and Sylvain Lemieux	117
An automated circulation system for CDS/ISIS Ron Davies	145
L'utilisation de MINISIS à l'Assemblée Populaire Nationale Algérienne TALEB Seddik	147
Opening "Windows" on MINISIS Virginia Ballance	151
Moving data from MINISIS to Desktop for Publishing WandaJane Phillips	157
Roundtable - Menu Drivers/Online Assistance Programs Mr. Witold Merkis	159
La formation sur MINISIS en Afrique Noire KAMENI Dieudonné	163

The Applications of Optical Disc Technology at Pao Sui-Loong Library of Shanghai Jiao Tong University in China Zheng Qiao-Ying and Yang Zong-Ying	169
PAHO/BIREME CD-ROM Retrieval Interface Abel L. Packer, Ricardo Piva, Adalberto O. Tardelli, Elenice de Castro, Marcia Y. Barreto, and Roberto S. Pereira	175
The Canadian Provinces Database: MINISIS and CDS/ISIS Ruta Wittaker and Alan Welch	181
Transferencia de dBase a MINISIS Mario Jimenez	193
Integrated Database Implementing the CCF on CDS/ISIS Alan Hopkinson	195
UNFLATTEN A tool every MINISIS database manager is looking for. Peter van Boheemen	201
MEDLINE under MINISIS Abel L. Packer, Adalberto O. Tardelli, and Marcia y. Barretto	205
Managing Change: The case of using MINISIS at S.N.D.T. Women's University Library, Bombay, India MKR Naidu	211
Library automation at JNU using MINISIS software A.K. Anand and T. Viswanadham	215
El Manejo de la Información de la Exploración Petrolera en la Empresa Colombiana de Petróleos - ECOPEPETROL. Ing. José Rafael Ortiz O.	229
Descripcion del Sistema Automatizado el la REPIDISCA Rosa Siles	255
Republica de Columbia Departamento Administrativo del Servicio Civil Jairo Ivan Roa Bedoya	263
MINISIS System Management Richard Palmer	271

On-line Document Delivery using MINISIS Marcia Y. Barretto and Abel L. Packer	293
IMF Fund Accounting System Susan Turner and John Nesbitt	303
Centro de Recursos de MINISIS para América Latina Enrique Barreto Pastrana	309
The Establishment of MUG Malaysia and The Role of AFHB, a Member of MUG Malaysia Razali Hj Sirat	317
New Progress in the Application of MINISIS in China Jiang Xiangdong and Ju Changao	325
Authors	

Opening "Windows" on MINISIS

Virginia Ballance

Introduction

The Multilingual Bibloservice (MBS) of the National Library has been a MINISIS user since 1987. Our application is fairly simple in library terms: we use MINISIS for cataloguing, acquisitions, producing various products (such as labels, cards, works sheets, catalogues, lists, etc.) and to control the circulation of our collection of over 40,000 books. We also allow users from outside our library to dial in to the data base to search for cataloguing copy or for interlibrary loan locations and we will soon be implementing a serials check-in module.

During the past year, MBS and the Metropolitan Toronto Reference Library (also a MINISIS user) have cooperated on a research project to investigate the possibilities of using Microsoft Windows with MINISIS. The graphics capabilities of the package will allow many character sets (extended roman script, Arabic script, Indic scripts, etc.) to be entered, displayed, retrieved and stored in MINISIS data bases.

A multilingual library service

Our library is unique in that the materials we collect are in neither English nor French (Canada's two official languages) but in 32 different languages - what we call "heritage languages" in Canada. In order to catalogue and circulate items, print catalogues etc., we must be able to enter, display and output roman alphabet letters with a I the various accents and special letter combinations needed, or be able to work in non-roman script alphabets, such as Arabic, Hindi, Chinese, Greek or Russian.

MBS chose to automate using MINISIS because it was the only system available with the capability of storing data in languages other than English and roman as well as non-roman scripts. Also, it was a Canadian-developed software, easy to use, not too expensive, and so on.

