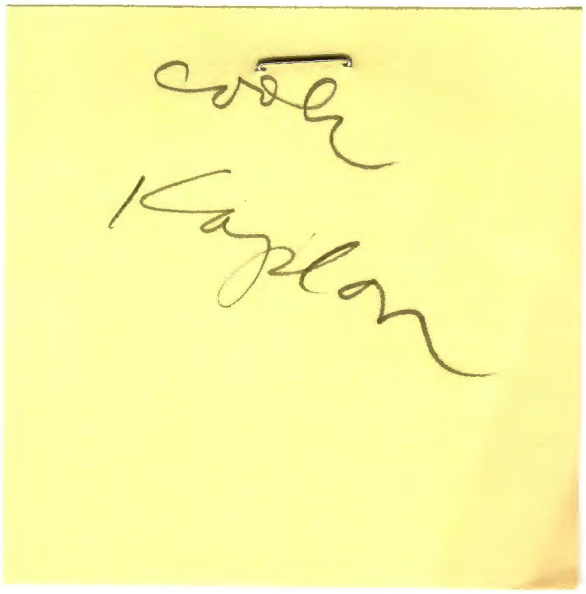

Kaplan

Office of Special Adviser to the President
for Consumer Affairs
Washington, D.C. 20201

July 15, 1985

Mr. Vincent Cook, President
IBM Federal Systems Division
6600 Rockledge Drive
Bethesda, Maryland 20817

301-453-8100

Dear Mr. Cook:

I am pleased to endorse Mr. Norman C. Hammond's request for a second year of his assignment as an IBM Loan Executive to the International Association of Business, Industry and Rehabilitation (I-NABIR).

As President and Chief Executive Officer of I-NABIR, Mr. Hammond has worked closely with our office in developing national program initiatives and priorities for the Projects With Industry (PWI) program to assist disabled consumers to achieve independence through rehabilitation and employment.

Under Mr. Hammond's direction, I-NABIR has been in the forefront in forging partnerships between business and government to strengthen private sector leadership and participation in initiatives for disabled people. Largely as a result of his leadership, a network involving more than 10,000 corporations and businesses, rehabilitation organizations, labor unions, and colleges and universities, is working through partnerships with over 250 Projects With Industry across the nation.

This Administration considers the partnership principle basic to its policy of allowing the American free market system to meet the needs of our citizens wherever possible and the Administration has commended this program, which has produced over 100,000 jobs for disabled people in the private sector, who are now earning in excess of $1 billion a year and paying an estimated $200 million a year in taxes.

Mr. Hammond's leadership role in the Inter-National Association of Business, Industry and Rehabilitation is critical to its continued success. His past experience in pioneering the early development of IBM's first Project With Industry in 1974 and his continuous involvement in its management up until September 1, 1984, greatly contributed to the project's high professional standing and nationally acknowledged success. This background along with his wealth of contacts in both the rehabilitation and business communities, uniquely equips Mr. Hammond to provide the necessary leadership needed to effectively manage and direct I-NABIR.

I would like to add my gratitude to that of the thousands of disabled people whom I-NABIR has helped to IBM for making Mr. Hammond's invaluable services available to I-NABIR.

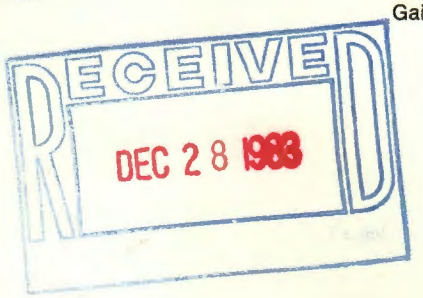
We deeply appreciate your assistance and hope that it will be possible to continue Mr. Hammond's Executive Loan assignment.

Sincerely,

Virginia H. Knauer
Special Adviser to the President
for Consumer Affairs

bcc: Norman Hammond
Bob Steeves_____
Howard Seltzer_____
Tom Fleming_____
TJF/dbc
Typed: 7-15-85

International Business Machines Corporation
18100 Frederick Pike
Gaithersburg, Md. 20879



Bob + Joe say "no" on this one. I agree - decline, send back - up to Tom - HE 12/15

December 20, 1983

Ms. Virginia H. Knauer
Special Advisor to the President
for Consumer Affairs
United States Office of Consumer Affairs
Washington, D.C. 20201

30/240-0111

Dear Ms. Knauer,

The sixth annual meeting of the Association of Rehabilitation Programs in Data Processing (ARPDP) will take place in the Disneyland Hotel, Anaheim, California on March 20-23, 1984. Concurrent with the ARPDP meeting is the "Abilities Unlimited International Exposition". Over 100,000 people attended this latter meeting in 1982.

We would be honored if you would agree to address the ARPDP meeting on Thursday, March 22, 1984. If you accept our invitation, you could choose to make the keynote address in the morning or to speak at the banquet that evening. "Commitment to Excellence" is the theme for this meeting.

ARPDP is an organization of rehabilitation, training and business professionals dedicated to the creation of programs for training and placing severely physically disabled people in data processing positions. ARPDP was organized as a result of a meeting IBM convened in Bethesda, Maryland of the then ten operating projects initiated as a result of the IBM Projects with Industry Agreement and others interested in training programs for the severely physically disabled. The first annual meeting of ARPDP took place in Birmingham, Alabama with subsequent meetings in Philadelphia, Pennsylvania, San Francisco, California, Atlanta, Georgia and Long Island, New York.

cc: Bob Joe Marlin Tom

04M/3533/01

The organization has grown to a membership of 25 projects with several additional projects as candidate members. Interest in ARPDP has continually grown to the point where over 700 copies of its newsletter, "Viewpoint", are presently distributed, many to people outside of the United States. In addition several projects located in Canada have applied for ARPDP membership. The success of the projects that make up the membership of ARPDP is shown in the 128 classes of 1183 students that have graduated and the 80% of the graduates that are working as computer programmers. With time we expect this placement rate to exceed 85%.

The enclosed material will provide you with additional background on ARPDP and the IBM PWI. Should you desire additional information, please call me locally at 840-4980.

Thank you for considering this request for your participation in the ARPDP meeting. Should you agree to speak you will have the opportunity to meet with a very unique organization which combines the talents of rehabilitation, training and business towards a better life for people with disabilities.

Sincerely,

Irwin Kaplan

Irwin Kaplan
Manager
Rehabilitation Training Programs Department

04M/3533/01

International Business Machines Corporation

Office of Vice President, Management Services
Federal Systems Division

6600 Rockledge Drive, Bethesda, Maryland 20817

August 20, 1985

Ms. Virginia H. Knauer
Special Adviser to the President
for Consumer Affairs
Washington, D.C. 20201

Dear Ms. Knauer:

Mr. Cook has asked me to reply to your letter of July 15, 1985 requesting consideration for an extension of the assignment at I-NABIR for Norman C. Hammond.

Your endorsement of Mr. Hammond's request for an extension of his assignment as an IBM loan executive to the Inter-National Association of Business, Industry and Rehabilitation is certainly a tribute to his accomplishments during his social service leave.

Unfortunately, we will not be able to offer an extension to Mr. Hammond for a second year assignment with the I-NABIR organization.

Sincerely,

S. A. Lambly

SAL:egv

cc: Bob Howard

VK
Tom had written endorsing Norman Hammond for a second year assignment as an IBM loan executive to Int'l assn. of Business, Industry & Rehab.
OK

THE WHITE HOUSE

WASHINGTON

23 JAN 1984

Dear Mr. Kaplan:

I am very disappointed to have to tell you that I cannot accept your gracious invitation to serve as your keynote speaker on March 22, 1984, at the Sixth Annual meeting of the Association of Rehabilitation Programs in Data Processing in Anaheim, California.

During this period my schedule is unusually heavy with preparations for National Consumers Week activities across the country, and a number of already confirmed commitments.

I am keenly aware of the importance of your Association's efforts in providing national leadership, as well as technical and professional assistance, to program initiatives that assist disabled people to achieve independence through employment in the field of computer technology. I want you to know that you have my complete cooperation and support in this vital work.

I also want to congratulate you personally for your excellent IBM-Project With Industry program. Its success is a tribute to your leadership and dedication.

Sincerely,

Virginia H. Knauer
Special Advisor to the President
for Consumer Affairs

Mr. Irwin Kaplan
Manager
~~Rehabilitation Training Programs~~
Department
International Business Machines
Corporation
18100 Frederick Pike
Gaithersburg, Maryland 20879

Bob Steeves_____
Howard Seltzer_____
Tom Fleming_____
1-20-84
TF/dbc

International Business Machines Corporation

18100 Frederick Pike
Gaithersburg, Md. 20879

Bob r "no" Joe says no on this one. I agree - deadline, send back - sup to Tom HK 12/15

December 20, 1983

Ms. Virginia H. Knauer
Special Advisor to the President
for Consumer Affairs
United States Office of Consumer Affairs
Washington, D.C. 20201

Dear Ms. Knauer,

The sixth annual meeting of the Association of Rehabilitation Programs in Data Processing (ARPDP) will take place in the Disneyland Hotel, Anaheim, California on March 20-23, 1984. Concurrent with the ARPDP meeting is the "Abilities Unlimited International Exposition". Over 100,000 people attended this latter meeting in 1982.

We would be honored if you would agree to address the ARPDP meeting on Thursday, March 22, 1984. If you accept our invitation, you could choose to make the keynote address in the morning or to speak at the banquet that evening. "Commitment to Excellence" is the theme for this meeting.

ARPDP is an organization of rehabilitation, training and business professionals dedicated to the creation of programs for training and placing severely physically disabled people in data processing positions. ARPDP was organized as a result of a meeting IBM convened in Bethesda, Maryland of the then ten operating projects initiated as a result of the IBM Projects with Industry Agreement and others interested in training programs for the severely physically disabled. The first annual meeting of ARPDP took place in Birmingham, Alabama with subsequent meetings in Philadelphia, Pennsylvania, San Francisco, California, Atlanta, Georgia and Long Island, New York.

cc: Bob Joe Nolan Tom

04M/3533/01

The organization has grown to a membership of 25 projects with several additional projects as candidate members. Interest in ARPDP has continually grown to the point where over 700 copies of its newsletter, "Viewpoint", are presently distributed, many to people outside of the United States. In addition several projects located in Canada have applied for ARPDP membership. The success of the projects that make up the membership of ARPDP is shown in the 128 classes of 1183 students that have graduated and the 80% of the graduates that are working as computer programmers. With time we expect this placement rate to exceed 85%.

The enclosed material will provide you with additional background on ARPDP and the IBM PWI. Should you desire additional information, please call me locally at 840-4980.

Thank you for considering this request for your participation in the ARPDP meeting. Should you agree to speak you will have the opportunity to meet with a very unique organization which combines the talents of rehabilitation, training and business towards a better life for people with disabilities.

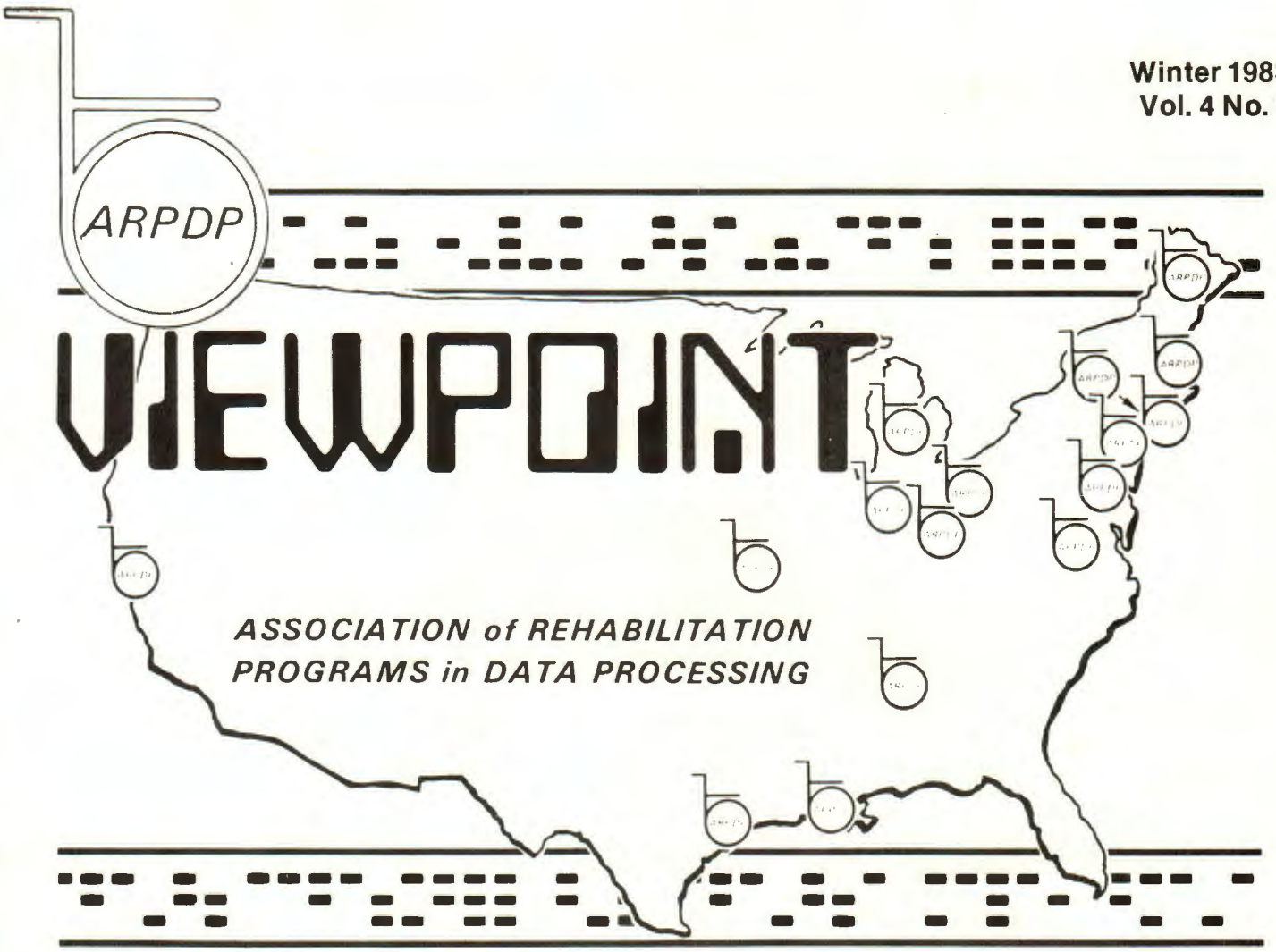
Sincerely,

Irwin Kaplan

Irwin Kaplan
Manager
Rehabilitation Training Programs Department

04M/3533/01

Winter 1983
Vol. 4 No. 1



BECOMING ACCESSIBLE TO VISUAL DISABILITY

The statement that computer technology has had profound impact on vocational rehabilitation for persons with disabilities borders on profound understatement. This impact is perhaps most strongly felt in the area of blindness and visual impairment. Computer programming has been indentified as a potential area of employment for blind persons because it is primarily mental work. The early experience of blind persons working in computer programming brought mixed results with only the exceptional succeeding. Others faced difficulties because some of the programming tasks presumed visual capabilities. Braille output, besides being cumbersome and usable only by blind persons, often diverted company resources from company production.

The first training programs in data processing specifically for blind persons began in the mid-60's with the Systems Development Corporation in Santa Monica, CA, and the MEDCOMP Foundation in Cincinnatti, OH. Both of these initiatives began through HEW funding. Other small programs began here and there across the country but the state of the art continued to limit success only to gifted individuals. For a decade, the availability of training services for blind programmers seemed to plateau.

Almost paralleling the development of the micro computer, the late 1970's saw a rapid increase in training opportunities in computer programming for individuals with visual disabilities. Some noteworthy examples include Arkansas Enterprises for the Blind, Baruch College in New York, and ARPDP projects in Berkeley, CA, Plainwell, MI and Philadelphia, PA. A short time later the

(continued on page 9)

ON THE INSIDE

VIEWPOINT

Association for Rehabilitation Programs
In Data Processing

Volume 4, Number 1 ***Winter 1983***

EDITOR
Jim Vagnoni, Philadelphia, PA

ASSOCIATE EDITOR
Mary Hu, Philadelphia, PA

PRODUCTION ASSISTANTS
DP Graphics, Philadelphia, PA

CONTRIBUTORS
Allen Blumenthal, Visualtek
Douglas Brent, Apollo Electronic Visual Aids
Ellen Calhoun, Columbia, MO
John F. Connolly, Jr., Philadelphia, PA
Peter Durand, Arts Associates
David Holladay, Raised Dot Computing
Robert Leneway, Plainwell, MI
David Simpson, Bell of Pennsylvania
John M. Williams, Maryland Computer Services

VIEWPOINT/ARPDP
Physically Handicapped Training Center
University of Pennsylvania
4025 Chestnut Street, 3rd Fl./T7
Philadelphia, PA. 19104

VIEWPOINT is a quarterly newsletter addressed to the community of individuals interested in training and placement of persons with handicapping conditions in the occupation areas of data processing.

VIEWPOINT is edited and published by the PHTC, University of Pennsylvania and is the principal publication of the Association for Rehabilitation Programs in Data Processing.

VIEWPOINT tries to validate all information supplied by contributors, but it cannot be responsible for inaccuracies or misrepresentations in copy by outside sources.

To become an ARPDP Associate Member, an annual contribution of $15.00 domestic or $25.00 foreign is requested to help defray the cost of the organization and the newsletter.

Manuscripts to be considered for publication in **VIEWPOINT** should be from 4-10 double-spaced pages in length and should be submitted in duplicate.

Viewpoint Editor Jim Vagnoni with Associate Editor Mary Hu

This winter '83 VIEWPOINT represents a significant departure from previous issues, and I trust, a positive and productive movement in the development of our organization and its publications. VIEWPOINT began and has been sustained through the efforts of individuals motivated by their personal commitment to the goals of an organization such as ARPDP, i.e. providing opportunities for severely disabled individuals to have independent and productive lives by creating the potential for employment in the field of Data Processing. The purposes and functions of ARPDP must be anchored in this one goal. Indeed, ARPDP's stated objectives and structures are all linked to the development and enhancement of programs designed to accomplish this employment goal. Linked as we are by our willingness to share our collective knowledge and experiences, it is not surprising that communications is a vital activity. These communications occur through our business meetings and annual conferences, the work and successes of our subcommittee projects and through the pages of our newsletter/journal.

The aforementioned departures or developments in Viewpoint are in format and content, and are consistent with ARPDP and VIEWPOINT objectives. In regard to format, VIEWPOINT will always be a source of inter-project information sharing. The features that have evolved with the newsletter such as Updates, Viewpoints, Project to Project, and the newly added, ARPDPeople will continue on a semi-annual basis as the structure for the Fall and Spring issues. The Winter and Summer issues will focus — hopefully with some depth — on a particular area of common Project Activity. The potential topics are limitless. This VIEWPOINT, for example, takes a first look at the issues concerning Blindness. Articles were chosen to provide a beginning perspective for Data Processing training for persons with visual impairments and include discussions of equipment, facility accessibility and innovative accomodations and personal experiences. Cleary, one issue of VIEWPOINT can only scratch the surface on any topic, further indicating that the well spring of subjects will never run dry.

