

**CURRENT STATE OF THE RESEARCH
EFFORT AT VETERANS ADMINISTRATION
HOSPITAL, HINES, ILLINOIS^a**

John D. Malamazian, B. A.
Chief

Harvey Lauer, M. S.
Electronic Reading Machine Specialist

Central Blind Rehabilitation Center
Veterans Administration Hospital, Hines, Illinois 60141

This brief report will give you an idea of what we have done, are now doing, and hope to do at Hines in the electronic print reading machines, electronic mobility aids, and low vision programs.

READING MACHINES

The electronic print reading machine was the first special program offered to blinded veterans at Hines and was the beginning of our active participation in the VA research effort on electronic devices for the blind.

About 10 years ago, Mrs. Genevieve Miller took a short course in teaching the VA-Battelle Optophone and then taught Harvey Lauer (who was a braille teacher at the time) how to use the Optophone. Mr. Lauer became very interested in the device and worked very diligently, often on his own time, to improve his knowledge of the machine and his skill in its use.

^aDelivered by Harvey Lauer.

The Sixth Technical Conference on Reading Machines was held at VACO on January 27 and 28, 1966, to assist the then Prosthetic and Sensory Aids Service, Research and Development Division, in planning its research program for the future. Loyal Apple and Harvey Lauer represented Hines at this conference which was attended by scientists, engineers, and technicians whose work was related to reading machines.

At this time, it was decided that the teaching of the Optophone should not be integrated into the regular rehabilitation program but be offered as an in-patient concentrated course to selected blinded veterans possessing the aptitude, skills, and motivation necessary to learn how to use this machine. The same policy still exists today.

Since 1967, research funds have been provided enabling Harvey Lauer to work full time evaluating reading machines, developing screening tests and teaching methods, and teaching blinded persons to use the devices.

In 1967, the train-case size Battelle Optophone was replaced by the Mauch Visotoner, a smaller and more versatile instrument with the same audible code. Twenty persons received instructions and seven of these 20 became successful users of the Visotoner. Two persons were taught to use the Mauch Visotactor which gave a tactile output.

During 1971, several Visotoner users were introduced to a prototype of the Cognodictor, which is a character-recognition machine with a spelled-speech output.

The Visotoner and Visotactor were followed by the Mauch Stereotoner and the Telesensory Systems, Inc., Optacon in 1973. The Cognodictor is still in development at Mauch Laboratories.

During 8 months in 1974, Mr. Lauer instructed eight persons to use reading machines. Most stayed at Hines for 4 weeks' training including testing and several hours of preliminary exposure to both the Optacon and Stereotoner. Each person was then instructed on the device which he and Mr. Lauer felt best suited his abilities and needs. We feel that at this stage in the development of reading aids this is the only fair way to determine which type of machine is best for an individual.

Seven of the eight students are male veterans with an average age of 50 and the other one is a young woman teacher from a civilian agency. Four are using the Stereotoner and four the Optacon. All eight made slow progress; none finished the basic course materials while at Hines. Mr. Lauer had to augment the teaching materials in order for them to continue the basic course at home. One of the Optacon students has dropped out and one of the Stereotoner students, the young woman, may drop out. The remaining students are still well motivated and working diligently despite low reading rates. Mr. Lauer has been following the progress of all his students by telephone.

During the past 2 years, several speech-compressing tape recorders

have appeared on the market which will permit sighted and blind persons to increase reading rates by enabling recorded material to be played back rapidly without pitch distortion. The increased reading rate exceeds 400 words per minute. Currently these units are priced at \$550 to \$1,000; hopefully, further development of hardware and the commercial market should reduce the price to \$200 within a few years.

We have prescribed and the VA has issued about 12 Varispeech machines to blinded veterans who are either college students or employed in jobs which require much reading. So far, we have prescribed one Cambridge VSC Cassette Recorder.