Automating the MBS collection

Automating the many language collections at MBS was achieved in phases. First, the easier, more numerous roman-script languages were automated - about 22 languages in all. In the next phase, the Cyrillic and Greek collections were automated. The preliminary phases of extended-roman script and non-roman script development were achieved using MINISIS terminal handlers and special terminals that allow user-defined character sets. Basically, these handlers "trick" the terminal into displaying the characters you wish to see. The drawbacks to this solution are very simple: for one, the terminals are no longer being made and, secondly, we are still within the constraints of a 256 character ASCII table. Although the table has 2 spaces, in reality there are only 91 spare spaces available for user-defined characters on the special terminal.

For the past few years, MBS has been looking for a solution for automating the remaining, non-roman, and more importantly, the non-conformable character sets. The original conception of a multilingual, multiscript system was that "one terminal", probably a microcomputer workstation, could be used for all languages and scripts. After three years of working with MINISIS, we have come upon a new, exciting solution to our problem of automating non-roman scripts.

The "graphics" solution for non-roman scripts

Given the limitations inherent in the present situation for automating roman and non-roman scripts, MBS began seeking a solution to automating all character sets in our collections (we have 10 non-roman languages, representing 8 character sets) on MINISIS. In 1988, there were several multiscript word processing packages on the

market - you may be familiar with Multilingual Scholar or the fonts available on the Macintosh.

Our MINISIS suppliers, McLeod-Bishop Systems, investigated using the Macintosh as a front-end to MINISIS, sending the data down to the HP. Display, entry and print would be handled on the Macintosh, using the character sets (which are basically graphics) that have been developed for the Macintosh. An article describing this solution appeared in *Interact* magazine.

The expectations of this development were unmet in the end because it was not possible to transmit graphics characters from the Mac to the HP 3000 since the communications package was not able to handle larger than normal format characters. It was concluded that although the idea was sound, we were just a little ahead of the technology.

The Arabic Automation Study

In 1989, MBS contracted with Brant Computer Systems (the successor to McLeod-Bishop Systems) to investigate what would be required to automate both the Arabic and Urdu collections, about 8,000 titles in all.

Brant discovered that it would be much more difficult than we initially anticipated. Arabic computer terminals were not available in Canada and would have to be imported; if terminals were imported, then HP would not guarantee it could pass CSA standards nor would they agree to support it. As well, the Arabic terminals would display only the Arabic script and unaccented roman-script characters. MBS needed the accents for French and Arabic in romanization in addition to English and Arabic. And, we had hoped to expand the character set to include languages using a similar script, such as Urdu and Persian. Since the character set is

permanently Fixed on the HP Arabic terminals, this solution was ruled out.

Back to the drawing board!

By the Spring of 1990, technology had caught up to our needs. Microsoft had finally released its Windows Version 3.0 software on the market and Marc Bednar, from Brant Computer Services, had the idea of using the Graphic User Interface (GUI) of Microsoft Windows for character set development.

The Windows 3.0 System Development Kit (SDK) allows applications developers to write programs that will take advantage of the GUI. Among the tools provided by the Font Editor, a powerful tool that allows the user to custom design characters for display on the computer's monitor, making them bigger, darker, etc. An 80 characters per line standard was adopted, using fixed rather than proportional fonts, because it would be more practical for print formats.

Given that Windows operates in "graphics mode", there are no limitations on the number of character sets that may be displayed simultaneously. Windows allows the display of as many character sets as will on one monitor screen. This is a must for MBS because records contain as many as four different character sets, for example, Arabic, English, French and romanized Arabic. With the use of the MINISIS CSIC codes, the system will be able to "auto-discriminate" between the character sets, thus eliminating the need to switch manually between character sets as is presently done.

The Windows 3.0 application that was demonstrated during the presentation is still undergoing development and is therefore incomplete. We are currently able to demonstrate

entry, modification, retrieval and display of the characters used in MBS roman script languages. As well, an incomplete version of the Arabic character set was demonstrated. All, a working prototype of three character sets: the HP default, roman script and Arabic was demonstrated. The fonts correspond to 150 standards where they exist.