What could be in danger of becoming arid is our own interest and enthusiasm for sharing our ideas and experiences. I have neatly led up to the editorial statement that this publication is *OURS* and its usefulness to one another depends solely on our contributions. I trust ARPDP affiliates as well as VIEWPOINT readers will share in the enthusiasm of growth and add to its continued vibrancy by contributing to our journal.

VIEWPOINTS: EQUIPMENT

COMPUTER TERMINAL DEVICES FOR VISUALLY DISABLED USERS

The following articles present information on the many adaptive terminals now available for blind and visually impaired users. Most manufacturers are represented, but we are certain that we missed some and were unaware of others. One major omission is the VersaBraille — an exceptional soft brailling device with computer interface capability — which we decided was not, strictly speaking, a terminal. However, an article by David Holladay does discuss the use of the VersaBraille in tandem with the Apple II micro.

The information in the articles were gleaned from the manufacturers' own materials. DON'T DESPAIR if you would like help in the form of opinion. "Connolly's Corner" offers such personal perspective. Space necessitated that the column be limited however. Large print devices were chosen because Mr. Connolly recently had first hand contact with them. The opinions expressed are Mr. Connolly's and not necessarily the position of ARPDP or any of its affiliates.

The article by John Williams is a testament to the number of speech terminals now in use across the country but does not clearly discriminate among these many talking devices.

While subsequent VIEWPOINTs will no doubt bring more detail regarding computer devices and visual liability, we believe this to be an excellent beginning.

APOLLO ELECTRONIC VISUAL AIDS

By Doug Brent

Apollo Electronic Visual Aids has developed two products for partially sighted people. These products are the Apollo Computer Terminal System and the Apollo Professional Typing System. The Apollo Computer Terminal System (A.C.T.S.) is a special computer terminal providing ready access to host computers. The Apollo Professional Typing System (A.P.T.S.) is a typewriting system specifically designed for partially sighted people.

The basic components of both systems are a monitor, a keyboard and a dedicated microcomputer. The monitor's display is similar to that of a standard CCTV-type aid. However, the method for obtaining enlarged output is quite different. When the operator strikes a key on the typewriter-like keyboard, the corresponding letter is directly displayed in one of sixteen sizes on the monitor. The smallest size is equivalent to ordinary large print. The largest size is about six inches high. Variable spacing between letters and between lines is also available.

A.C.T.S., while maintaining compatibility with most computer terminals, provides many features for the partially sighted operator. For example, A.C.T.S. stores more than 8,700 characters of dialogue with the computer for review by the operator. The operator can choose to view the screen in a scrolling ("Times Square"-style) mode, a non-scrolling line-oriented mode, or combinations of both. Further, all special A.C.T.S. functions are accessed from a single, main keyboard making training and operation easy.

In addition to normal size printing, A.C.T.S. can print in one of sixteen magnified sizes. Large print notes to carry around, or a large print newsletter can be produced by simply pressing the PRINT key. Most important, both A.C.T.S. and A.P.T.S. are designed to meet the full range of vision-aid needs at the work place. Each contains a fully integrated Apollo electronic visual aid. Each is physically compatible with the modern work place, providing all CCTV-aid and computer functions in a package only 24" wide. Each is a powerful vocational tool for the partially sighted.

IBM MARKETS TALKING TERMINAL

The IBM Corporation has adapted their standard 3278 model 2 display unit to provide audio output. Voice synthesizer of the IBM Talking Terminal is mounted internally under the 3278 display cover. Apart from the differences in the keyboard and control knobs, the 3278 looks like any other IBM terminal of the same model.

All fluctuations of the audio output feature are obtained by depressing one key or combination of keys on the keypad. Three audio formats are provided: a pronounce format which takes each word and pronounces it separately; a spell format which speaks words, characters, spaces, individually, and a punctuate format which identifies by a sound the number of spaces, if more than two, and punctuation marks. The 3278 Talking Terminal allows for programmable pronunciation as well as a silence feature.

The IBM operates in either a cursor or internal pointer mode. In the cursor mode, the user depresses the appropriate key and the machine reads out the row number and column number where the cursor is located on the screen. The user can choose the following options: to hear the word at, before, or after the cursor; the entire row where the cursor is located, or the row before or after the row; or the complete screen can be read regardless of cursor position. The internal pointer allows for a cursor control key to permit a user to make an entry on any position on the screen. The internal pointer provides the user significant flexibility in moving to and from specific zones on the screen. Obviously, this system is the only available talking terminal immediately compatible with an IBM host mainframe... More information regarding the IBM 3278 Talking Terminal can be obtained from local IBM marketing representatives.

MORE ON

ARTS COMPUTER PRODUCTS

by Peter Durand

ARTS Computer Products, Inc. a Boston based firm offers talking, large print and Braille devices which are compatible with a variety of computer systems supporting the RS232 interface. Those systems include:

ORATOR I & II. The ORATOR talking computer terminal speaks all the information which is usually displayed on a computer system. The ORATOR can speak any word in the English language, including proper names. The VOTRAX speech synthesizer board generates basic speech elements called phonemes and includes electronics to filter out background noise. ORATOR I has manually controlled pitch, variable from a deep bass to a high treble, and an adjustable speaking rate, ranging from a 45 to 720 words per minute. Keyboard-selectable features include silencing of punctuation, lengthening pauses between words, indicating capitalization, and numerous additional speech parameters and terminal functions. ORATOR II features the same unlimited vocabulary as ORATOR I. One way to describe the differences in the speech is that ORATOR II has a considerably stronger treble component than ORATOR I. ORATOR II uses a VOTRAX SC01 Synthesizer chip and has discrete pitch variation which is coupled to the speaking rate.

EXPAND—A—VIEW (LPVT). ARTS large print video terminal was designed especially for visually impaired individuals. The solid clear characters displayed by EXPAND—A—VIEW may be adjusted in size to meet individual visual requirements. Both the height and width of the characters are increased proportionally so that enlarged characters resemble the smaller ones typically displayed by computers. Twelve different sizes of characters between ¼ and 5 inches high may be selected and the size of the space between the characters can be adjusted. EXPAND—A—VIEW's modular design allows the partially sighted to choose any suitable monitor from 12" to 25". Larger monitors enlarge the character size or the width of a line while smaller monitors are more portable. The normally sighted may also share ARTS terminals with the visually impaired. An inexpensive 24 line by 80 character video terminal can be substituted for the ARTS monitor when a standard video display is required. **COMBO** terminals or combinations which have both speech and large print capabilities are also available.

HANDY-MAN. By selecting appropriate software, HANDYMAN can become a personal computer, a business computer with financial and secretarial capabilities or a computer for students needing word processing or programming languages. More than 200 special application programs run under the CP/M operating system. Computer data base systems such as COMPUSERVE and SOURCE can be contacted with HANDYMAN by using simple telephone accesories. Information received from a data base can be stored on HANDYMAN and reviewed whenever required.

DOTMAN. DOTMAN, ARTS embosser, can produce Braille on regular computer paper for temporary use or on heavier Braille computer stock for permanent storage. DOTMAN is a simple Braille embosser with only six moving parts. Because all embossing operations are computer controlled, dots never occur across page breaks, words are never broken at the end of lines and the top of the page never drifts. The embosser uses a Braille translation program included with the embosser.

DOTTRAN. DOTTRAN is a program that allows a computer to translate its output into GRADE II Braille. Until DOTTRAN, Braille translation programs stored large lists of the most commonly used words, along with their correct translation. This offered a limited vocabulary while using an enormous amount of computer time and memory. DOTTRAN minimizes the use of lists by making the translation process algorithmic. In effect, DOTTRAN thinks rather than memorizes, combining unlimited vocabulary with efficient use of computer time and memory. DOTTRAN has been designed to correctly contract statements typically occuring in programming languages.

ARTS EXPAND-A-VIEW (LPVT) pictured on page 15.

VISUALTEK

Visualtek announces the Large Print Computer (LPC), a microcomputer designed expressly for the low vision user. Visualtek has added the LPC to its line of video aids to help ensure the inclusion of the partially sighted in the new career opportunities now developing in the computer field. Some of the highlights of the LPC are that it displays large, clear, easy-to-read data on a screen; it requires no special program to enlarge the displayed letters which is an automatic feature; and it is easy to operate, responding quickly to fingertip control. The Visualtek LPC can be used as a free-standing microcomputer for home or business use, or as a terminal connected to a large host computer. It will permit partially sighted persons to undertake studies or jobs requiring computer access with the same ease as fully sighted peers.

EQUIPMENT...

MARYLAND COMPUTER SERVICES

TOTAL TALK is a talking terminal programmed to speak in much the same way a child is taught to speak phonetically. The speech is produced by the VOTRAX VSB Synthesizer Board which is capable of producing 64 different phonemes (a sound unit that distinguishes one utterance from another such as th, sh, long and short vowels). A microprocessor converts groups of letters into digital codes corresponding to these phonemes. It employs English pronunciation rules such as when a vowel is pronounced long or short. For example, the silent 'e' followed by a space or punctuation and preceded by a consonant which in turn is preceded by one or more vowels is silent. Approximately 400 such rules enable TOTAL TALK to produce intelligible full word speech. Its vocabulary is unlimited.

TOTAL TALK's speech synthesizer, video screen, earphone jack and control knobs are housed in one unit. A separate keyboard is attached by a cable. The user can listen to all of the transmitted data a page, line or single word at a time. It easily switches from full work speech to spelled speech (a character at a time) output enabling any work or special computer character to be verified. The speech rate (45 to 720 words per minute), pitch, tone and volume are adjustable.

TOTAL TALK easily connects to most computer systems. The communication parameters are set from the keyboard and handle a wide range of protocols. All parameters can be vocalized, enabling the user to change or verify them.

INFORMATION THRU SPEECH (ITS) is a personal computer system providing information both visually and vocally. With ITS, data appearing on the display screen is spoken in an easily understood synthetic voice with adjustable speech rate. Users listen to all of the information on the display screen, a single line or a word at a time. Information can be spelled or repeated for verification.

A speech pad allows the manipulation of the speech functions and cursor movement with one hand. This allows information to be reviewed quickly and easily. For words that do not follow standard rules of English pronunciation abbreviations, codes or computer nmemonics, ITS allows special sets of exception rules to be added. These rules will supercede the standard rules for pronunciation.

ITS combines the Hewlett-Packard HP 124 professional computer and MCS' state-of-the-art speech technology into a single package. The HP 125 is an advanced low-cost computer system combining the power of a dedicated Z-80A system microprocessor and 64K bytes of system memory. The HP 125 has full capabilities as an interactive computer terminal with its own microprocessor-based intelligence.

ITS is used by blind lawyers, teachers, researchers, secretaries, counselors, librarians, students, computer professionals, administrators, engineers, programmers and many other professionals.

Maryland Computer Services Total Talk II

An option with ITS is a Braille display that allows information on the screen to be represented in refreshable Braille. The Braille display uses an 8-dot cell and is 40 characters long.

TIM II is an information retrieval program that comes with ITS and enables you to access multiple items of information. Any alphanumeric information can be stored on subjects such as account number, name, purchase order number, grant number, job classification, etc.

TOTAL TALK and ITS are developed and distributed by Maryland Computer Services, Inc. in Forest Hill, Maryland. MCS' speech products are being used at over 200 installations and many ARPDP centers.

Commentary:

CIL COMPUTER TRAINING PROGRAM AWAITS MCS TOTAL TALK

We are excited at the prospect of receiving our Maryland Computer Systems Talking Terminal which has been donated by Foremost McKesson. The terminal will help our blind students' by 'reading' the CRT screen in a synthetic voice and let them know what's on it. With a pair of earphones, it should disturb nobody. Since the Talking Terminal is built around the Hewlett-Packard HP/125 micro computer, it is completely compatible with our other HP/125's.

EQUIPMENT. . .EQUIPMENT. . .EQUIPMENT

CROSSROADS ACCESSIBLE TO BLIND PROGRAMMER TRAINEES VIA TRIFORMATIONS PRODUCTS

Crossroads Rehabilitation Center is the ARPDP Project affiliate in Indianapolis. To provide programmer training to visually disabled students, Crossroads has developed a configuration that includes braille and speech output. For Braille, Crossroads uses the Triformations LED-120 which provides high speed hard copy, "readable" to blind programmers. Triformation FSST-3 provides for the speech capability. Obtained through a grant from Indiana Rehabilitation Services in 1981, the Free Scan Speech Terminal, Model 3 (FSST-3) has been in operation at Crossroads since January, 1982 and has allowed visually impaired students to receive computer output in audible form. Using function controls, the FSST-3 scans material according to the operator's instruction. When the specified data is located, the terminal verbally reads out the information at a rate determined by the operator. A speech switch permits the operator to increase the rate at which the machine audibly reads the material, allowing for increasing levels of efficiency.

The Line Embossing Device is a braille terminal and high speed braille printer that can produce braille from a keyboard, from a computer, from magnetic cassettes or from nearly any other source of coded information. The LED-120 outputs its forty character braille lines on Fanfold, continuous form paper, at 180 lines a minute. Made by Tri-Formations Systems, Inc. of Stuart, Florida, the LED-120 has been of great assistance to visually impaired students learning the skills of computer programming.

THE VERT SYSTEM

Manufactured by Automated Functions, Inc. of Washington D.C., the VERT (Verbal Emulation in Real Time) is a self-contained speech unit connected in RS-232C communication line between computer and any terminal. Costing between $5,000 and $6,000, this device employs the Votrax VSB single board speech synthesizer and is capable of independent variation of speech rate and pitch as well as programmable speech rate control to enhance the pronunciation of certain words. The VERT allows a user to review text saved in memory by storing in its buffer the most recent 12,000 characters. In addition, the VERT can repeat text by phrase, sentence or paragraph.

The VERT, of course, must be used in conjunction with a standard computer terminal. The VERT has two ports, one connected to the terminal, the other to the computer or modem. The VERT, then, serves as a black box type interface between the host computer and the terminal, receiving and transmitting characters back and forth. As with other talking terminals, the VERT uses ASCII code, and thereby is no more usable than any other talking terminal with IBM host computers. The VERT provides for speech control parameters by using truth tables to determine whether to spell or pronounce words or certain alphabetic acronyms. Again, as with other talking terminals, the VERT offers the user the ability to define translation and pronunciation preferences. Also, the VERT can be made to remain silent until a specific speech command or pre-defined statement prompts the terminal otherwise. More information regarding the VERT is available from Automated Functions, Inc. Suite 813, 4545 Connecticut Avenue, N.W., Washington, D.C. 20008.

Missouri Project's LED-120

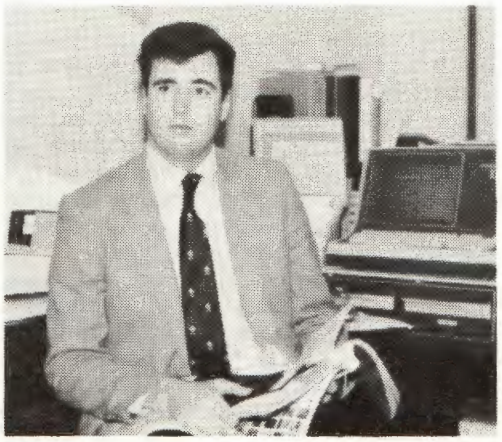
Commentary:

TODCOMP AND THE LED 120

Blind students enrolled in TODCOMP (Training of the Disabled in Computer Programming) at the University of Missouri-Columbia have been completing class assignments on the LED 120 Braille computer for four years. The LED 120 has needed little repair during the four year period at TODCOMP. Student programmers use a standard keyboard to enter information to a host computer and receive information from that host in Braille. Obviously, visually disabled students using LED 120 must be able to read Braille. The printed Braille provides students with a hard copy allowing them to take their work away from the terminal. The LED 120 has also been used to support other blind students at the University, e.g. textbooks have been brailled for blind law school students.

VIEWPOINT

Connolly's Critical Commentary on Current Computer Contraptions



LARGE PRINT TERMINALS AND TERMINAL ACCESS DEVICES

By John F. Connolly Jr.

Many products are now gracing the market whose vendors proclaim breakthroughs in LARGE PRINT access to computer terminals for visually impaired users. Some products are terminals, some are programmable microcomputers, some are both; some are devices which allow large print viewing of standard terminals. All the terminals are ASCII asynchronous supporting the RS-232 interface. I have chosen to critique the devices which function as terminals or use standard terminals. I am a firm believer that many of these firms would stick to making large print terminals which interface with microcomputers and leave the manufacture of the latter to the experts like IBM and Apple.

ARTS, Inc. (entrepeneur Peter Durand's firm) has had a large print terminal on the market since 1979. Two new devices are manufactured by Visualtek, a pioneer in "camera to monitor" large print viewing systems. Apollo Electronic Visual Aids, a division of Apollo Lasers (an Allied Chemical subsidiary whose expertise is in lasers and laser printers) has also introduced two new products. PHTC has been equipped with the ARTS terminal since 1981 and I recently had a chance to closely examine Apollo's and Visualtek's products at a demonstration at the Center. I review them below:

ARTS EXPAND-A-VIEW Large Print Video Terminal (LPVT): The ARTS LPVT has been available since 1979. It is essentially a "dumb" terminal developed from the "bottom up" by Peter Durand. Regretfully I have no idea what the processors and circuitry consist of inside the "box."

Strengths: For a product which has been around for a while, the LPVT is not bad. The LPVT allows for 12 different sizes of print, adjustable axes (shapes) for its characters, and reverse video. In addition the LPVT permits the user to adjust the space between characters. Finally, the EXPAND-A-VIEW can accommodate monitors from 12" to 25" as well as standard 24 by 80 character video terminals. The device functions barely adequately as a "dumb" terminal (which, when there has been nothing else available, could be perceived as a "strength.")

Weaknesses: While the large print features are not bad, the *terminal* capabilities of the LPVT are barely acceptable. First, the most important key of all is missing — there is no break key (although ARTS claims to have built one in, at a demonstration at the PHTC three months ago I didn't see one). Second, the buffer takes to long to clear; one has to wait until a line 'fills up' until it will be displayed, at which time it is zapped at you faster than you could possibly read it. Finally, now that there are other devices on the market I can honestly say that the EXPAND-A-VIEW LPVT is not worth the price — last I heard $8,450 including monitor — even if the price came down $3,000 one could get a better deal elsewhere.

Computer Terminal Visual Aid System (CVS): The Visualtek CVS is an "improvement" of a product which has been on the market for some time. The CVS is a thingamagig which fits over "any" terminal. The frame consists of metal bars, mirrors, and a camera which moves around showing an enlarged image of the terminal screen on a separate monitor. The camera is moved about by electric motors (one of the new features) which are controlled either manually through a box or by a pedal.