While our major effort has been concentrated on reading aids, some preliminary study has been done on such devices as improved light probes and a paper money identifier machine.

Future plans include teaching reading machines to selected students. Screening tests for the Optacon can be conducted either at the Center, or on a contract basis for those men who cannot come to the Center. The Stereotoner screening test can also be administered either at the Center or in the field.

With adequate staff we should be able to accept 20 reading machine students a year.

ELECTRONIC MOBILITY AIDS PROGRAM

The Kay-Ultra Sonic Torch was an early electronic mobility device evaluated at Hines. This was an informal evaluation conducted by several interested mobility specialists during their spare time.

A formalized mobility-aid evaluation program began in 1969 when three members of the orientation and mobility staff were selected to do preliminary studies on the C-4 Laser Cane. On a part-time basis, the instructors conducted several controlled experiments to acquaint themselves with the device. This was followed by practical work under the blindfold to test the reliability of the device and develop teaching methodology.

In 1970, with the financial support of the then Research and Development Division, Prosthetic and Sensory Aids Service, a formal Orientation and Mobility Research Program was initiated at Hines. The objectives of the program related to field testing experimental mobility aids specifically and to the overall mobility task of blind persons in general.

A C-4 Laser Cane Conference was held at Hines in September 1970. This conference was attended by persons from the VA and several public and private agencies who had worked with the 12 early cane prototypes. During the conference, it was suggested that a formal evaluation format be developed. After the conference, an advisory panel was

selected with Dr. P.W. Nye as chairman. A protocol was developed for a preliminary evaluation of eight blinded veterans by O&M research personnel at Hines and Palo Alto VA Hospitals.

The evaluation program (August 1971-November 1972) consisted of a similar 5-week training and evaluation course at each Center, with a 9-month followup program, including two visits to the veteran's home to determine how well and often he used the cane in his community. Information was gathered in the form of interviews, questionnaires, and the video-taping of the veteran's performance. During this time, the VA contracted for the production of 35 new C-5 Laser Canes.

Concurrently in 1971, the preliminary evaluation of the Binaural Sensory Aid was started. In the following year and a half, 16 blinded veterans were trained at Hines and took part in a followup program. Eight of the 16 are still using the aid.

During the last year, a continuing effort has been applied to developing teaching materials, improving evaluation procedures, and preparing for the evaluation of the production models of the Laser Cane and the Binaural Sensory Aid. We have also devoted some time to the Lindsay Russell Pathsounder, the Mowat Sensor, and the Mims Seeing Aid.

We have tried two methods of selecting candidates for the Laser Cane and Binaural Sensory Aid. We have selected veterans who had completed a basic rehabilitation program and were fairly good long-cane users who came back for a 4- or 5-week specialized program with either the Laser Cane or Binaural Sensory Aid. We also have selected veterans who are undergoing the basic training program and were introduced to the electronic device at the same time. From our limited experiences we have concluded that it is better to select candidates who have completed the basic program and acquired some travel experiences away from a center. The experienced travelers can better compare the advantages and disadvantages of the electronic devices and know what **their** particular mobility needs are in their own environment. This **enables** them to determine better whether the electronic device is **beneficial or** not.

The Lindsay Russell Pathsounder is a simpler device **which** can be incorporated in the latter stages of a basic program and does not require an extensive training period.

We plan to continue training veterans with the Laser Cane and Binaural Sensory Aid as the aids become available. We plan on gradually having all our O&M specialists become qualified teachers of the Laser Cane and Binaural Sensory Aid by attending the new Electronic Mobility Aid Course at Western Michigan University.

LOW-VISION PROGRAM

The present Low-Vision Program began in February 1972 with the

use of an optometrist to examine veterans and prescribe visual aids. Prior to this time the program consisted of evaluation of visual performance with and without hand-held aids and monoculars. The optometrist brought the knowledge of special lenses, and with his assistance a systematic and comprehensive training program evolved.