Development process

The first step in developing the Windows 3.0 application was to establish communication between the HP 3000 and MINISIS. This was achieved by using a series of Windows functions which give access to serial communication. Once the possibility of communication was confirmed, a Windows character set handler was developed for each language. It is important not to confuse Windows character set handlers with traditional MINISIS terminal handlers. The Windows character set handlers do not use MINISIS terminal handlers in order to display non-standard characters.

The programs have been structured in such a way that the Windows character set handlers have been developed separately from the main application. This eliminates the need to change the main application in order to add new languages.

Roman-script character set handler description

All of the roman-script languages are based on the same internal Windows character set. Each letter is defined apart from the diacritic. This means that to Windows (and subsequently to MINISIS) an "e acute" (é) is stored as two characters: first the

diacritic, then the letter. The graphic capability of Windows allows characters to be overlaid, giving the user the impression of seeing only one accented character.

The roman-script character set comprises of three different types of non-standard characters: composed characters, special letters and accented characters.

The composed characters are entered using the F2 keyboard function key. Once entered, the system waits for the next two characters to be typed. If the two characters are valid, the composed value is sent to MINISIS and consequently displayed on the PC's monitor. An example of such a character is the combination of the "a" and "e" characters which is composed into an

The special letters are entered using the F3 keyboard function key. These are characters which represent a letter that cannot be logically composed. After this key is pressed, the system waits for the next user input key to be entered. The combination of the F3 function key and the user input key generates the special character. An example of this character is the Polish "crossed I". This is the combination of the F3 function key and the "I" (in either upper or lower case).

The accented or diacritical characters are entered using the F4 keyboard function key. Once this key is pressed, the next user input key will be a reference to a diacritic that will be displayed on the monitor but will not be sent to MINISIS immediately. Instead, only when the next letter is entered will the letter be overlaid on top of the diacritic and then finally be sent to MINISIS as two characters. This gives the user the illusion of seeing only one accented character when in reality there are two separate characters.

The most useful aspect of the Windows 3.0 interface is that the system is not limited to 256 accent/letter

combinations. The user is now able to create numerous new accent/letter combinations, completely removing the limit on the total number of languages that can be entered on the database. Mistakes are easily corrected: a backspace automatically undoes the previous character, or in the case of the special characters, the previous two characters.

Non-roman scripts: the Arabic prototype

When entering a non-roman script, the data will be preceded by a MINISIS CSIC code and, on termination of the non-roman script, followed by another CSIC code. The default for the MBS application will be the roman-script character set; however, other users can define whatever default character set they may require.

For the purposes of the Windows research project, the Arabic character set was chosen as it presented several important problems: the alphabet runs from right to left, characters change their form depending on their position within the string, the letters are connected, and a field may contain data in both the roman and non-roman character set.

The prototype was able to demonstrate that Windows 3.0 can display data from right to left, accent characters that are joined and accept data in any script within the same record and field. As well, the system was designed to automatically perform "contextual analysis" during data entry. As each letter is displayed, its form will change depending upon its position within the string of characters. The characters will however, be stored in MINISIS data bases in their "isolated" forms and will have the same ASCII values of the ISO 8859-6 standard. Adhering to this standard will assure that any printer with an Arabic card will be capable of

producing Arabic output. The only drawback is that the system does not check that the characters are correctly placed within a string - for instance, some Arabic characters cannot be in the first position or final position (i.e. users are not protected from typographical errors!).

Conclusion

While the Windows-MINISIS interface is still in a developmental stage, it does appear to be a solution

to the problem of automating multiple non-roman scripts on MINISIS. The advantages of this interface are numerous. It presents a universal solution, one that is not hardware-specific but can be used with any microcomputer that runs Microsoft Windows. It is infinitely expandable: adding more roman alphabet languages, such as Turkish, Romanian, Albanian, or Slovenian would be a relatively simple matter. With the customizing font editor capability, it will be possible to create many new character sets in non-roman scripts, such as Hindi, Panjabi, Gujarati, Thai, Tamil, and hopefully Chinese, Japanese and Korean. And best of all, it has successfully demonstrated that Microsoft Windows can work with MINISIS.