Strengths: The CVS is the one gadget on the market which solves the terminal interface problem — because it is not a terminal, it uses those available in the DP shop.

Weaknesses: Rube Goldberg was not far away when the CVS was both conceived and manufactured. The CVS is so mechanically complicated with all its motors (for positioning the camera and focusing), pedals, cameras, and mirrors — I wanted to look for a road scene to appear and a slot for a quarter. There is too much to go wrong on the CVS and it's too complicated to operate. In addition, Visualtek salesmen told me that despite the mechanical clutter on the desk, the terminal, frame and camera could be placed elsewhere — leaving only the keyboard, monitor, and pedals in front of the user. Fine, but if one shares this terminal with a non-visually impaired co-worker, he/she must crawl under the desk or into the closet to use the terminal. The CVS fails in the most important area as well — the print is fuzzy (I wonder why) and the user constantly has to focus. The real stinger is the price; with reading device it is

(continued on page 17)

BRAILLE AND SMALL COMPUTERS

by David Holladay

Blind persons have more to gain than sighted persons from the computer revolution in several ways. Increasing numbers of computer-based tools for the blind are being created which expand the potential capabilities of a blind person who is connected to a computer. At the same time the number of job functions which involve communication between computers and humans is constantly growing. These two trends reinforce one another to create ever-expanding job horizons for the blind.

From this glorious promise and potential comes a wrenching reality: adapting small computers for visually disabled students is very difficult. Small computers such as the Apple II, however, have been found to be adaptable for visually disabled persons. The Apple II is constructed with eight slots in the back which may be used for plugging in additional devices. The manner in which this is arranged makes it particularly easy to adapt the computer to meet special needs.

There are two ways in which computer output can be made accessible to blind persons: voice output and braille output. Voice output is an inexpensive option for many small computers, certainly for the Apple II. Currently, braille machines carry a stiff price tag, although this may soon change.

Voice output devices, however, can also be disappointing. You may buy a box which will run voice output, plug it into the computer and successfully run the demonstration program. Then what do you do? The voice box is of little use if the available software will not divert characters from the screen to the voice output. Current research efforts are being conducted to adapt a broad range of existing software for voice output. This capability for blind persons to use the same programs as sighted individuals would be an exciting development.

Despite the cost advantage of voice output, I am a big fan of braille, since it has some distinct advantages over voice systems. Braille teaches valuable literacy skills, such as learning correct spelling, learning how to locate a section of text on a page, and learning how to read one's own thoughts. In fact, a persuasive argument can be made that growing up without a system of reading and writing (such as braille) constitutes illiteracy.

As I have mentioned, computer driven brailled devices tend to carry a stiff price tag. Let me quickly review what is presently available. A braille printer costs around $15,000. I have heard of a new machine from Quebec for $7,000, and rumors of a European machine for $3,000. A braille printer operates just like a regular printer, except that it embosses paper instead of leaving ink on it.

Another type of braille output is paperless braille or electronic braille. These machines have a display of 20 or so braille characters which are driven by a computer. Instead of embossing paper, they move little pins up from a metal plate to simulate braille. The best known paperless brailler is the VersaBraille, made by Telesensory Systems, which costs $7,000. If you have access to one of these machines, you can accomplish a great deal with the Apple II computer. I have written programs to allow text to be entered into the Apple, which will generate a grade-two VersaBraille cassette. Or a blind person can write material in grade-two braille and produce a printout in regular text.

These programs are marketed under the name, BRAILLE-EDIT. A powerful word-processing system designed to meet many of the needs of the blind and those working with the blind, BRAILLE-EDIT can also function as a screen display word processor for sighted persons and a braille-oriented word-processor for brailled terminals. The program runs on the popular Apple II or Apple IIe computer. BRAILLE-EDIT is written in a combination of BASIC and assembly language for high levels of speed, flexibility, and ease of use. In fact, it is so flexible and it works with so many different devices that it is difficult to describe a typical application. There have been over sixty copies sold in the United States and around the world which are being used for a wide variety of purposes.

The BRAILLE-EDIT program for the Apple II (or Apple IIe) was written with the VersaBraille in mind. There are special programs in BRAILLE-EDIT that transfer chapters from the VersaBraille to the Apple, and from the Apple to the VersaBraille. Once a VersaBraille chapter is on the Apple, it can be translated, reformatted, edited, run through a voice synthesizer, or printed up.

As mentioned, the biggest barrier to using this technology is the availability of a suitable, low-cost braille output device. There are a number of other devices or approaches that can generate braille for less cash outlay. Some of these projects are not yet completed, and some require some further tinkering.

Tim Cramner of the Kentucky Bureau for the Blind has designed a modification for the manual Perkins braillewriter. You can get the plans for $10, and then you need about 40-80 hours of experienced technician time plus $600 worth of parts, in addition to the Perkins. I understand that this device will be made commercially by Maryland Computer Systems for under $3,000. This is an excellent design, making a full braille computer terminal.

Another approach is to utilize an old IBM braille typewriter and add about $700 worth of commercially available interface equipment. I have written the necessary software so the Apple can generate proper computer braille or grade two braille from such a combination. If you have an IBM typewriter lying around gathering dust, this is a worthwhile project.

An additional possibility is to make some very simple modifications to the Diablo printwheel printer to make it generate braille. I have modified Bob Stepp's software enabling the printer to generate proper braille. This approach is slow, generates poor quality dots, but is virtually free if you have a Diablo already connected to an Apple computer.

These different approaches are just now leaving the tinkering stage. I hope that this technology will soon be packaged so that individuals, agencies, businesses and schools can have cheaper access to computer-driven braille devices.

David Holladay, software specialist, operates the Raised Dot Computing firm located at 310 S. 7th Street, Lewisburg, PA 17837. (717/523-6739). Raised Dot Computing markets software for Braille production from the Apple II Computer as well as a variety of manuals and documentation. Raised Dot also publishes a monthly newsletter at a subscription rate of $12.00 a year for print and $20.00 on tape. VersaBraille tapes are available at $4.00 per issue. The newsletter will keep readers up to date on developments in the application of small computer technology to blindness.

BECOMING ACCESSIBLE TO VISUAL DISABILITY

By Jim Vagnoni

(continued from page 1)

Georgia, Maryland and Missouri programs began accepting blind applicants. One significant variance between these later programs (particularly among the ARPDP projects) was the application of speech technology from the outset of their training. This brief historical review serves only to give hint to steps that must be taken in order to accommodate a training facility for visually disabled students. The remainder of this article and others in this issue of VIEWPOINT hopefully will provide information and approaches to making training sites more accessible to visual disability. Much of the information will be of more use to facilities just beginning to serve trainees with visual impairments. Even so, we hope the articles will contain some information that will be helpful and useful to programs with extensive experience. This VIEWPOINT will lay a groundwork for increased dialogue as well as a springboard for the submission of articles to subsequent issues.

Four strategies that can make the task of accessibility easier and potentially more fruitful are (1) engaging in a Literature Review, (2) consulting Key Informants (3) securing the Testimony of Experts, and (4) conducting Surveys. A common method for beginning such a task is to conduct a **Literature Review**. A database such as NARIC or ERIC will generate some beginning references. Professional publications, particularly the Journal of Visual Impairment and Blindness will contain some articles. Although experience shows that the literature tends to create more questions than it answers, it provides a jumping off point by identifying individuals active in the particular area concerned.

The identification of knowledgeable persons leads to a second strategy, namely consultations with **Key Informants**. Investigators will find that interviews with key informants will yield significant and important details. Key informants can include and are not limited to: experienced blind programmers, persons experienced in the training of blind students, and visually disabled individuals who have recently completed training at a rehabilitation facility.

Obviously, investigators should keep records of all information as it builds. This collected data will give direction for other avenues of research. For example, investigators will soon be pointed to individuals who have studied the question of making computer training facilities accessible to blind persons in great detail. Thus, we are led to a third strategy, which is securing the **Testimony of Experts**. The primary difference between a key informant and a testimony of an expert is that the expert implies a detailed, studied, and thorough knowledge of a subject. For example, hardware experts might be called upon to evaluate the credibility of certain devices. Telecommunications experts can provide the critical intelligence regarding interfacing terminal devices with certain mainframes. Educators, psychologists, and social workers could be called upon regarding screening procedures for applicants and predictors of vocational success.

PROJECT—TO—PROJECT

Rather than recounting student statistics each issue, *Project to Project* will report alternately on the theme of the current issue as it applies to each individual member project. This *Project to Project* reports the results of a survey of devices and services provided by projects for their visually disabled students. Efforts were made to gather some historical data (i.e. time and numbers served) and to include non-ARPDP affiliated programs known to serve blind persons. Survey questionnaires were mailed last year. The information garnered was checked and updated shortly before publishing this issue (2/83). Not every project represented responded to every question.

The chart on the next page is self-explanatory and lists information by column. Services were coded to save space. The key to the codes appears in the right margin.

The next issue of VIEWPOINT will resume the regular updating of project status and activities.

(continued on page 10)

A final strategy to be noted here is the **Survey**. Surveys, of course, provide a broad picture and a consensus of opinion and knowledge regarding a specific subject. The comprehensiveness of a survey provides valuable insight, particularly for a beginning program. Surveys taken by ARPDP and reported in VIEWPOINT have included studies of selection criteria, (Volume 3, Number 1) and devices and services now being used (this issue) by training facilities serving the blind constituency. With the broad picture that a survey presents, a more informed decision can be made regarding aspects of accessibility to visual disability.

There are five primary areas in which these four strategies can be applied. First, of course, is selection and recruitment. For the most part, all the **selection criteria** that apply to sighted can likewise apply to those with visual disabilities. However, many facilities weigh subjective factors such as personal independence and motivation very heavily. For some time, projects have struggled with the question of assessment of programming aptitude of blind applicants. Some training centers have attempted to simulate the diagramming or flowcharting section of the SRA Computer Programmer Aptitude Battery either by creating raised line and brailled flowcharts or by translating the flowcharts into brailled pseudocode. Others have asked students to develop algorithms to solve mathematical problems. Finally, some training facilities and state rehabilitation agencies have strongly suggested that the training investment only be made with students who have proven potential, such as college graduates or persons with work histories in technical areas. Additional information regarding selection processes can be obtained employing the methods described above.

Recruitment methods do not vary according to disability, but certainly referral sources will. Naturally, State agencies serving blind persons and local and state

(continued on page 18)

PROJECT TO

PROJECT	YEARS TRAINING BLIND	#'s IN TRAINING	#'s GRADUATED	#'s PLACED
ALABAMA	Currently not training			
ARKANSAS ENTERPRISES FOR THE BLIND LITTLE ROCK, AK	4	35	—	approx. 80-85%
CENTER FOR INDEPENDENT LIVING BERKELEY, CA	8	3	20	16
DAYLE MACINTOSH CENTER GARDEN GROVE, CA	2	1	5	5
WESTSIDE CENTER FOR INDEPENDENT LIVING LOS ANGELES, CA	1	2	—	—
SYSTEMS DEVELOPMENT CORPORATION SANTA MONICA, CA	16	Statistics not available		—
DENVER COMMUNITY COLLEGE DENVER, CO	2	2	1	1
EASTER SEALS GOODWILL REHAB. CENTER NEW HAVEN, CT	Currently not training			
BIPED CORPORATION STAMFORD, CT	1	—	—	—
GOODWILL INDUSTRIES OF ATLANTA ATLANTA, GA	3	7	9	9
LIFT, INC. NORTH BROOK, ILL	Currently not training			
CROSSROADS REHABILITATION CENTER INDIANAPOLIS, IN	3	6	2	2

O PROJECT

EQUIPMENT USED	SERVICES OFFERED
LED 15, LED 120, TRS Model 3 w/speech synth., Apple II w/VersaBraille, Visualtek, CVS Visualtek, APH Tape Recorders, Optacon, Braille Writer	A,B,C,D, E,F,G
MCS Talking Terminal, Visualtek, Apollo, EVA, Perkins Braille Writer, Optacon, Talking Calculator, APH Tape Recorder, IBM Large Print Typewriter	A,B,C,E, F,G
Visualtek, Braille Typewriter	A,F,G
Versa Braille, Telesensory's Optacon	B,F
MCS Talking Terminal, Visualtek	
Visualtek, Telesensory's Optacon	A,B,D,F
Visualtek	——
MCS Talking Terminal, LED 120, Visualtek, APH Tape Recorder, Telesensory's Optacon, IBM Large Print Typewriter, Perkins Braille Writer	A,B,E
LED 120, FSST-3 Talking Terminal Visualtek, Optacon	A,C,F,G

KEY TO SERVICES

A Audio Tapes (Library)

B Braille Production (In House)

C Braille Production (Outside Service)

D Class Notetakers

E Social Services

F Readers

G Tutors

PROJECT TO

PROJECT	YEARS TRAINING BLIND	#'s IN TRAINING	#'s GRADUATED	#'s PLACED
LOUISIANA STATE UNIVERSITY BATON ROUGE, LA	Currently not training			
BANGOR COMMUNITY COLLEGE BANGOR, ME	5	3	6	5
MARYLAND REHABILITATION CENTER BALTIMORE, MD	5	5	9	8
STIRC PLAINWELL, MI	5	0	5	4
TODCOMP COLUMBIA, MO	3	2	5	4
BARUCH COLLEGE N.Y., N.Y.	5	Statistics not available		
HUMAN RESOURCES CENTER ALBERTSON, LONG ISLAND NEW YORK	Currently not training			
MEDCOMP RESEARCH FOUNDATION CINCINNATI, OH	17	—	approx. 90%	approx. 80%
CENTRAL OHIO REHAB. CENTER COLUMBUS, OH	—	0	2	—
PHYSICALLY HANDICAPPED TRAINING CENTER PHILA., PA	4	6	9	6
WODROW WILSON REHAB. CENTER FISHERVILLE, VA	—	3	1	1

PROJECT (continued)

EQUIPMENT USED	SERVICES OFFERED
MCS Talking Terminal, Ann Arbor 2x size Print Terminal	A,F
MCS Talking Terminal, LED 120, Visualtek, Kurzweil Reading Machine, Beamscope, APH Tape Recorder, IBM Typewriter	A,B,E,F,G
Typewriter Royal SE 5000C (IBM) Visualtek, Large Large Print CRT (Tel Ray) Photocopier	E,F
Visualtek, MCS Talking Terminal, LED 120 Kurzweil Reading Machine	A,B,D,F
MCS Talking Terminal and Braille Translator, Votrax Speech Synth., LED120, Visualtek, Braillex, Braillink, SAGEM, Apollo EVA, Optacon, Perkins Braille Writer	A,B,C,E,G
CROMEMCO-System 3, Optacon, Visualtek, Apple II with Speech Unit	A,B
Visualtek, MCS Talking Terminal	B
MCS Talking Terminal, Arts LPVT, Visualtek, Perkins Braille Writer, IBM Braille Typewriter, IBM Large Print Typewriter, Optacon, Photocopy Enlarger	A,B,E,F
MCS Talking Terminal, LED-120	B,E,F

KEY TO SERVICES

A Audio Visual (Library)

B Braille Production (In House)

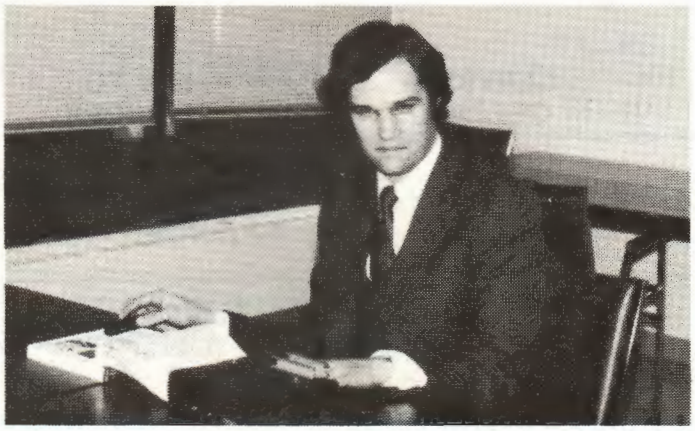
C Braille Production (Outside Service)

D Class Notetakers

E Social Services

F Readers

G Tutors



David Simpson Relies on Optacon for Quick Reading of Printed Materials

THE TRANSITION: FROM TRAINING TO WORK

by David Simpson

From time to time during my first nine months as a programmer at Bell of Pennsylvania, I have taken a retrospective view of my training at the ARPDP training center in Pennsylvania. In reflecting, I have asked myself these questions: in what ways and for what reasons have I modified the programming skills and tools which I first adopted in training; secondly, what have I learned from these changes that might benefit instructors and other students at similar training programs.

The ten months of training were a time for exploring concepts in electronic data processing and for learning structured programming, TSO, and COBOL. I needed but a few days to grasp the importance of preparing meticulously for daily instruction in these areas. Because of the demand for precision in syntax, spacing, and grammar in learning any programming language, I found it most helpful to copy from my taped textbooks large sections of COBOL examples which could serve as models for my own coding. I even went so far as to write out an entire program in Braille before keying it in at the terminal. Although this proved practical, and perhaps even necessary for the first few short programs, it later became obvious that with larger programs and a need for constant revision, keeping a braille copy of the entire source listing was so time-consuming that it reduced my efficiency. It was time to try a new way. For a while, I found no better approach; but when I discovered the virtues of a highspeed printer and rediscovered the value of the Optacon, I was able to overcome the problem. Why should I do all that rewriting in Braille when, with every run of a program, I could have an updated listing of my source code replete with diagnostic messages if desired? Why should I restrict myself to working at a terminal, when, if necessary, I could take my printout and my Optacon with me at the end of the day, work at home, and come back the next morning with a specific agenda of lines to be changed? The solution was amazingly simple and efficient.

My reason for recounting this experience is not to extoll the virtues of the Optacon, printer, Braille, or a particular method of studying (although these are vital), but rather, to emphasize how imperative it is that students be given a degree of freedom to test for themselves several combinations of skills and tools. Only in this way will they gain what is perhaps the most important skill of all, that of being their own best counselor and advocate.

Many of the techniques which I explored at the Training Center have been indispensable on the job; but the great volume of new material and the need to handle several responsibilities at one time have required me to be even more independent, resourceful, and responsible. In training, all of us worked on the same program at the same time and listened to the same lectures together. So, it was easy to ask someone else for help with a syntactical or logical error. But now, I sit with colleagues who are unfamiliar with my assignments and who have their own deadlines to meet. Also, at the Training Center, one could safely assume that any program which was assigned would only include material that had already been presented; in business, the need for a new program comes first and may necessitate more education.

For me, this is where the Optacon has been cruicial. I must glean small bits of information from a library of reference manuals and put them together to find solutions. No longer can I turn to the table of contents in a textbook feeling sure and happy that there is a chapter in bold letters promising step-by-step guidance and a pocketful of remedies. No more pre-recorded tapes with everything I need to know about VSAM but was afraid to ask. It's time to head to indexes and see where to go from there.

