

## Paperless Braille Devices

J.M. Gill

Warwick Research Unit for the Blind

Braille has not been superceded by other forms of non-visual media despite numerous predictions to the contrary. Although audio systems, such as the tape recorder, and aids with tactual or speech output play an important role in giving blind people access to information, braille is still supreme in its use for reference and technical material. Another important aspect is that a blind person can write braille without having to invest in expensive equipment.

However braille embossed on paper has a number of disadvantages - the principal one is bulk. Typically a braille book will occupy twenty times the volume of its equivalent in print. This provided the initial impetus for the development of systems for storing braille very compactly. Numerous systems have been tried including coding braille as dots on microfiche.

In such systems the braille is output on a transitory display such as an array of pins which can be raised to represent the braille characters. There have been severe technological problems in producing an inexpensive reliable display which is comfortable to read.

Recent developments have concentrated on adapting computer technology for the digital storage of braille on tape or disc. The first such system in routine use was developed in the Soviet Union as part of a communication system for the deaf-blind. The introduction of digital cassettes brought the prices down to a level where the devices could be considered for individual use. The decreasing cost of microprocessors has permitted the introduction of sophisticated searching and editing facilities.

All tape systems are slow for random access to information. Floppy discs have been used for a number of years in microcomputer systems to overcome this problem but, as yet, only one paperless braille system is marketed with disc storage. Access time is particularly critical for telephonists using a system for storing telephone numbers.

Most manufacturers offer interfaces for connecting to printers, so that the braille data can be produced in print. However all the present systems will only operate in this mode with uncontracted braille. Also word processing facilities (eg

automatic centering of headings, underlining, page numbering) are not provided as standard on any of the commercially available devices.

Therefore one can expect significant improvements in the coming months as new facilities are added which will make significant difference to the application of these devices as aids to employment. Many of these new facilities will take the form of separate modules.

The choice of a system is not simple since it will depend on the specific application. This article attempts to point out the main features of the systems which are commercially available in the UK (NB the Braillocord is not available in the UK). The technical specifications in this article are based on information provided by the manufacturers and have not been checked by the author.

Table Commercially available devices

	Brailink	Braillex - C	Braillex - D	Digicassette	Versabaille
Storage media	mini	C-60	disc	C-90	C-60
No. of drives	2	1	2	1	1
Tapes require preformatting					*
Max. no. of cells (in 000's)	150	720	230	1000	400
Need to turn over tape		*		*	*
No. of cells on display	48	32	32-40	20	20
No. of buffers	2	1	1	3	1
Total buffer size (bytes)	4000	4096	4096	4800	1000
Braille keyboard	*	*	*	*	*
Alphanumeric keyboard	*	extra	extra		
Search by chapter		*	*		*
Search by page	*	*	*		*
Search by paragraph		*	*		*
Search by string	*	*	*	*	*
Search by record number	*	*	*	*	*
Search by keyword		*	*	*	
Mean access time (secs)	47	120	2		16
Can record audio information		*		*	*
Variable audio speed control		*			*
Microphone included		*		*	*
RS 232-C interface	*	*	*	*	*
Max. baud rate	9600	9600	9600	2400	9600
Re-chargeable batteries				*	*
Time between charges (continuous use)				8	3
Operate from 240 volts, 50 Hz	*	*	*	*	*
Weight, kg	9	18	18	3	4
Basic price £ (incl VAT)		3450	3795	2967	3329
Price with interface (incl VAT)	5290	4945	5290	3956	3789
Installation and training	345	345	345	50	0
Delivery (weeks)	4	2	4		4
Warranty period (months)	12	6	6	12	12

