RESEARCH ON AIDS FOR THE BLIND IN THE UK

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ABSTRACT - The paper outlines current research on aids for the blind in the UK, and discusses some of the problems of converting prototypes to commercially available aids.

RESUME -

In Britain the emphasis on research on aids for the blind is on single-handicap totally blind persons either of school age or in employment. However of the estimated 200,000 people in the UK with vision less than 3/60 Snellen, about 80% are over retirement age, and about half have a significant second handicap.

The reasons for the inbalance of the allocation of resources are various but include the desire of some research workers to develop academically-interesting technological aids (possibly to be submitted for a university degree), as well as the relative ease of obtaining funding to develop novel aids for the 'blind elite'. Also this group is more articulate at expressing their unmet needs.

Aids can be grouped by the type of technology involved:

1. Special high technology aids
2. High technology aids relying on existing hardware
3. Medium technology aids
4. Simple aids

The first group includes new electronic mobility aids as well as electronic reading machines. Dr Heyes at Nottingham University has developed a spectacle-mounted ultrasonic mobility aid with binaural output. The audio signal indicates the presence of an

object within certain distances; the display is similar to the earlier Nottingham Obstacle Detector.

Mr Fowler at Bristol University has developed a reading aid which gives an enlarged tactual display of the character; this is similar in concept to the Optacon. The main differences between this device and the Optacon are the semi-automatic tracking of the reading head, and the display which is made up of a number of moveable studs mounted on a rotating disc (Fig 1). It is claimed that many blind people prefer this display to that used in the Optacon, but a disadvantage is the physical size of the equipment.

Fig 1 The prototype reading machine developed by Fowler.

A different approach to the design of a reading machine is that adopted by Prof Aleksander at Brunel University who has developed a reading machine with a hand-held camera, optical character recognition and synthetic speech output. He claims that his device will be significantly cheaper than an Optacon yet have most of the facilities offered by the Kurzweil reading machine.

The major problem with this type of research is the conversion of the laboratory prototype to an available aid at a reasonable cost. This conversion process is very expensive and normally requires substantial grants from external sources such as the government. Government departments tend to look at potential national, rather than international, sales so are discouraged by the considerable investment required for a relatively small

number of sales. In the past electronic mobility aids have not proved very popular in the UK; less than 200 have been sold and most of these have been simple obstacle detectors.

The second group of aids are those which use high technology which has already been developed. These include microcomputer-based braille or speech systems and closed circuit television reading aids for the partially sighted. These aids can be developed for a fraction of the cost of the previous group.

Clarke and Smith Industries Ltd developed, with the financial support of the government, a paperless braille device (Fig 2). This was designed specifically for use by blind programmers, although it has been used by other blind people needing a computer terminal.

Fig 2 Brailink (courtesy Clarke & Smith Industries Ltd)

Many of these aids use existing hardware and the research worker develops special software to permit the equipment to be used by or for the blind. For instance BITS (Braille and Ink-print Text-processing System) is a word-processing system which outputs in ordinary print, large print and contracted braille (Fig 3). In this case, the special software is the program to translate the text file to a good approximation to grade 2 braille; this is not a trivial task since grade 2 braille utilises 190 abbreviations and contractions governed by complex rules of pronunciation and meaning. BITS is being used by a number of organisations including a trade union, a major bank for corresponding with blind customers, an organisation for the deaf-blind, a blind

school for preparing class handouts, and local social service organisations.

Fig 3 BITS (courtesy RB Aids for the Blind Ltd)

This is an aid where the high cost can be justified by the service it can provide to a large number of users. Another example is the computer software which has been written to produce large print on a high-speed laser printer; this system is now in daily use for the production of large print statements of account for Lloyds Bank's visually handicapped customers.

A number of systems have been developed to make word processing accessible to blind typists. These systems have braille, speech or tactual and audio outputs. A typical system is BASIS (Braille And Speech Information System) which permits a blind person to input contracted braille and obtain printed output using full word-processing facilities. The algorithm for converting contracted braille to print is as complex as that needed for print to braille translation. Unfortunately all these systems are very expensive, and therefore sales are limited to blind schools and the government for loan to blind individuals in employment.

One of the few high technology aids to sell in significant numbers in the UK is closed circuit television for the partially sighted (Fig 4). There are over 38 models on the market of which six are British (Gill, 1984). Research, in Britain, is largely confined to the commercial producers developing variants on