In sum, the rudiments of COBOL and JCL, proficiency in using special equipment and the value of interpersonal experiences have all proved vital in adapting to the work environment. But without patience and the continued willingness to combine these skills in new ways to arrive at creative solutions, I would not be able to succeed in my current position. No longer can I rely on someone else to give me a lot of answers; I must be willing to work alone, to use reference materials, to make mistakes, and to ask carefully-considered questions if I wish to continue growing and learning.

Let me suggest to those of you who are now enrolled in EDP programs that you take pride in your every accomplishment, no matter how small it may seem to you. Use the confidence you gain from your self-congratulations to nurture your self-reliance, resourcefulness and enthusiasm.

David Simpson left his doctoral studies at the University of Pennsylvania to participate in the Physically Handicapped Training Center's Computer Science Program and now is employed at Bell of Pennsylvania.

THE THREE WAY CIRCUIT: PROJECT, INDUSTRY, STUDENT STIRC, UPJOHN, RAHER

In the mid 1970's, a Bachelor's degree in the field of computers was a passkey to a good job in the burgeoning data processing industry. Coupled with a graduate degree in marketing from a reputable university like Michigan State, an undergraduate degree in Computer Science could be parlayed into a promising future in industry.

Yet this scenario did not play itself out for Dennis Raher. Despite his educational backround and academic credentials, Raher's diligent and extensive job search brought him only disappointment and frustration.

While Dennis' inability to land a job was extraordinarily uncommon among those who carry his academic credentials, his experience is commonplace with those who share his disability. Dennis is legally blind. In an occupational area like computer programming where visual capabilities seem so essential, employers have a difficult time imagining how blind persons can possibly work with computers.

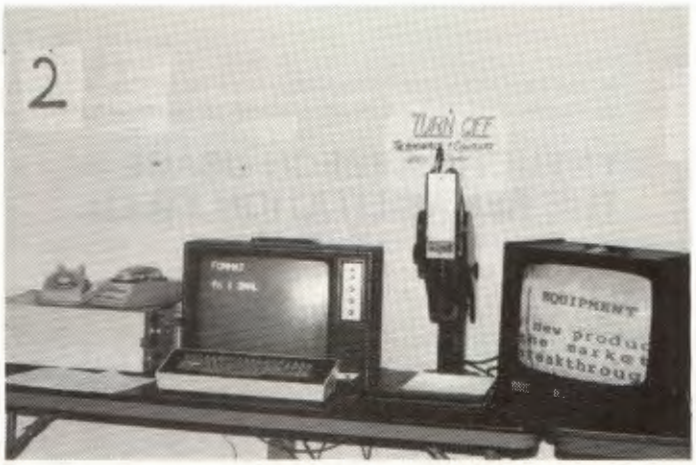
But Dennis Raher was not a quitter. He had challenged and overcome significant barriers throughout his life and believed that, given the chance, he could demonstrate his capabilities to any employer.

Dennis's opportunity presented itself when he became affiliated with the ARPDP project at the State Technical Institute and Rehabilitation Center in Plainwell, Michigan. The ARPDP Projects with Industry model relies heavily on the relationship between projects and the business community. Through this relationship, Dennis met Cyrus Highlander, a DP manager from the Upjohn Company's Information Systems and Computer Services Department. As a manager of the Michigan Business Advisory Board, Highlander got to know Raher's abilities and arranged for Dennis to serve his work experience internship at Upjohn.

This co-op position was all that Dennis needed. Before long Upjohn offered him a full time job as a development analyst in IS and CS, developing computer programs for different areas of the company. Last fall, Dennis celebrated his two year anniversary with Upjohn with a promotion to a management position.

At first Dennis' magnifying device was something of a novelty at Upjohn and people frequently came by to look at it and see how it worked. With the passing of time, coworkers have come to recognize that this equipment is no different than the other computer terminals in use in their office. Indeed, the passing of time brought the recognition that Dennis' blindness was not the primary impediment to his success in data processing. For talented and motivated persons like Dennis Raher, environmental barriers (e.g. technological access, employer prejudgement) were perhaps the most formidable hurdles.

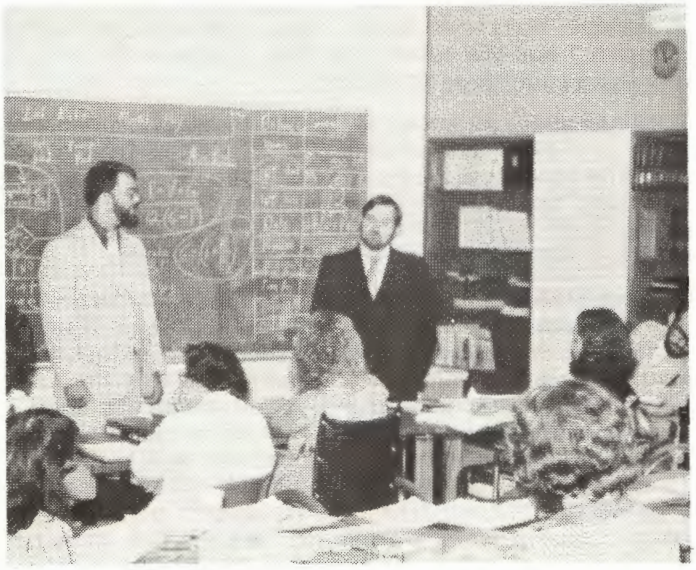
The value of the ARPDP model is no more clearly illustrated than in the case of Dennis Raher. Employing a computer analogy, the ARPDP model can be likened to a protocol converter which provides the critical interface between the host system — the employer — and the terminal — an efficient, fully functional (though slightly different) working unit, i.e. the handicapped job seeker. When carried out, this computer system analogy has several interesting parallels. Perhaps one of the more intriguing parallels is the notion that as the interface mechanism, ARPDP projects seek to have the host system perceive the working unit as no different from all other units.



Common work site for visually impaired users.

Of course, the most critical component of what is essentially a triangular relationship is the cooperative employer. The success of ARPDP projects can be directly attributed to the willingness of many major firms and organizations to involve themselves with project staff and students.

For Dennis Raher and others like him, the triadic circuit bridged a seemingly impossible interface. The ARPDP project in Michigan became the vital and facilitating link between a motivated and competent professional and a firm with the business savvy to focus on the individual's capabilities when assessing the potential contributions. For Dennis Raher the Upjohn Company is such a firm. Indeed, Dennis can be quoted as saying, "I can't imagine a better place to work."



Graduate Raher Returns to STIRC for Guest Lecture

SYNTHETIC SPEECH USAGE IN THE REHABILITATION FIELD

By John M. Williams

John M. Williams is a free lance writer commissioned at the behest of Maryland Computer Services. Mr. Williams has served as the Director of Communications for the American Coalition of Citizens with Disabilities.

In the ever changing world of technology, the number of products using synthetic speech has been rising rapidly in the past five years. There are talking computers, terminals, calculators, typewriters, voltage meters and scores of other talking products. Within the past three to five years, talking products, particularly microcomputers and terminals, have been gaining momentum in the rehabilitation field. They are being puchased by rehabilitation facilities from Maine to California.

"Helping disabled people become productive is the essence of rehabilitation," says Elmer Pelletier, 31, married, father of two children and former vice president of Ed Pelletier & Sons, in Madawaska, Maine. Until three years ago, he supervised the building and construction of roads in Arostock County until an accident caused his blindness.

He spent six months recuperating from the accident. Most of those months were spent at the Maine Medical Center in Bangor. "Nearly all my thoughts were centered on getting better so I could return to work. When I did, I realized I needed my sight to stay in the construction field. I knew I had to move into another field where I could use some type of aid to replace my vision, and yet give me the vision I needed. My vocational rehabilitation counselor suggested computer programming.

Sometime later, Pelletier found the ARPDP project at Bangor Community College. He learned Braille first. On this he says, "When I started job hunting, I discovered very quickly that knowing Braillle is not readily acceptable in today's job market. Interviewers kept asking me what other marketable skills I had. When I finally started my computer program, I had the added incentive to master the talking terminal as quickly as possible."

He has about six weeks left in this training program and plans to seek a job in or near Boston, MA. He feels confident that he will get a job and says, "The talking terminal I am using has given me the opportunity to start a new career. I am aware of the speech products being used by blind people and I know they are thankful for them."

South of Maine, in Philadelphia, can be found the University of Pennsylvania's Physically Handicapped Training Center. The Pennsylvania program sees a tremendous need for training and placement of blind students in the computer field and has been using speech terminals since it began accepting blind trainees more than three years ago. "Total Talk is a great communications tool," says Mr. James Vagnoni, Director of the Physically Handicapped Training Center. "Students use it for both personal and study purposes. They write letters and memos, generate assignments, write and debug programs, make mathematical calculations and do much more with the terminals." In addition to Total Talk, other aids used at the Center are a Braille printer and the Optacon. They also use readers and tape recorders.

"Synthetic speech used in computers is an innovative use of an extremely important technological advance. The first time I heard a talking terminal during a demonstration, I saw multiple benefits for the disabled user. I knew it would be extremely valuable for clients interested in working in computer related areas," says Billy Montgomery, Maryland Rehabilitation Center, Baltimore, Maryland.

The Maryland Rehabilitation Center has been using a talking terminal in its computer training program for more than 18 months. Six months ago, it purchased its own talking terminal called TOTAL TALK. Two blind students are using it five days a week, eight hours a day, during their nine month training program in computer programming.

The students enjoy using the terminal for a number of reasons. First, it enables them to have immediate feedback when they enter data into the host computer. "The synthetic voice is easy to understand," says one of the students. Second, it increases their confidence. "I wanted to be a computer programmer for years and did not know how I could reach that goal. Because of this talking terminal, I shall receive the training I need toward the first step of reaching my impossible dream," says the same student. Third, it increases their independence. Both feel that they can now do the same work as a sighted person who is studying the same program.

Ralph Bishop, area supervisor of Vocational Rehabilitation, for twenty Alabama counties, has been utilizing talking products in rehabilitation programs for four to five years. Shortly, blind and visually impaired clients will have a talking terminal to use at the rehabilitation facility in Talledega.

Bishop says, "Synthetic speech is a blessing to blind, visually impaired or speech impaired people. Placed in the proper hands and in the correct circumstances, talking computers, talking terminals, talking calcultors and other talking products provide the tools that can make a disabled person the equal of a non-disabled person when it comes to working. I am amazed by this technology and encourage other counselors to investigate ways it can be used to help their clients." Bishop is not alone in his praise of synthetic speech products. Other people in rehabilitation (administrators, counselors, computer programmers), who have seen it used, are pleased by the results and support its applications.

(continued on page 18)

(continued from page 7)

$6,500, and you don't even get a terminal!! Finally, the future of large print is not in cameras but in computers. No doubt Visual has a lot of CVS's around that they can't get rid of. What was it that P.T. Barnum once said?

Large Print Computer (LPC): It's nice to know that Visualtek recognizes that the future of large print computer terminal access rests in making a large print computer. The LPC is a 16K microcomputer which can be expanded with optional peripherals (both a strength and a weakness).

Strengths: The LPC produces incredibly crisp large print by digitizing characters. The terminal-micro computer has some of the standard large print features (different sizes, reverse image, etc.) and has an attractive and easy to use keyboard. In addition, the system (as a stand-alone) has a unique feature of allowing a user to view lines as they pass along the screen — the words move and not the user's eyes! The LPC has an expandable "mirror memory" (screen buffer) up to 4K (a "must" option), allowing the user to review 64 columns or 4096 characters. Also the LPC neatly interfaces with Visualtek's read/write systems (allowing for split screen viewing), thus one needs to purchase only one monitor.

Weaknesses: Unfortunately the LPC only works as a "dumb" terminal. By taking (almost) "off the shelf" Radio Shack TRS 80 Model I boards, intelligent terminal features seem far away (the TRS 80 itself has marginal terminal emulation abilities). We all know that terminal editing features are a must for persons with visual disabilities. Further, should you want to expand the LPC microcomputer into an adequate system you are locked into Visualtek and Radio Shack's products and prices — I wouldn't wish this on anybody. While the LPC has the important large print features, there are glaring omissions (such as no adjustment of line or character spacing). Further, I think that the engineers at Visualtek play too many video games. Joysticks, Paddles, and "the mouse" all have tremendous potential yet Visualtek has gone too far. Next to the LPC keyboard is a box with 14 switches (including the "home" key (why not on the keyboard?)), a joystick, and a dial — all of which seems to complicate matters. If you don't like the LPC box, Visualtek has some of these features (you guessed it) in pedals. Thrilling. The price of a LPC terminal microcomputer system (with read/write interface) is about $5,950.

Apollo Computer Interface (ACI): The ACI is Apollo's version of Visualtek's CVS — and it's just as bad (see CVS review above). The only reason I don't abuse the ACI here is because Apollo sales representatives had the common sense not to demonstrate this product for me.

Apollo Computer Terminal System (ACTS): Apollo introduced the ACTS two weeks after Visualtek's announcement of the LPC. The ACTS is not a large print expandable microcomputer *per se* but a dedicated large print *terminal*. Apollo's 'simple' intent is to develop and manufacture a versatile large print terminal with potential for a wide range of interfacing capabilities.

Strengths: Apollo won points from me by recognizing that their expertise is *not* in developing (or re-inventing) a microcomputer but in using microcomputer technology to develop a superior and many-featured large print *terminal* which could interface (at least as well as any other ASCII terminal) with a wide array of computers — from large mainframes down to inexpensive micros. (One can now buy a micro, without keyboard and display and *with* 64K CPU, floppy disk, operating system, BASIC, as well as word processing and spreadsheet software for under $1,200!). Considering the peculiar requirements of large print terminals and information access, interfacing to other systems is not as easy as it sounds (such as moving the cursor about a 'partial' large print screen while offering 'intelligent' terminal features). To meet the task Apollo selected a Digital microprocessor board as the foundation to its ACTS; the board is a little PDP-11, packed with 32K ROM and 14K RAM as well as Apollo's own proprietary circuitry. It uses what it has well. In addition to the common large print features (large characters, reverse video), there are 16 different sizes of letters available and both characters and lines can be spaced to user specification. The keyboard is easy to use and has a full range of function keys and specialty characters. An extremely important feature is the ACTS 8K screen buffer which allows a user to review 66 lines of 132 columns or 8712 characters. This buffer is the same size as a standard sheet of computer paper; using the ACTS monitor as a "window", workers can *easily* glimpse anything from test runs of completed jobs to spreadsheets. Apollo also integrates its terminal display with its read/write system. The most attractive aspect of the ACTS is not what it has but what it promises. While the model demonstrated was only a "dumb" terminal, I was *assured* that models soon to be released would have intelligent capabilities!!!

Weaknesses: The first drawback of the ACTS is the "promise" that it will soon be intelligent. Nonetheless, I have spoken with Apollo engineers and they seem both bright and sincere enough to come through. Not to mention that their existing hardware and software should easily lend itself to offering these features (they already have the full page buffer). Next, the system lacks the crisp output which is achieved by digitizing characters (even though their characters are good) as well as the feature whereby lines pass across the screen. The price is $6,450 for a terminal and read/write system.

Commentary:

SENSORY AIDS TECHNOLOGY UPDATE

The Sensory Aid Foundation of Palo Alto, CA is considering the publication of a monthly newsletter designed for rehabilitation professionals, employers, and disabled persons. SENSORY AIDS TECHNOLOGY UPDATE, will focus on advances in technology for hearing and visually impaired people and the practical application of that technology. The newsletter will have the potential for advising the public regarding new vocational applications of devices and new aids under development. Also, such a newsletter can serve as a form for exchange of information in solving technological problems. More information regarding this newsletter can be obtained from Sharon Conner, Editor, Sensory Aid Foundation, 399 Sherman Avenue, Palo Alto, CA 94306 (415-329-0430).

(continued from page 9)

associations for the blind are excellent contacts for securing applicants.

Given the rapidity with which technological advances are occurring, the recommendation for choosing **equipment** is that careful and ongoing investigation be the rule. Of course, when one makes an equipment purchase the expectation that the equipment will be shortly outmoded should be in mind. Careful review of devices including on-site demonstrations (including the hook-up to the host computer) and most critically discussions with users are essential to making wise purchases. A study of the facility could be made to remove obstacles and to identify a quiet place for review of audio tapes.

Consultation with most instructors training blind students will reveal that no really extraordinary **teaching techniques** are employed. Rather these instructors will advise investigators to be careful in their verbal references and to speak as graphically as possible. Instructors also advise their colleagues to be open to the needs of their blind students particularly when a request is made for clarification of a point that has essentially been described in visual terms. Some centers have developed the format of having weekly or semi-monthly meetings with their blind students to keep aware of any difficulties and to be certain that the course content is being conveyed.

Certain **supportive services** are required for serving a visually disabled student group. Among these are included sighted guide mobility training, reader services, braille and audio tape capabilities. Training facilities soon become aware of the importance of the quality of their audio tapes and plan in advance to take advantage of the services provided by Recordings for the Blind in N.Y.C.

Because many employers have a difficult time understanding how a blind person could perform the tasks of computer programming, **placement** becomes an even more difficult task. A training program becomes accessible to blind persons in the area of placement by paying strict attention to the development aspect of finding employment for handicapped persons. Presentations must be made to employers which illustrate the potential capabilities of blind persons. The placement process, of course, includes a job readiness component which must ensure that blind graduates are organized in their habits and neat in their appearance. Perhaps the most critical task of a job placement specialist is facilitating the accessibility of the work environment for a graduate. Cooperation between the firm, the training facility, and the state agency is a requirement in cases where potential interface difficulties exist between a device such as the talking terminal and a host computer.

Space, of course, does not allow for a detailed manual on site accessibility. However, in the editorial opinion of this writer, such detail is potentially more problematic than presenting a model (i.e. strategies to and areas of accessibility) for adapting a training environment to the needs of visually handicapped persons. The articles in this issue of VIEWPOINT present examples of the use of this model.

(continued from page 16)

Ronald Wilson, Director of TODCOMP, University of Missouri in Columbia, manages their computer training for visually impaired students. He sees talking products as having a distinct advantage over Braille printers. "Talking computers are faster, more practical and more economical than braille output. They are less expensive, provide immediate feedback, and in today's climate are more acceptable to an employer. I know employers who would rather invest in a talking computer to hire a blind person than a braille computer," says Wilson.

He cites law, medicine, teaching, library science, computer programming, engineering and counseling as fields that are wide open for blind people to enter provided they have knowledge of how to use either a talking terminal or computer. Wilson believes that as synthetic speech technology improves it will open up even greater opportunities. He sees the time coming when talking computers, terminals and other products will be standard equipment, and as such be a tool contributing to a social revolution within our country.

"Before synthetic speech there were limited career opportunities for both blind and visually impaired people. As a result, large numbers of them confined themselves to their homes becoming dependent. Synthetic speech reverses that trend. I see more blind people than ever apply for training, attending schools and working because of talking products."