The Low-Vision Program has as its goal the optimal visual functioning of those patients who have useful residual vision. The foundation for such a program rests on the awareness that improvement in visual functioning can be obtained in the majority of those legally blind who have residual vision better than light perception and projection.

There are three phases of the Low-Vision Program: 1. evaluation, 2. optometric low-vision examination, and 3. adaptive training.

The "evaluation" begins immediately following the admission to the Blind Rehabilitation Center and is designed to determine the visual functioning abilities of the patients in daily living situations and to establish specific needs.

The "optometric low-vision examination" is performed by an optometrist specifically trained in the examination of low-vision individuals. The objective of the examination is to identify the low-vision aids which will improve the patient's visual functioning and meet his needs.

The objectives of the "adaptive training" segment are: 1. to assist the patient in understanding the visual functioning problems imposed by his visual condition, 2. to assist the patient in understanding the adjustment needed to obtain improved visual functioning, 3. to evaluate and instruct the patient in the use of prescribed lenses, aids, or illumination, 4. to resolve any difficulties encountered in utilization of aids, 5. to place the patient on exercises which will further enhance his visual functioning abilities. On understanding his unique visual functioning situation, the patient is evaluated with prescribed lenses. In most instances the optometrist recommends several lenses for each specific task. After the patient has been given time to explore fully his functioning with each lens, he makes his selection of the one(s) most beneficial.

Simultaneously with this evaluation, specific adaptive training exercises are conducted in the proper utilization of the lens, proper focal distance, movement of the head and material, plus variation of illumination settings. The focal point will vary from lens to lens and for each specific task. Therefore, it is essential that the patient not only understands the dynamics, but is able to find quickly the correct focal distance and maintain it over extended periods of time. Various exercises also allow opportunity for potential problems to emerge and be solved prior to lenses being ordered.

The type and duration of adaptive training is individualized to the patient's particular functioning abilities. Most of the exercises deal with the improvement of fixation and tracking skills for primarily near vis-

ion. Many of the patients have not read for several months or years; therefore, it is necessary to include remedial reading skills. Exercises in letter discrimination and word recognition, followed by the reading of sentences and paragraphs for speed and comprehension, are quite beneficial.

From September 1972 to May 1974, a total of 119 veterans with low-vision were examined, evaluated, and trained. Significant positive improvement was obtained in 86 percent (102) of the veterans participating. In a majority of cases the improvement was in near vision (reading). The average near-vision acuity at the time of admission was 18-point print with correction. Eighteen-point print is the equivalent of newspaper subheadlines. After completing the program, the average near-vision acuity was increased to 5-point print or the equivalent of "want ads." In 96 percent of the cases improvement was made through the use of lenses in eyeglass form or CCTV, while 4 percent were improved with hand-held aids.

In the 17 patients where no significant improvement was noted, almost half lacked the motivation for the program or possessed glasses which were adequate and upon which no significant improvement could be made.

The following categories list the veterans served and equipment ordered:

September 1, 1972–May 31, 1974

Veterans Served

A. In low-vision program	
Positive improvement	67
No improvement	<u>3</u>
Total	70
B. In regular program	
Positive improvement	35
No improvement	<u>14</u>
Total	49
C. In both programs	
Positive improvement	102
No improvement	<u>17</u>
Total	119

Equipment Ordered

A. Closed circuit television.....	31
B. Prescription glasses.....	150
C. Other types of aids.....	<u>105</u>
Total	286

In looking toward the future the Low-Vision Program will be expanded to serve veterans better. Larger clinic quarters, more optometric consultant time at the Center, and increased staff are a few of the needs of the future. Research and evaluation capabilities to deal with innovations, such as the Starlight Scope, should be established to keep current with a rapidly changing field. A sound followup program conducted by the Low-Vision Specialist should be given serious consideration. This would allow more continuing and comprehensive service to the veteran by a qualified low-vision specialist while providing needed program feedback.