So reports Earl Sheffield, a project head for Systems Development Corporation in Santa Monica, California. SDC began training blind students in computer programming sixteen years ago. Last year, SDC saw the need to add a speech terminal to its training environment. "The number of blind applicants rises each year. Unfortunately, we cannot accommodate all of them. Our program is supported by the state, and it is difficult to say no when the state asks us to train more. But we have to. Our blind students here go into good jobs in computer programming when they leave. They tell other students about the marvels of how talking products helped them, and the flood continues."

DANIEL D. McCRACKEN TO ADDRESS CONFERENCE

Daniel D. McCracken, renowned author of Programming textbooks will speak at the 5th Annual ARPDP Conference inLong Island. Mr. McCracken is currently a professor of Computer Science at City College of New York. Among Mr. McCracken's many works are included such *magna opera* as DIGITAL COMPUTER PROGRAMMING, the first textbook on programming; and, A GUIDE TO COBOL PROGRAMMING, for years, the bible of business applications programming. As a generation of children grew up on Dr. Spock, 2 generations of programmers reached maturity via McCracken.

Listen to information that was previously only available in printed form. With the INFORMATION THRU SPEECH computer system (ITS), any data stored in a computer is spoken to you, when you need it. So whether you are at school or on the job, ITS offers you a better way to obtain the information needed to work and learn independently.

ITS is a revolutionary system that lets you enjoy the benefits computers offer. On command, ITS converts any information stored in the computer into the spoken word in a clear, easy to understand voice. A voice that uses the same dependable speech technology as Speak Easy and Total Talk, the very successful MCS computer based terminals.

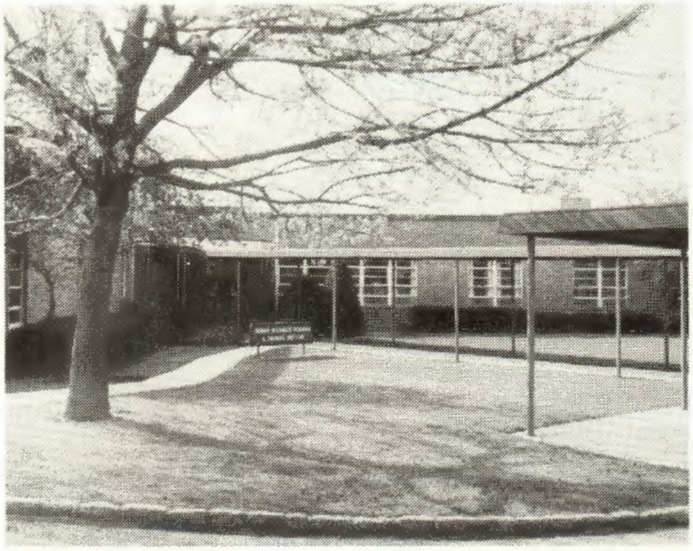
This new and affordable accessibility to information opens unlimited opportunities. Applications are numerous and varied. So call MCS to discuss your particular needs or to learn the way ITS is currently helping people to be more productive.

MARYLAND COMPUTER SERVICES INC

2010 Rock Spring Road
Forest Hill, Maryland 21050
(301) 879-3366

LONGING FOR LONG ISLAND; THE BIG APPLE BECKONS

No, this is not a song title. Rather this phrase expresses the eagerness ARPDP affiliates are expressing toward the impending *5th* National Conference. Traditionally these meetings have witnessed significant activity both in business accomplished at board and committee meetings and knowledge acquired through workshop participation and exchange of ideas. The New York location promises to draw a representative turnout not only because of the high level of airline traffic, but also the magic of America's most celebrated city, Albertson, L.I. (just kidding).



Human Resources Center, Albertson, Long Island

WORKSHOPS SET FOR MAY CONFERENCE

Conference coordinator Joe Trapp (National Bank of North America) and workshop coordinator Dave Dirks (Hayt, Hayt & Landau) announce that workshop topics have been finalized. Barring any last minute changes, the workshop listing is as follows:

Title	Facilitator(s)/Moderator(s)
Visually Impaired Programming Hardware and Their Uses	Jack Reed, Manufacturer's Hanover Trust Judy Gerber, Baruch College
Project NICHE - Moving Beyond Just Computer Programming	Bob Leneway, STIRC Jim Vagnoni, U. of Pennsylvania
Program Evaluation: A Plan for National Data Coordination	John Vafeas, U. of Pennsylvania
Director's Round Table	Ron Wilson, U. of Missouri Jim Vagnoni, U. of Pennsylvania
Advisory Committee Member/ Student Relationship	Harvey Karlin, 1st Penna Bank Laurie Kane, U. of Pennsylvania
Preparing Trainees for Placement	Lara Sessions, Robert Half,Associates
Creating DP Jobs in a Recessionary Job Market	Michelle Briggs, Robert Half, Associates
Adaptive Training Aids for the Severely Handicapped Trainee	Jerry Warren, Puget Sound Computer Programming Training
Panel: ARPDP Fund Raising & Public Relations	Bob Leneway, STIRC

VIEWPOINT/ARPDP
UNIVERSITY of PENNSYLVANIA
PHYSICALLY HANDICAPPED TRAINING CENTER
4025 CHESTNUT STREET/T7
PHILADELPHIA, PA 19104

IBM PROJECT TO TRAIN THE DISABLED

OCTOBER 1983

Legend:

- ○ Under Development
- ● Established

IBM-Initiated Programmer Training Projects -- October 1983

ALABAMA - Birmingham - (205) 939-6600

Mrs. Augusta Cash, Director
Lakeshore Rehabilitation Facility
3800 Ridgeway Drive
Birmingham, AL 35209

CALIFORNIA - Berkeley - (415) 849-2911

Ms. Joan Breves, Director
Center for Independent Living
2020 Milvia Street
Berkeley, CA 94704

CALIFORNIA - Los Angeles - (213) 670-4413

Mr. Jack Grubbs, Director
Westside Community for Independent Living
5760 West Arbor Vitae Street
Los Angeles, CA 90045

CALIFORNIA - Orange - (714) 385-1701

Mrs. Georganne Yarger, Director
Dayle McIntosh Center
2050 W. Chapman
Orange, CA 92668

COLORADO - Denver - (303) 629-3300

Ms. Lil Hunsaker, Director
Community College of Denver
1111 West Colfax, Box 400
Denver, CO 80204

CONNECTICUT - New Haven - (203) 389-4561

Mr. Mike Waller, Director
Easter Seal - Goodwill Industries Rehabilitation Center
20 Brookside Avenue
New Haven, CT 06515

CONNECTICUT - Stamford - (203) 324-3935

Mr. Joe LaMaine, Director
BIPED Corporation
c/o Easter Seal Rehabilitation Center
26 Palmer's Hill Road
Stamford, CT 06902

FLORIDA - Miami - (305) 871-6850

Mr. Bruce Cole
Vocational Rehabilitation
1150 S.W. 1st Street
Miami, FL 33130

FLORIDA, Orlando - (305) 299-5000 Ext.7238

Ms. Beverly Chapman, Director
Valencia Community College
P. O. Box 3028
Orlando, FL 32802

FLORIDA - Tampa Bay - (813) 531-7779

Mr. Craig Walton, Director
Abilities Rehabilitation Center
2735 Whitney Road
Clearwater, FL 33520

GEORGIA - Atlanta - (404) 894-3972

Ms. Joy Kniskern, Director
Goodwill Evaluation & Adjustment Center
2201 Glenwood Avenue, S.E.
Atlanta, GA 30316

INDIANA - Indianapolis - (317) 924-3251

Mr. Gregg Nussbaum, Director
Crossroads Rehabilitation Center
3242 Sutherland Avenue
Indianapolis, IN 46205

LOUISIANA - Baton Rouge - (504) 388-1965

Ms. Linda L. Holliday, Director
CRT Program
East 123 Pleasant Hall
Louisiana State University
Baton Rouge, LA 70803

MAINE - Bangor (207) 581-6121

Mr. Robert Cormier, Director
135 Eastport Hall
Bangor Community College
Bangor, ME 04401

MARYLAND - Baltimore - (301) 366-8800

Mr. Billy Montgomery, Director
Maryland Rehabilitation Center
2301 Argonne Drive
Baltimore, MD 21218

MICHIGAN - Plainwell - (616) 664-4461

Mr. Jim Moore, Director
State Technical Institute &
Rehabilitation Center
Plainwell, MI 49080

MISSOURI - Columbia - (314) 449-3481

Dr. Ronald S. Wilson, Director
Severely Handicapped Training Program
University Extension Division
University of Missouri - Columbia
Route 4, Box 199
Columbia, MO 65201

NEW JERSEY - Harrison - (201) 481-2300

Ms. Doreen Wirth Cevasco, Director
Goodwill Industries of New Jersey
400 Worthington Avenue
Harrison, NJ 07029

NEW YORK - Albertson - (516) 747-5400

Mr. Jim Diffley, Director
Human Resources Center
I. U. Willetts Road
Albertson, LI, NY 11507

NEW YORK - New York - (212) 677-7400

Mr. Mark Lasky, Director
United Cerebral Palsy
122 East 23rd Street
New York, NY 10010

NEW YORK - White Plains (914) 949-5656

Mr. Joe LaMaine, Director
BIPED Corporation
c/o The Burke Rehabilitation Center
785 Mamaroneck Avenue
White Plains, NY 10605

OHIO - Cincinnati - (513) 771-4800

Ms. Jo Ann Decker, Director
Goodwill Industries
10600 Springfield Pike
Cincinnati, OH 45215

OHIO - Columbus - (614) 294-5181

Mr. James Cunningham, Director
Computer Programmer Training
for the Disabled
CORC
1331 Edgehill Road
Columbus, OH 43212

OHIO - Kent - (216) 672-2755

Ms. Madeline Rosenschein, Director
College of Business
Kent State University
Kent, OH 44242

PENNSYLVANIA - Philadelphia - (215) 898-8108

Mr. James Vagnoni, Director
Computer Science Program
Physically Handicapped Training Center
4025 Chestnut Street, 3rd Floor
Philadelphia, PA 19104

VIRGINIA - Fishersville - (703) 885-9735

Mr. Wayne Olive, Director
Woodrow Wilson Rehabilitation Center
Fishersville, VA 22939

WASHINGTON - Seattle (206) 362-2273

Ms. Ruth Walsh, Director
Project Entry
Resource Center for the Handicapped
20150 45th Avenue, NE
Seattle, WA 98155

IBM-Initiated Programmer Training Projects (Pending) -- October 1983

HAWAII - Honolulu - (808) 548-4770

Mr. Tosio Nishioka, Director
Division of Vocation Rehabilitation
P. O. Box 339
Honolulu, HI 96809

PENNSYLVANIA - Pittsburgh - (412) 237-2618

Dr. Dan C. Przybylek
Dean of Continuing Education
Community College of Allegheny County
808 Ridge Avenue
Pittsburgh, PA 15212

UTAH - Salt Lake City - (801) 531-9310

Ms. Pat Latham, Director
Salt Lake Skills Center
431 South 600 East
Salt Lake City, UT 84102

IBM

FEDERAL SYSTEMS DIVISION

Computer Programmer Training for the Severely Physically Disabled

Report Period

1 January 1982 - 31 December 1982

Date

February 1983

CONTENTS

INTRODUCTION

IBM's Federal Systems Division (FSD) has been assisting state rehabilitation agencies to develop and maintain computer programmer training and placement programs for severely physically disabled persons since early 1972. Utilizing joint funding from IBM and an RSA Project with Industry (PWI) contract, we have helped to establish 22 operating programmer training programs geographically spread from Maine to Louisiana and Florida to Washington State. All of the programs have a common goal: to train qualified, severely physically disabled persons as computer programmers and to place those who successfully complete the training in non-subsidized, competitive programming positions.

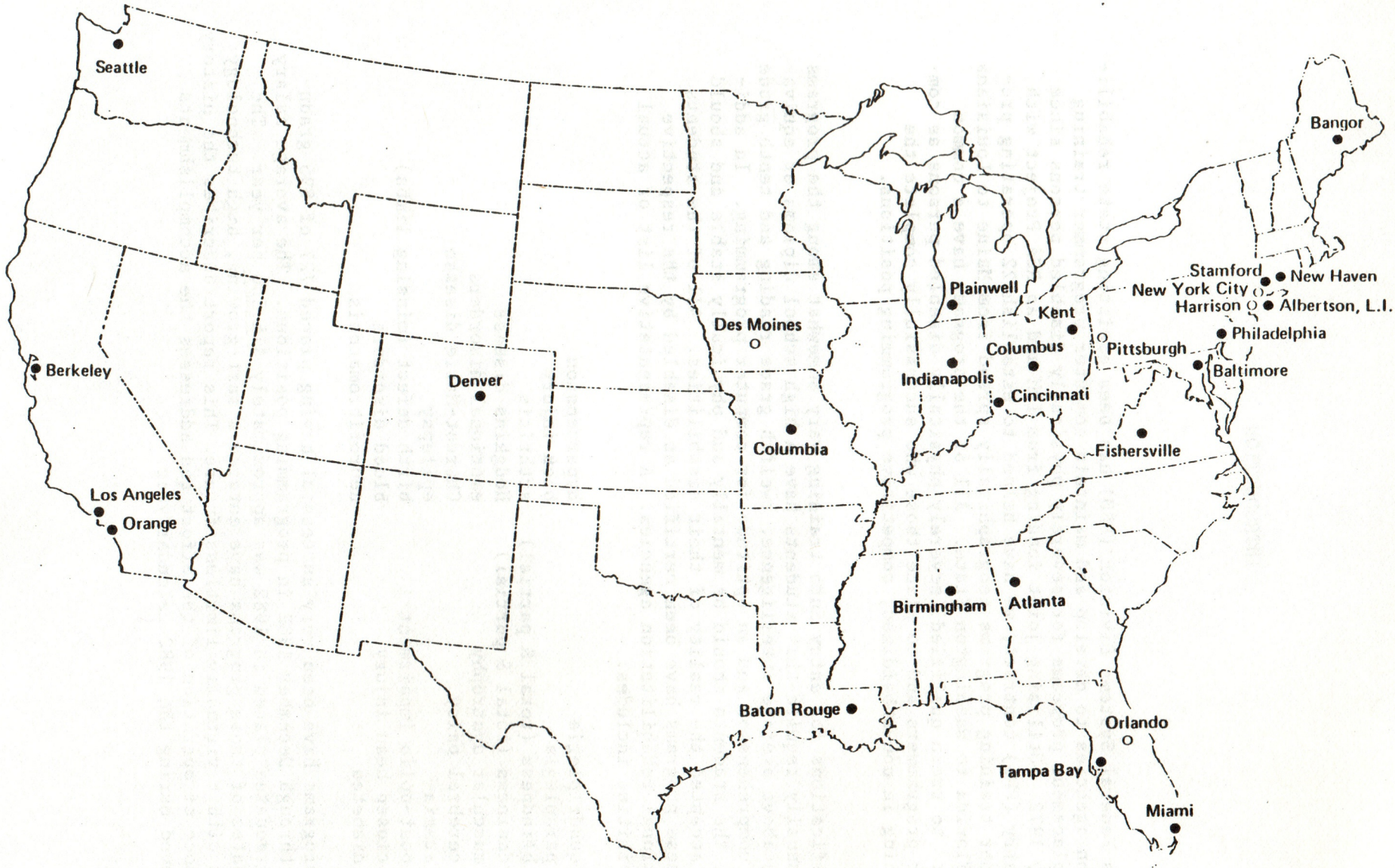
Qualifications for entry into training vary somewhat among the programs but usually require that students have a high school diploma or equivalent, above average intelligence, twelfth grade reading and tenth grade math comprehension and an aptitude for computer programming. In addition, the students should be mentally and physically stable and should have accepted the reality of their disabilities. All of the students in these programs have been certified as disabled by the respective vocational rehabilitation agencies. A representative list of actual disabilities includes:

quadriplegia	hypertension
paraplegia	back injury
blindness (total & partial)	arthritis
deafness (total & partial)	Hodgkins disease
muscular dystrophy	emotional disorders
cerebral palsy	Charcot-Marie disease
ataxia	epilepsy
post-polio impairment	birth defect (missing limbs)
closed head injury	blood disorders
diabetes	neurofibromatosis

The programs have been very successful having placed 727 of 895 graduates through December 1982 in programming positions. The average salary for graduates placed in 1982 was approximately $15,500 per year. The graduates of these programs have entered a fast-growing, high technology field with a virtually limitless future. This report describes the history and mode of operation of the effort and addresses the accomplishments achieved during the 1982 calendar year.

IBM PROJECT TO TRAIN THE DISABLED

January 1983



Section 1

OBJECTIVE AND HISTORY

The objective of the IBM Project to Train The Disabled is to establish, under the sponsorship of state rehabilitation agencies, self-sustaining programs to train and place severely physically disabled individuals as computer programmers.

This effort began in 1972 when a fully IBM-funded team worked with the Woodrow Wilson Rehabilitation Center (WWRC) in Virginia to establish the first operational program. This experience was particularly valuable to both WWRC and IBM in that each was able to gain an understanding of and appreciation for the problems and practices of the other. Work was begun with the California Department of Rehabilitation in 1974, and it was here that the model currently used in developing the programs was established.

Following completion of this first phase of the project, an arrangement for joint funding for continuation was agreed to between IBM and RSA. Under this joint funding, an additional 20 programs of this model have been established -- making a total of 22 through the end of 1982.

Section 2

THE MODEL

The IBM team has developed a model for program development and maintenance which is based on active and continuing cooperation among the vocational rehabilitation (VR) agency, the education and training community, and the business sector in each locality. Each of these community groups (rehabilitation, business, and training) performs a particular function in these programs.

Although the model is not rigid and the specific roles assumed by each group in any particular program may vary, historically the participants have assumed the following responsibilities:

a. The Rehabilitation Agency:

   1. Program funding
   2. Program management
   3. Training organization selection
   4. Recruitment and selection of students
   5. Student support services
   6. Job development and placement

b. The Business Advisory Council:

   1. Direction and guidance
   2. Prerequisite specification
   3. Training goals definition
   4. Review and approval of training course
   5. Technical training assistance (Guest instructors, field trips)
   6. Business readiness training assistance (e.g., job seeking skills)

b. The Business Advisory Council: (Cont)

7. Student/program evaluation and certification

8. Placement assistance.

c. The Training Facility:

1. Physical resources

2. Curriculum development (with BAC assistance)

3. Instruction

4. Student assessment

5. Placement consultation.

There are several elements of this model which should be stressed. First, the business involvement in each of these programs is frequent, active and directive. Each training program is designed specifically to meet the needs of the local business community, and the needs are defined by that business community operating as a Business Advisory Council (BAC) to the program. The BAC specifies prerequisites, identifies training objectives, helps design the curriculum, evaluates student and program progress on a scheduled basis, and assists directly in the placement of the successful graduates. In this way the BAC assures itself of the competence of the graduating programmers and develops a sense of awareness and proprietorship which virtually guaranties bona fide job offers for graduating students. Under the IBM model the business sector is directly involved in the program from initiation to graduation. Typically the full membership of the BAC meets monthly or bimonthly while the working subcommittees meet as frequently as needed, perhaps twice a month. In addition, individual members of the BAC are invited to the classroom as guest speakers and instructors -- sometimes as often as once per week. This deep business involvement in all aspects of each program provides entree for graduates into the professional data processing community.

Second, the local rehabilitation agency is responsible for the provision of support services to the programs and to the students. Such services include housing, (where needed), driver training, special devices and aids, physical and emotional therapy, and consultative services to business with regard to facilities modification and sensitivity training.

Finally, the training agency, working closely with the BAC, is able to provide occupationally-directed training which results in graduates who are almost immediately productive on the job. Many of the programs use an internship which puts the student at a business site for four to eight weeks in a working environment, thus preparing him for his coming employment. The training agents for these programs range from universities to independent rehabilitation centers, and the evaluative processes employed by the BAC assure training competence. So highly thought of is the training that several universities have begun to award college credit to the successful graduates.

Section 3

IBM ROLE

The IBM role in establishing these programs is to bring together the community resources and to help organize the program in a way that insures community interest and leadership sufficient to have a continuing program. IBM has a unique capability in this regard because of its position in the business and DP communities.

In this role IBM acts as the initiator and catalyst, molding and developing the program from community resources. Our objective is to establish local programs, under local leadership, directed toward local needs. In this consulting role the IBM team provides the experience and knowledge to bring the fledging program to maturity, but does not exercise direct control over its eventual administration.

In the process of applying this program model the IBM field team:

a. Selects new, potentially successful sites for the development of new programs.

b. Determines through personal contact the local rehabilitation agency's interest and enlists its support.

c. Assesses the community for program feasibility by:

   1. Interviewing and presenting the concept to members of the business, rehabilitation, and education communities and soliciting their participation.

   2. Determining via contacts within those communities the presence of qualified student candidates, job opportunities, and training resources.

d. Develops a plan for program initiation with the local rehabilitation agency which then provides overall direction, students, and support services to students and to the program.

e. Assists in defining the roles and responsibilities of the program participants: the rehabilitation agency, the Business Advisory Council, and the training facility.

f. Provides initial student training and selection criteria as previously conceived and employed in ongoing programs. (Rehabilitation specifies the disabilities to be considered and nominates the students.)

g. Arranges for visits to ongoing programs by key personnel from the new program.

h. Assists in arranging for the training by identifying and enlisting training organizations which will provide the instructors, facilities and training materials. The training may be conducted by a variety of organizations. In past programs this has included such organizations as: state operated vocational rehabilitation facilities such as the Woodrow Wilson Rehabilitation Center; universities and colleges such as the University of Pennsylvania; private non-profit organizations such as the Center for Independent Living; and private sector vocational rehabilitation facilities such as the Easter Seal - Goodwill Industries Center in New Haven, Connecticut. The exact nature of each training program is determined by the job skill requirements specified by the local data processing industry. IBM provides the stimulus for that specification process, and information from ongoing programs such as course outlines, bibliographies, course duration, organization, content, and methods.

i. Directs the organization of the Business Advisory Council by:

   1. Convening, with participation of the local rehabilitation agency, a meeting of all interested parties and assisting in obtaining a chairperson. As many as 52 business firms are represented in some program locations, including such major firms as Bank of America, Firemens Fund American, Lockheed, Del Monte, Honeywell, NCR Corporation and Borden, Incorporated.

   2. Presenting the organizational and functional concept of the advisory group and assisting the group in organizing to satisfy their responsibilities.

j. Provides continuing program support on a monitored and as-required basis to all facets of the program including placement.

k. Performs follow-up review and data gathering to support new programs and provides an information link among ongoing programs and between ongoing programs and new programs.

Thus the IBM/PWI project is a regenerative process, each year establishing new locally controlled programs dedicated to a single objective but based on techniques developed in previous programs. The programs themselves have formed a national Association of Rehabilitation Programs in Data Processing (ARPDP) to foster communication among existing programs and between existing programs and new programs.

Section 4

ACHIEVEMENTS

A. Project Activity

1. During this report period (1/82-12/82) two new programs have been initiated and are formally training students. They are:

   Tampa Bay, Florida -- Abilities Rehabilitation Center

   Miami, Florida -- C/SAIL

   In addition the Cincinnati program was moved to Ohio Valley Goodwill Industries.

2. Twenty-two (22) programs are now training disabled individuals to be computer programmers. (See Table 4-1.)

3. Four programs are in the planning stage. These are:

Orlando, Florida	New York, New York
Harrison, New Jersey	Pittsburgh, Pennsylvania

B. Results

A summary of the accomplishments of the Computer Programmer Training for the Severely Disabled Project from its inception through 1982 is presented in Table 4-2. As is shown in this table the first project started training in 1973 and graduated its first class of six students in 1974. Since that time there has been a continuing and accelerating increase in all measurables. For example, over the last three years the number of active projects has doubled (11 to 22), the total number of classes graduating has almost tripled (33 to 97) and both the total number of students graduated and the total number of graduates placed have more than tripled (248 to 895 and 221 to 727).

The yearly data does show some weakening in percent placed, which is of concern. The economic situation in the United States over the last year caused many companies to hire only essential people to fit specific needs. The demand for entry level programmers has been

Table 4-1. Rehabilitation Programs in Data Processing--Existing Programs

Alabama	--	Birmingham
California	--	Berkeley
	--	Orange
	--	Los Angeles
Colorado	--	Denver
Connecticut	--	New Haven
	--	Stamford
Florida	--	Tampa Bay
	--	Miami
Georgia	--	Atlanta
Indiana	--	Indianapolis
Louisiana	--	Baton Rouge
Maine	--	Bangor
Maryland	--	Baltimore
Michigan	--	Plainwell
Missouri	--	Columbia
New York	--	Albertson
Ohio	--	Cincinnati
	--	Columbus
	--	Kent
Pennsylvania	--	Philadelphia
Virginia	--	Fisherville

Table 4-2. Computer Programmer Training for the Severely Physically Disabled

DATA SUMMARY AS OF 12/31/82

	73	74	75	76	77	78	79	80	81	82
Totals Inception to Year-end										
Active Projects	1	1	2	5	7	9	11[2]	16	20	22
Classes Graduated	-	1	3	5	10	21	33	52	75	97
Graduates	-	6	20	38	74	146	248	442	660	895
Placements	-	6	20	36	69	131	221	395	582	727[4]
% Placed	-	100	100	95	93	90	89	89	88	81[4]
Data by Year										
New Projects	1	-	1	3	2	2	4	5	4	2[3]
Classes Graduated	-	1	2	2	5	11	12	19	23	22
Graduates	-	6	14	18	36	72	102	194	218	235
Placements[1]	-	6	14	16	33	62	90	174	187	145[4]
% Placed	-	100	100	89	92	86	88	90	86	62[4]

Notes:

1. Placements are shown in year graduated regardless of when the placement actually occurred.

2. Two projects, Boston, Mass. and Houston Tx ceased training in 1979.

3. The Cincinnati project ceased training at the University of Cincinnati in 1981 and was restablished at Ohio Valley Goodwill Industries in 1982, but is not considered a new project.

4. Anticipate eventual placement of 186 graduates from 1982 classes for a yearly percentage of 79% and an inception to year-end total of 768 placements (85%).

under pressure because of these hiring freezes and because of the availability of experienced programmers released by companies experiencing financial difficulties. Thus, only 62% of the 1982 graduates have been placed as of year-end. However, once these economic problems are resolved the growing unfilled need for programmers should result in job opportunities for the remaining graduates.

Although the placement picture for 1982 graduates should improve, a return to the 90% placement rate of past years for these graduates is not expected. Many of the ramaining 1982 graduates have been out of class for 6 months or more. Experience has shown that the longer the time without work, the lower the probability of finding work. The projections for the 1982 graduates have, therefore, been reduced to an expected placement rate of 79% (186 placements). This would make the absolute number of placements basically equal over the 1981 - 1982 period. With an improving economy in 1983, the placement rate should return to its pre-recession level of 85-90%.

This history of graduates and placements is presented graphically in Figure 4-1. This chart shows the benefit of establishing self-sustaining programs which continue to produce graduates and placements through the years as new programs are added. The result is continuing increase from year to year in the benefits derived from this program.

C. Earnings of Placed Graduates:

1. Estimated mean starting salary (1981) - $15,500.

2. Based on this $15.5K estimated starting salary, and considering probable support costs and tax payments, it may be expected that a typical graduate will repay his training and placement cost in approximately 59 weeks. Table 4-2 presents this cost/benefit estimate.

3. Assuming all 715 graduates placed are earning an average of $15,500 per year, the graduates will earn over $11 million in a 12 month period.

D. Business Involvement

The total BAC representation is well over 400 companies and 500 data processing professionals. The names of the companies represent a "who's who" of data processing manufacturers and users. Table 4-3 is a partial list of companies now serving on the BACs.

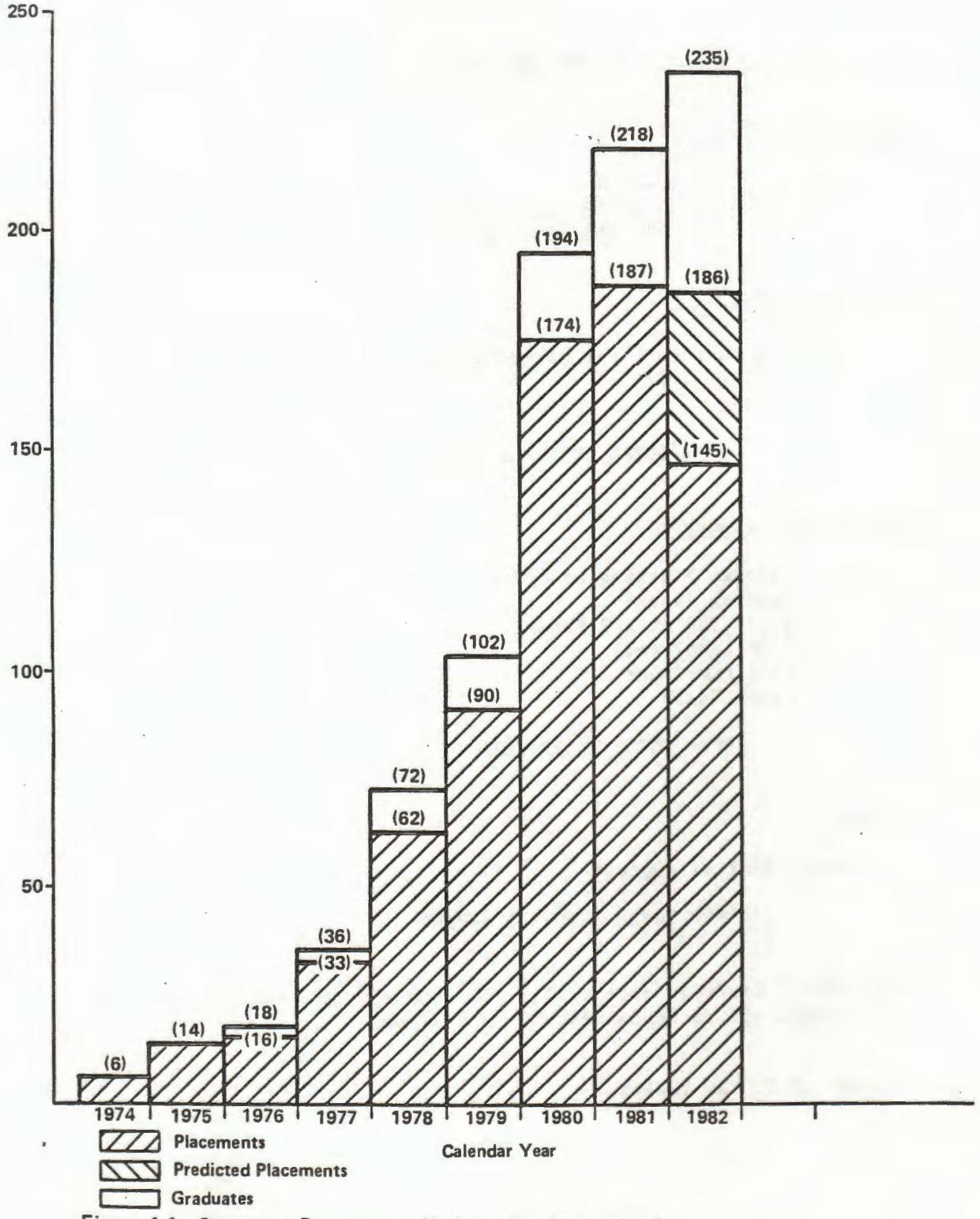


Figure 4-1. Computer Programmer Training for the Disabled–
Graduates and Placements

Table 4-2. Cost/Benefit Estimate (Based on 1982-83 Data)

Est. Cost of Support = $7,000 per year

Cost of Training

Avg. Cost Per Student	$ 7,000
Cost Per Graduate (33% Attrition)	$10,400
Cost Per Job (85% Placement)	$12,300

Cost Per Placement

Training (net cost per placed graduate)	$12,300	
RSA Funding of IBM	$ 714	
IBM Funding	$ 1,190	
**** TOTAL COST PER PLACEMENT		$14,204

Return Per Placement

Est. Average Starting Salary = $15,500		
Federal Taxes*	$ 2,500	
State Tax at 1/3 Federal	$ 850	
FICA (Employee)	$ 1,040	
FICA (Employer)	$ 1,040	
Sales Taxes	$ 140	
**** TOTAL TAXES PAID	$ 5,750	

Saving

Non-payment of support	$ 7,000	
**** TOTAL RETURN & SAVING		$12,570

At an annual recovery rate of $12,570, the $14,204 cost of training will be paid off in approximately 58.8 weeks.

*Source: U.S. Tax Tables

Table 4-3. Partial List of Companies Now Serving on Business Advisory Councils

IBM
Liberty National Life Insurance Company
South Central Bell Telephone Company
Lawrence-Livermore Laboratory
Ampex
Levi-Strauss
Hewlett-Packard
Memorex
Fireman's Fund Insurance Company
Wells Fargo Bank
Metropolitan Life Insurance Company
Lockheed Aircraft
Southern Pacific Railroad
Crown Zellerbach
Del Monte Corporation
Kaiser Foundation
Standard Oil of California
Pacific Telephone
Fairchild
SRI International
Bank of America
Ford Aerospace
TRW Systems
United Airlines
GE Credit Corporation
Yale University
Bunker-Ramo
American Can
American Chain & Cable Company
Perkin-Elmer
Sikorsky Aircraft
Emery Air Freight
Honeywell
Detroit Diesel Allison
Indiana Bell Telephone
Eli Lily & Company
Cummins Engine Company
Louisiana National Bank
Boise Cascade Paper Company
Bath Iron Works Corporation
L. L. Bean, Incorporated
Johns Hopkins University
Johns Hopkins APL
Foremost Insurance Company
Steelcase
Kellogg Corporation
Amway Corporation
Upjohn Company
Foremost-McKerson, Incorporated
Lear Siegler
State Farm Insurance Company
Digital Equipment Company
3-M Company
Doubleday
Merrill, Lynch and Company
Manufacturers Hanover Trust Company
Avis Company
Champion International
Amco, Incorporated
Proctor & Gamble
Battelle Memorial Institute
Consolidated Rail
Sperry-Univac
Colonial Pen Group Insurance
Westinghouse Electric Corporation
General Telephone (GTE)

E. The national Association of Rehabilitation Programs in Data Processing

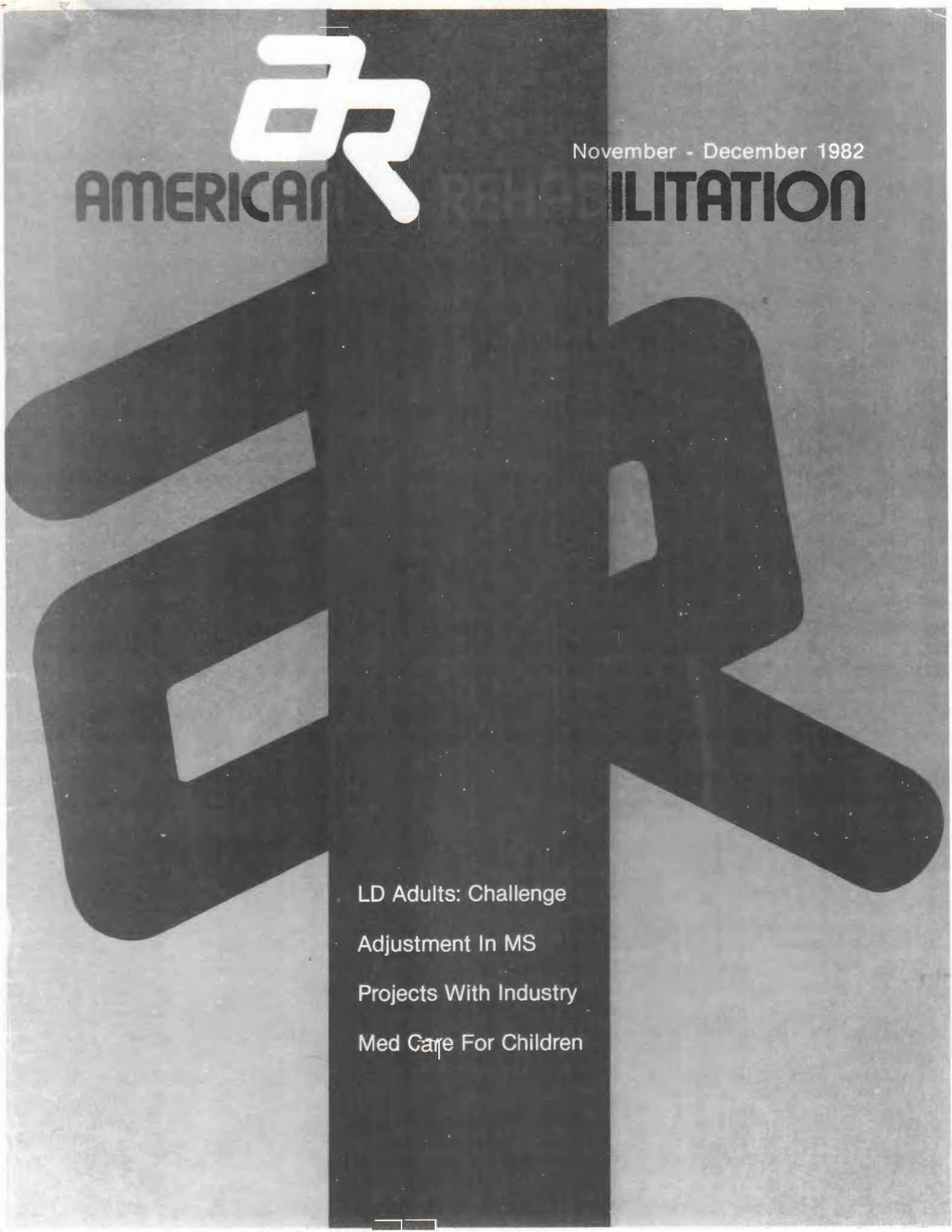
The ARPDP held its fourth annual convention in Atlanta in May 1982 and will hold its fifth in New York in May 1983.

F. Spin-Off Programs

Several of the locations managing computer programmer training projects have taken the IBM model and implemented additional training programs for the disabled as follows:

Columbus, Ohio	-	Data Entry Computer Operations
Indianapolis, Indiana	-	Word Processing Data Entry
Long Island, New York	-	Electronic Technician
Philadelphia, Pennsylvania	-	Computer Operations

The addition of these training programs permits acceptance of disabled individuals who would not be qualified to enter the programmer training classes. Placements from these spin-off programs, although a direct outgrowth of the programmer training model, are in addition to the programmer placement data provided in this section. This also shows the advantage of developing programs that are locally managed so that they can apply the model technique of the programmer training to other disciplines.


AMERICAN
ILITATION
November - December 1982
LD Adults: Challenge
Adjustment In MS
Projects With Industry
Med Care For Children

AMERICAN REHABILITATION

Volume 8, Number 2 The weakest ink is better than the strongest memory. **November-December 1982**

American Rehabilitation is the official, bimonthly publication of the Rehabilitation Services Administration. Use of funds for printing was approved by the Office of Management and Budget on June 23, 1975.

Opinions expressed are those of their authors and do not necessarily reflect the views of the Department and Agency.

Manuscript and article suggestions are welcome. Write to Editor, Rehabilitation Services Administration, 330 C Street S.W., Washington, D.C. 20201.

Paid subscriptions are accepted (see Cover IV for blank). Correspondence concerning paid subscriptions should be sent to Superintendent of Documents, P.O. Box 1533, Washington, D.C. 20402.

Projects With Industry: *The Concept And The Realization*

Irwin Kaplan and Norman Hammond

In the United States, the rehabilitation and reemployment in competitive positions of disabled people has often been unsuccessful because of one or more of the following:

- The job training given has not provided the skills actually needed by business. Rehabilitation clients have often been trained in outmoded skills.
- The rehabilitation counselors have not known how to approach business people and often look at the business person as an adversary.
- The rehabilitation counselors have not been trained in job placement. They don't know how to go about marketing their product — trained disabled people.
- The business person has not fully understood what is involved in bringing the disabled person into the work place, and, therefore, tends to act defensively — seeing only the negative aspects of having a disabled employee.

This paper describes an approach to rehabilitation that overcomes these problems, and describes one particular program that implements the approach.

The new approach is to develop a partnership of the business and rehabilitation communities to help meet their complementary needs — that of rehabilitation to obtain jobs for their disabled clients and of business to obtain qualified, well-trained employees. This partnership concept has been formalized under a Federal Government program called *Projects With Industry,* abbreviated as PWI. At this time there are about 100 PWI projects with over 5,000 business people participating as members of their Business Advisory Councils. There have been over 10,000 placements of disabled people into permanent jobs. PWI projects can be roughly categorized into these three models:

- The *Job Placement Model* seeks immediate, permanent, full time employment for already-qualified disabled people by matching their skills with the needs of local businesses.
- The *Work Adjustment Model* provides temporary work experience for disabled people that, in addition to providing opportunity to develop marketable skills, helps to develop those qualities of attitude and behavior that will be desirable in competitive employment.
- The *Skills Training Model* teaches work-ready disabled people technical skills needed to compete for higher paying jobs.

The common attribute of all of these models is the participation of business people who provide guidance and leadership to the rehabilitation agencies and disabled people. Another positive attribute to emphasis on job placement as the primary goal of the projects.

PWI is placing disabled people in *actual work settings* provides the best means of evaluating their work abilities; knowledgeable business people are used as a resource to identify available jobs, delineate job qualifications, and design training programs; and the *interaction* between business people and the disabled provides a worthwhile learning experience for each about the other.

During the 60-plus years that formal rehabilitation programs have been in existence, there have been many attempts by competent rehabilitation people to involve people with business experience in the rehabilitation process. Some have been very successful, but all have been limited in scope. The clients of that counselor or office have benefited, but the process has not been expanded and replicated.

There have also been a number of business-initiated efforts to place disabled people. Outstanding among these is a project started by the Florida Restaurant Owners' Association. Unlike most other efforts of this

sort, the Florida project was adapted by the Restaurant Owners' national trade association and has become nationwide in scope. It is now operated as a PWI, falling generally within the skills training model.

A formal PWI, as was stated earlier, is established as a partnership between business and rehabilitation. The prototype of such a partnership was created in the early 1970s when the IBM Corporation joined with the Rehabilitation Services Administration (RSA) (then of the Federal Department of Health, Education, and Welfare) and the then Department of Vocational Rehabilitation of the Commonwealth of Virginia to design, develop, and demonstrate for possible replication in other states a new joint training and placement project to benefit the most severely disabled people. These were envisaged as primarily the wheelchair-bound — quadriplegic, paraplegic, cerebral palsied, and advanced arthritic. With time and subsequent replication, however, the IBM-initiated projects have served persons with a broad spectrum of nonintellectual disabilities, including deafness and blindness.

Computer programing was selected as the vocation objective because it is a profession where intellectual capacity is more important than physical dexterity and mobility. Also, computer programing is ubiquitous; it is used by all industries in all locations. There is a continuing and growing need for computer programers in the United States. Computer programing is an excellent job for the severely disabled since it is a well-paying profession with significant growth opportunities. (A good salary is mandatory for a quadriplegic who has continuous medical requirements that can be extremely costly.) Finally of course, computer programing is a

As in any endeavor, practice makes perfect. Many keyboard hours are needed to master the art.

field that is quite familiar to IBM and is one with which we feel comfortable.

All of the projects which have sprung from this particular model share some common characteristics:

- They are sponsored, funded, and administered by local agencies. At the present time, these include state rehabilitation departments, independent rehabilitation facilities; community colleges; state universities; and, in one case, a private nonprofit corporation established specifically to support a training project.
- They are closely guided and controlled by a Council of Data Processing Managers and Programers who are the persons best qualified to prescribe and monitor the prerequisites for entry into training, the curriculum to be taught, and the training standards to be met.
- The responsibility for graduate placement is shared between the sponsoring agency and the Business Advisory Council (BAC) so that optimum placement is assured and that both parties remain deeply involved throughout the process.

After the demonstration project was established at Virginia's Woodrow Wilson Rehabilitation Center, a second project was started in California at the Center for Independent Living. It was at this San Francisco Bay Area project that the major advantages of a local BAC became evident; until then, it had been assumed that the IBM technical contribution would suffice. The capability and enthusiasm shown by the local business community made it clear that BAC was the way to go. This fitted in very well with the initial and continuing concept — to establish programs throughout the U.S. in such a way that these programs become self-sustaining under local control.

It was during the period of establishment of the California project that IBM was approached by Mr. Tom Fleming of RSA who proposed a continuing RSA/IBM partnership to ensure the propagation of this new concept. Under this partnership, the two projects initially started by IBM have grown to 20 projects distributed across the country. More are in process of development.

With succeeding projects came more lessons with resulting procedural changes. In 1976, a project was established within a university — the University of Pennsylvania in Philadelphia. This demonstrated that a third partner could not only contribute but could take a leadership role, still under the guidance of a concerned BAC.

Other projects have been established at the University of Missouri, at Louisiana State University, and at Kent State University in Ohio. Universities that have a strong contributing role include Yale in Connecticut, the University of Alabama at Birmingham, and the University of Maine. In Maine, the project is conducted by the Bangor Community College which is an element of the University of Maine at Orono. The Colorado project is conducted by the Community College of Denver.

Within the last 2 to 3 years, a new project has been developed which has some distinct differences in organization and support as compared to its predecessors. After the project run by Easter Seal-Goodwill Industries in New Haven, Connecticut had been in operation for several years in a very successful manner, some of the BAC members decided to incorporate separately and establish a new project in another city (Stamford) which would be controlled and supported directly by the business community. To this end, they obtained monetary contributions from potential employers of project graduates, hired the necessary staff, and rented space for training. There are those who predict that just this sort of direct business participation in the rehabilitation process will be necessary to compensate for the expected losses in government support.

In 1978, these IBM-initiated projects formed a national association — the Association of Rehabilitation Projects in Data Processing (ARP-DP). This association has incorporated and accepts for membership any nonprofit training organization whose objective is to train and place severely disabled people as computer programers.

Whereas, in the beginning, IBM's participation was quite comprehensive and in depth, its role now is primarily that of a catalyst. Help is provided at the start and to establish a working BAC, followed by only that subsequent help which is wanted and needed.

The first step is to explain the project's potential to the rehabilitation directors. If they wish to establish a project, and are prepared to support it financially, IBM then works with designated project directors to determine the best training locations, the training agencies, and initial project organizations. The project directors then initiate client surveys and recruitment efforts, while the IBM consultant makes the necessary contacts to establish embryo BACs.

With BAC establishment and its organization into committees, the real work begins. Usually a *Selection and Prerequisites Committee* begins immediately to survey the local data processing community to determine the locally acceptable criteria for student selection. Typically, such criteria include an above-average learning ability, high reading comprehension

Photos on this and page four are from the Projects With Industry project operated at the Long Island, N.Y., Abilities Center. Computer theory and operations are thoroughly discussed (above) in classroom (note interpreter for deaf students). Individual attention (right) irons out student problems, as is also the case on the actual console in the lower photo on page 4. Also on page 4 (top photo), not quadriplegic's (1st row, 2nd person) use of hand-held wands to work the computer console.

scores, and at least an average aptitude for programing — all measured by standard test instruments. Beyond that, in the individual case, they will wish to examine the type of disability, the demonstrated motivation of the potential student, and his recorded education level and record of performance. Some BAC selection committees participate in preselection interviews while others prefer to merely direct the process.

At the same time, the *Curriculum Committee* surveys the data processing community to determine the subject matter and the depth to which it must be taught to meet the local community's needs. These vary in detail because of differences in classes and manufacturers of computers among different areas. The curriculum typically fills a 9 to 10 month period made up of 6 to 8 hour working days and includes a 6 to 8 week period of internship during which the student actually works as a programer in a data processing department.

The early employment of an instructor allows him to work with the BAC committee in curriculum development. Usually about 6 to 9 months is spent in the preliminaries before training actually starts.

Another essential preparation element is communication with ongoing projects. The existing projects, individually and through ARPDP, are a source of invaluable information for the developing project. This communication is cultivated by the IBM consultant or liaison.

Once training is in process, another BAC committee becomes active — *Evaluation and/or Technical Review.* Through this committee, the BAC periodically meets with each student to become acquainted, review his academic progress, identify problem areas, and evaluate the curriculum and course as a whole. In addition to the very necessary evaluations already listed, this process provides other, even more valuable, benefits. It exposes the student repetitively to data processing people in a pseudo-management role; the course graduate learns how to present his work and how to answer questions. Even more significantly, the involved managers become comfortable with people with various disabilities; they begin to see the person, not the disability. The members of the evaluation team, having become familiar with certain students and their capabilities, are in a good position to evaluate students for employment in their own companies, can honestly write "business references" for the students, and, can make contacts and open doors leading to interviews and possible employment.

Toward the end of training, the BAC *Placement Committee* becomes more active since it must help train the students in job search and retention, help train the project director and rehabilitation counselors in placement techniques, and take specific action to aid in placement.

In an operating project, all functions are simultaneous. As one class begins, recruitment and selection for the next class starts. The curriculum is constantly reviewed to keep it in tune with local requirements and to ensure that the latest texts and techniques are used. Evaluation is ongoing. And the placement activity includes job development in advance of placement, and usually the recruitment of new BAC members to ensure broad community involvement.

The rehabilitation agency, usually through the project director, is responsible for the identification and provision of all necessary aids, assistance, and training (except for technical training) to ensure that the student at graduation will be ready and able to go to work, to meet normal work standards, and to compete on a realistic basis with the other programers. These aids and services may include work adjustment; training in the activities of daily living; purchase, modification, and training in the operation of a vehicle; the purchase of clothes. The project director is responsible to ensure that everything has been done at the proper time to meet the objective — a work-ready, technically-qualified graduate.

As of December 31, 1981, there were 20 projects of the sort described above. There are four more in some stage of development and two good prospects who had requested consideration. More than 650 new programers had graduated and more than 530 had already been placed in competitive, programer positions. History suggests that more than 550 of these graduates will have actually gone to work, since placement has consistently exceeded 85 percent.

With the increasing scarcity of federal funding, it will become progressively more important that the available funds be expended judiciously. Projects of this sort, although expensive to operate, are an excellent investment, since they result in a high placement rate and financial independence for the successful graduates; and they address the needs of our most severely physically disabled population. Even a rough balance sheet would show that much more money is saved than is spent.

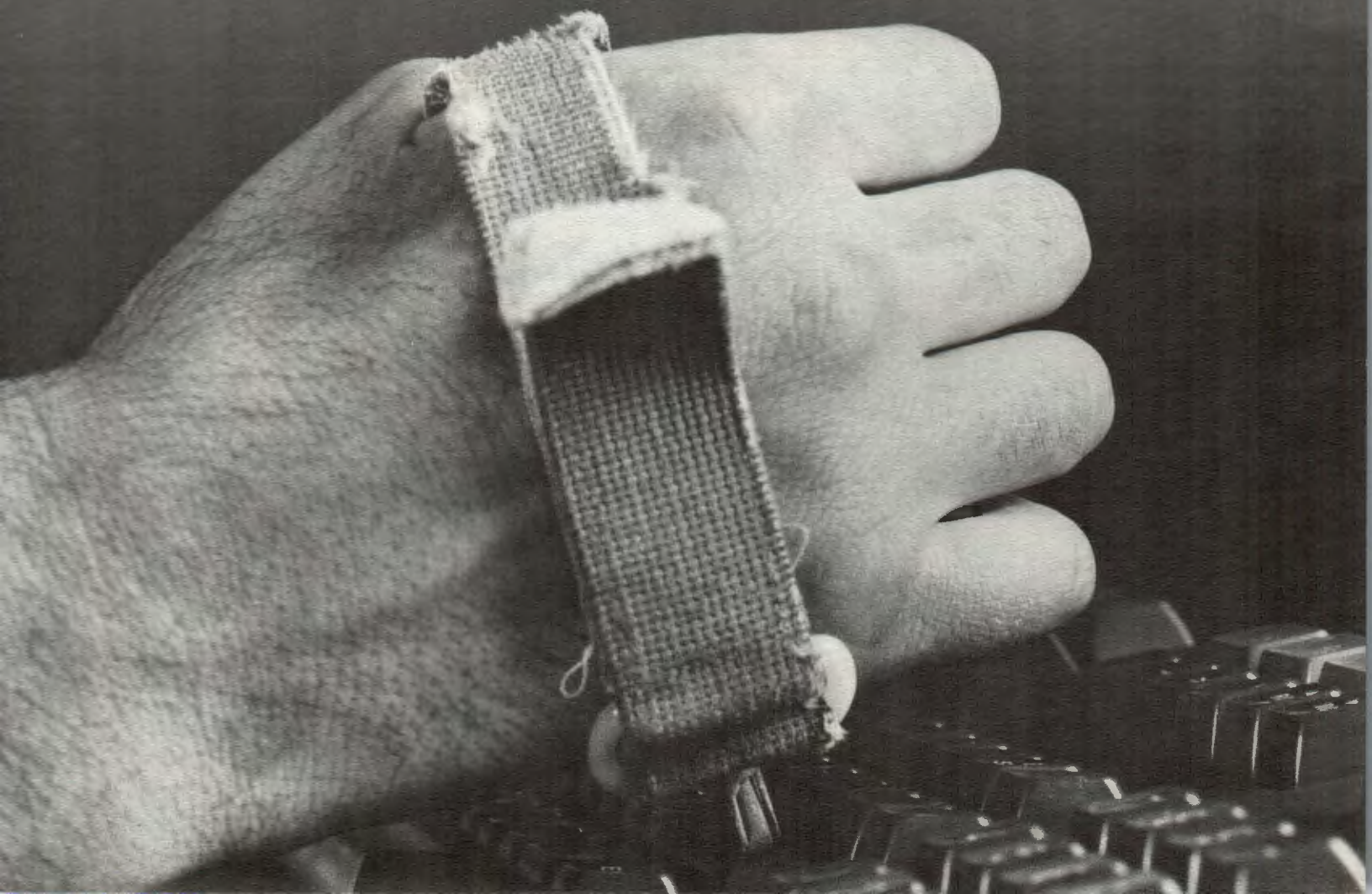
Mr. Kaplan is Manager of the IBM project to train disabled people and Mr. Hammond is a member of the consulting team. The paper is an updated version (through December 1981) of a presentation made at the First International Abilympic Seminar, Tokyo, in October 1981.

MEASURE

For the people of Hewlett-Packard

July-August 1983

Programmed for independence



PROGRAMMED FOR INDEPENDENCE

At first glance the school looks sparsely decorated: a couple of small rooms, four computer terminals, chairs, several tables and a printer.

The student body is scant, too: a dozen people and one teacher.

All of the students have serious physical disabilities such as blindness, spinal injuries and muscular dystrophy. All are equally serious about learning the one subject taught at the school: computer programming.

This Spartan setting has now provided HP with 10 entry-level, trained programmers who are working at a number of Bay Area divisions.

But HP's involvement with the Computer Training Program (CTP) in Berkeley, California, doesn't stop with the hiring process. People like Corporate Data Center user support manager Tess Pender have found a lot of personal satisfaction working with the program.

"A couple of years ago my supervisor, Bob Horenstein, information systems manager at Computer Systems Division, suggested I offer a CTP student a six-week work experience," she recalls. "Bob was one of the first people at HP to recognize the value of CTP's program, and he pushed us to get involved. I know I did. After I went to my intern's graduation ceremony I visited the school, and my involvement just grew from there. There's a saying around CTP that once you go there, you're hooked."

Hooked, indeed. Last May Tess received a special award from the school

Since he graduated from the Computer Training Program in Berkeley, California, HP's Jeff Breilh has been one of the program's biggest supporters.

PHOTO
JOANNE ENGELHARDT

MARK TUSCHMAN

Jane Sillman, a CTP graduate now at the Personal Office Computer Division, makes a lot of daily trips to pick up printout in the data processing bins.

JOANNE ENGELHARDT

Before a CTP student graduates, business people like Bank of America's Guy Bryon (left) and HP's Jerry Holloway (right) carefully examine a student's programming portfolio.

for the countless hours she has chalked up arranging internships for CTP students, getting job interviews at HP for new graduates and telling other companies about the program.

Bob Horenstein received that same award from CTP a few years ago. He, in turn, credits Royal Linden, project manager at the Manufacturing Productivity Division, with being "the first within HP to participate in CTP's program." Royal taught classes there and made a goal of spreading the word about the program throughout HP's Bay Area divisions.

CTP also gave Hewlett-Packard Company an award at the school's spring graduation. In the six years since HP hired its first CTP grad (Jerry Holloway, now a programmer/analyst in Corporate accounting systems), the company's involvement has mushroomed:

- 27 employees are active members of the school's Business Advisory Committees (BACs).
- 26 students served their six-week internships at HP.
- 10 graduates of the program have been hired by HP.
- The HP Company Foundation contributed three 125 personal computer systems to the school.
- The outstanding student of each CTP graduating class receives an HP 41C programmable handheld computer.

Corporate involvement by the likes of HP, Crocker Bank, Del Monte Corporation, Bank of America and others is why the program works. Says HP's Michael Ronstadt, who arranged for two CTP student internships at the Santa Rosa site, "The key to CTP's success is that industry is so involved—providing programming instruction, handling the mechanics of it and, of course, offering student internships."

One of the most involved employees at HP is Jeff Breilh, programmer/analyst in Corporate construction. Small wonder. Jeff became a paraplegic (which means he is paralyzed from the waist down) 10 years ago after a motorcycle crash. A member of CTP's second graduating class, he first went to work at Lockheed Missiles and Space Company for two years. Because he valued his CTP training, he also taught courses at the school while working full-time.

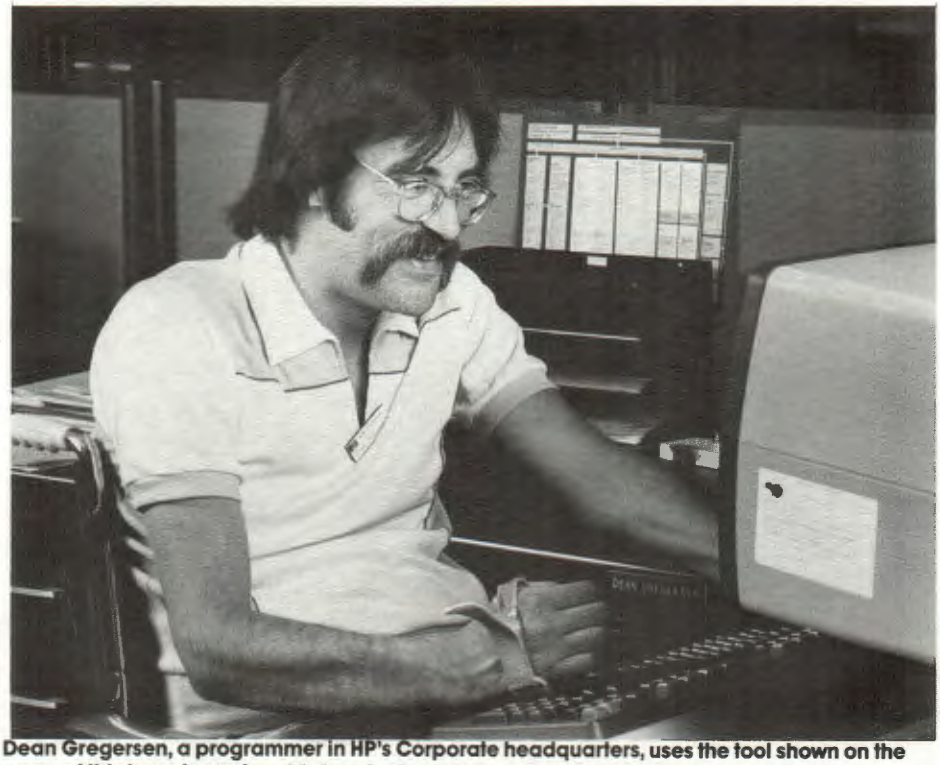
Later, when CTP offered him a job as director, he accepted and handled the administrative aspects of the school for two years.

"It was just as taxing to work there as it was to go to school there," recalls Jeff. "When I realized I was getting burned out, I started looking around for a good place to work. So many students had talked about HP that I decided to apply and was hired in April 1981."

But Jeff still puts a lot of his energy into supporting the school. Besides serving on the advisory committee, he returns to the school for technical reviews of prospective graduates.

Recently Jeff, Jerry, Leslie Winn (a programmer at Optoelectronics Divi-

INDEPENDENCE



MARK TUSCHMAN

Dean Gregersen, a programmer in HP's Corporate headquarters, uses the tool shown on the cover of this issue to work on his terminal.

sion and a CTP grad) and Randy Roten (production support supervisor in the Corporate Data Center) joined programming people from other corporations to review the technical competence of the school's current crop of students.

It's difficult to judge whether a person is ready for the business world, but Jeff feels strongly that to maintain the school's reputation, students who need more training should not graduate. "If people are not quite ready, then it's better to give them other programming assignments or make them repeat a class before sending them out to get a job," says Jeff.

Even with the school's reputation, new graduates are finding it tougher now to find a job. "At one time 100 percent of each class was employed within a few months," says Tess. "Now the school has about a 40 percent placement rate."

She attributes the dramatic drop to the overall economic downturn. But Tess believes that if more companies knew about the training the school offers, that percentage would rise.

"The most valuable thing I learned at CTP was a structured approach to designing and writing COBOL programs," says Dean Gregersen, a 1979 CTP graduate who served his internship in Corporate manufacturing information systems—and was hired to work there immediately after graduation.

"The program's focus is on application programming and that's what I'm doing at HP."

"I think HP hired me because of the special computer background that the school provided," Dean adds. "The practical experience I got at the school was a valuable aid to me."

A former machinist, Dean's spinal-cord injury was the result of a car accident. Although he had a mild interest in accounting, he thought data processing would be boring. "Jerry Holloway is a friend of mine; he seemed to like programming, so I decided to try it." Jeff Breilh was Dean's instructor at the school.

Other CTP grads at HP have similar stories to tell. Jane Sillman completed her internship at HP, graduated in September 1980 and joined HP's corporate staff to provide applications support. She's now working at the Personal Office Computer Division in order processing information systems.

"When a person suddenly finds herself propelled into a totally different lifestyle, it's nice to know there is something like CTP to fall back on."

A car accident also altered Jane's career. Before she was injured, she ran an offset printing press, but afterwards she realized she needed a less "mobile" occupation. Today she can walk with short leg braces and a cane.

Laura Lockhart, a 1980 CTP grad, has found her blindness a nuisance rather than an impediment in her application programming job at Optoelectronics Division. About eight years ago Laura's eyesight began to deteriorate due to diabetes. Extensive laser treatments failed to restore her sight. Although she had credentials to teach mentally retarded children, Laura decided she needed to find a career in which her disability would be minimized.

"I had always enjoyed math and science in school and found I got the same enjoyment from pulling a program together," she says.

As with many other CTP graduates, Laura feels she owes a debt of gratitude to the tiny school that provided her with a new livelihood. She often tries to find housing for CTP interns who are working on the San Francisco Penin-

sula and she counsels students as well. "I find that students look to us in the working world as role models," she points out. "We give them hope that they, too, can make it if they only persevere." Laura is helping start a South Bay alumni group of CTP graduates.

Several more CTP graduates work at HP: Joe Pattin, who works with Jane in Sunnyvale; Ainsley Neis at Corporate; and Mary Fowler, a recent HP hire now working in the Corporate Data Center.

Though the program is worthwhile, HP doesn't support it solely out of a sense of altruism. "It's clearly a good affirmative action program to support," says Sylvia Gerst, manager of HP's affirmative action program. "But it's also smart business for the company to hire physically disabled people because they have a turnover rate less than half the national average for programmers and analysts."

There's another reason to support a program like CTP. John Velton of the California Department of Rehabilitation points out the financial advantages to the state and to taxpayers: "The program is meant for severely physically disabled people, most of whom receive money from the state. But after taking the computer training and getting a job, these same people become tax*payers* rather than *receivers*."

This year the state of California contributed $249,000 to CTP, and another $30,000 came from private contributions.

The school uses the limited funds to pay staff salaries, purchase equipment, pay the rent and utilities, and buy supplies. It's little wonder that the school is sparsely decorated.

The school may not be much to look at, but, as one student says, "When you come here, you're glad you did." **M**

PERRY SMALL

Tony Adams, a paraplegic now enrolled in the Computer Training Program, is learning to program with the aid of an HP 125 at the school.

PROGRAMMER PROGRAMS

A number of U.S. cities have programs much like the Berkeley, California, Computer Training Program. Most are funded by state rehabilitation departments and agencies like Goodwill Industries.

The Association of Rehabilitation Programs in Data Processing (ARPDP), a non-profit organization that promotes the hiring of disabled programmers, sanctions those programs which meet their standards for student selection and training.

In Atlanta, Georgia, for instance, the Southern Sales Region last year hired Ray Ganssle as a programmer. Ray, a paraplegic with limited use of his hands, had just graduated from a 10-month programming course at the Georgia Institute of Technology.

"Ray's worked out just super," says Joli Hearn, from SSR's personnel department. "He's doing a good job for us."

Similar programs for disabled people can be found in New York City; Cincinnati and Columbus, Ohio; Philadelphia, Pennsylvania; and Birmingham, Alabama. For more information, contact ARPDP at the Physically Handicapped Training Center, University of Pennsylvania, 4025 Chestnut Street, 3rd Floor/T7, Philadelphia, PA 19104.

QUEST

JUNE, 1983

TAS Tackles Trouble

Page 4

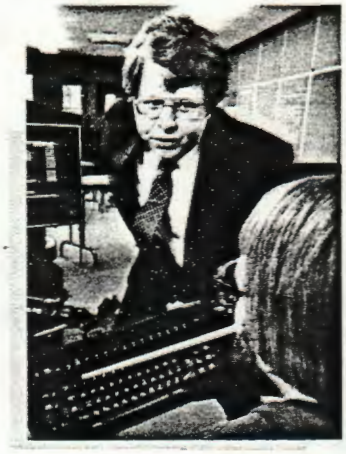
QUEST

Published monthly for the people of the GTE TELOPS IM community.

Volume One, Number One June, 1983

4
TAS up to the task

8
Disabled? No Way



18
On line with MSOS

Front Cover: On the screen, a California storm photo superimposed on GTEDSer Peggy Sweeney's terminal. Composite picture includes photo by World Wide Photos, Inc.

Back Cover: Jonathon Riggs, Seattle programming student, visits GTEDS-Everett.

Published by GTE Data Services Incorporated, Communications Department, 111 Madison Street, Tampa, Florida 33601

Ted Dahl, Director of Communications
Tony Clinger, Communications Manager
Sallie McLaughlin, Communications Assistant

"An Equal Opportunity Employer"

Controlling the keyboard with a mouthstick, quadriplegic Jeff Doran shares his enthusiasm for Seattle's programmer training program with Northwest IM people Shirley Hansen and Bob Halford (r).

From Seattle to Clearwater

They're taking the 'dis' out of disabled

Clearwater student Roger Cornelius programs his thoughts.

In a portable classroom nestled in Clearwater, Fla., near Tampa, Tony Barney sits at a computer terminal. With pencil in hand, he contemplates his next move on the keyboard.

Standing at a printer nearby, Donna Branda anxiously reviews the results of her program as it unfolds from the machine.

Across the room, Joe McDermott reads the latest issue of *Computerworld.* His concentration is so intense that he is seemingly unaware of the twenty-one other computer programming students who surround him.

Across the country in Seattle, Washington, near Everett, the scene is similar. There, Jonathan Riggs listens closely as the instructor reviews COBOL applications with a group of nineteen students.

The students in these two widely separated classes have a mutual interest in computer programming. But that is not all they share. All forty of them, whose ages range from nineteen to fifty-two, have above average intelligence. They're dedicated. They're motivated. They're physically disabled. And they all have support from community and business organizations — including GTE TELOPS IM people Dave Castel, Harry Barker, Floyd Kinsman, Bob Halford and more.

This support is what made Clearwater student Juanita Thrasher a bit jittery one day in March. After taking just three months of her computer training course, it was time to be evaluated.

"Many local organizations have put time and money into this class," says Juanita. "It's important that we show them we're learning, and learning a lot. Our future as

Student Mary Ann Osborne, takes time out from touring the Everett Data Center for a talk with IM Services Director Doug Watkins.

programmers depends on it; the people evaluating us are members of the business community — potential employers. What's more, our performance could make or break the opportunity for others to participate in this program.

Both nine-month programmer training programs are the newest of twenty-four similar nationwide programs. So new, in fact, that Jonathan, Juanita, and the others will be the first to graduate. When they do, they'll have Burton Peck to thank.

Some years ago, Burton, an IBM executive, was stricken with Guilain-Barre Syndrome. The illness left him paralyzed — a quadriplegic. Shortly after returning to his job managing an IBM computer programming staff, Burton found that by using a mouth stick, he was able to depress the keys on the keyboard. If *he* could do it, others in his physical condition could, too. Wanting to share his good news with other physically disabled people, Burton approached IBM for help.

A keyboard mounted on a tripod gives student Jeff Doran (r) easy access to the computer. As for the mouthstick, GTNW's Bob Halford is working to provide Jeff and other quadriplegics with more efficient ways to trigger the keys.

Student Don Croswell (l) gets an insight into operations from Everett's Bill Seling.

Now, twenty-four programs later, IBM's original concept is going strong. In each program, that strength comes from IBM, the community agency that volunteers to sponsor the program, and from a Business Advisory Council. Consisting of volunteers from local DP-oriented firms, these councils provide advice to the agencies on curriculum development. They help acquire equipment, training materials, computer time, and money to help defray program expenses, the core of which is usually provided by government funding. Additionally, the council members help arrange two-month student internships with local DP companies and much more.

Backing from this council is what makes the program unique, according to Bill Sandonato Jr., President of Abilities, Inc. of Florida Rehabilitation Center, the training facility where the Clearwater programmer training course is based.

The programming courses are intense. They run eight hours per day, five days per

GTEDSer Shirley Hansen talks with students about the Network Control Center.

week and pack the technical subject matter from two years of technical school or university studies into less than one. "Because they are designed by DP professionals working in the field, each program is tough and tailor-made to meet the needs of the community in which it is located," says Bill Sandonato. This is what gives program graduates a slight edge. Specifically, highly-marketable skills." Of the nearly one-thousand students who have graduated from programs such as the ones in Clearwater and Seattle, Bill says that over eighty-one percent have secured jobs.

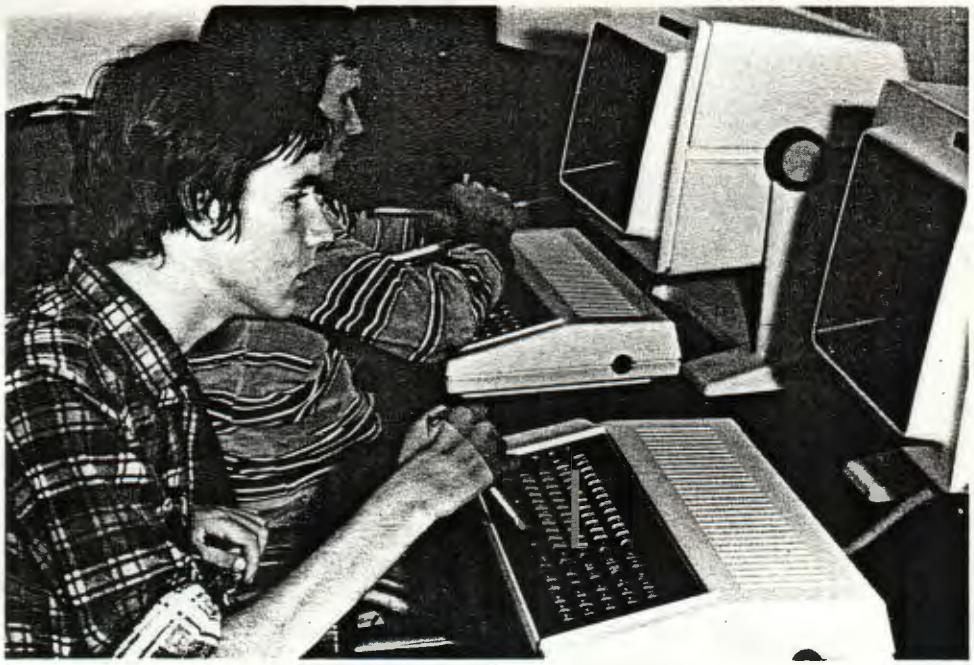
When twenty-four-year-old Tony Barney graduates from the Clearwater program this October, he hopes to be included in that percentage. The chance to be independent of public support and to have a rewarding career means a lot to him. Three years ago, an automobile accident left Tony without use of his legs and with limited use of his arms. Tony's needs — including a van customized with a wheelchair lift — do not come cheap.

Bill Sandonato knows that. He also knows that a career in computer programming would offer Tony and others like him a bigger slice of the good life. That's why he approached President Don Peeples and members of GTEDS' Executive Staff in Tampa early last year. He asked them to support the Clearwater program, which at that time was just getting started.

After the meeting, Bill received the good news. GTEDS would supply some financial assistance and all computer power needed for the program. "GTEDS' enthusiastic response got our program off the ground," recalls Bill. But, the company's contributions did not end there.

Dave Castel, a member of GTEDS' Information Sciences staff, joined the program's Business Advisory Council. "As head of the Equipment Committee, Dave was instrumental in obtaining our equipment at no charge," says Bill. "Getting the equipment resources together took some time. GTEDS is providing the computing facilities, Memorex the terminals and Paradyne the modems . . . all free," added Dave. "The Tampa data processing community was outstanding! I had offers of five computers and over one-hundred terminals before we set the final configuration." In addition to obtaining equipment, Dave also gets involved with the class, speaking to students on future technologies.

GTEDSer Harry Barker is also involved in the program. Working with vendors and other GTEDS employees, Harry secured



In Florida, an intense afternoon of applications for Doug Wagner.

cable connections to link the terminals to the Tampa Data Center. He also provides technical advice. Recently, when student Beverly Brooks had her legs amputated, Harry helped obtain and connect a portable terminal so Beverly could stay on top of her studies while recuperating at Morton Plant Hospital.

At Seattle's Resource Center for the Handicapped, General Telephone Company of the Northwest (GTNW) employees are also giving the program their support. Involvement began with a three-thousand dollar donation, and Floyd Kinsman, Director-IM, volunteered to serve on the program's Business Advisory Council. Serving on the Curriculum Committee, Floyd assisted in designing the course, interviewing the potential students and selecting the final nineteen. But there is more. According to Ruth Walsh, Programmer Training Director at the center, "Floyd doesn't limit himself to the curriculum area. He helps to acquire equipment and to evaluate the students' performances.

Right now, Jeff Doran, a quadriplegic, uses an unsharpened pencil controlled by his mouth to access the terminal's keyboard. Bob Halford, GTNW's Data Operations Supervisor, hopes to change that. Currently, Bob, together with members of the Seattle program's Equipment Selection Committee, is researching more effective and comfortable methods for disabled students to access keyboards.

Tony, Donna, Joe, Juanita, Jonathan, and the other programmer training students are eager to get jobs. They know that a paycheck and a challenging career is riding on their studies. So back in the classroom, there are more programs to code. More books to crack. More late night study sessions. More hope. More enthusiasm. More drive. More ambition.

More than words can say.

Tampa's Dave Castel brings the concept of data base to Clearwater students.

Disabled? No Way

Page 8

GTE

GTE Data Services
111 Madison Street
Tampa, Florida 33602