REGIONAL WINNING ENTRIES IN THE JOHNS HOPKINS FIRST NATIONAL SEARCH ON PERSONAL COMPUTING TO AID THE HANDICAPPED

HEARING, SPEECH, AND LANGUAGE

Computer-Assisted Transcription System
Robert K. Binford

The Computer-Assisted Transcription System uses the computer and peripheral devices to create a flow of enlarged, plain language machine-readable text, so that it is spoken, with no discernible delay. It is designed to be used in meetings, conferences, and other settings to assist the hearing-impaired in lieu of the less widely available skill of sign language.

Learning Finger Spelling
David N. Boyer

A computer graphics program is presented for deaf or hearing persons who need practice reading finger spelling. It features a representation of right-hand positions on a CRT, where the alphabet can be automatically displayed or single letters can be generated. A multiple-choice quiz format can be played.

Universal Translating Modem
Richard C. Buzzoqui, Jr.

The Universal Translating Modem enables a home computer or terminal to communicate with wideband TTY's, Bell 103 modems, and the DPL-NE computer network. This single, inexpensive unit provides access to a large and rapidly expanding network of data bases, facilities, and private individuals, without sacrificing compatibility with existing TTY's.

Communicator for the Non-Verbal
Norman R. Brines, Howard Lambert

A non-verbal communicator can be translated. A multiple-choice quiz program can be used for cerebral palsied, aphasic, deaf, and mentally retarded clients.

Learning Finger Spelling
Richard W. Hillinger

Most augmentation communication devices simply repeat the telegraphic nature of the user's input. The Computer Enhanced Language Software takes simple verbal input of one to four words and produces grammatically correct sentences in an alternate form. This computer-enhanced speech program can be used for cerebral palsied, aphasic, deaf, and mentally retarded clients.

V CATS TRS 80 for Finger Spelling
Thomas J. Huston

V CATS is a Visual Computer Augmented Teaching System designed to run on an inexpensive color graphics computer. The system teaches DTMF (Dual-Tone Multifrequency) signals, which may be sent from any Touch-Tone™ telephone, to a visual character display. Advantages over existing methods are discussed.

Learning Finger Spelling
Sandra J. Jackson, Judy M. Simmons, Tony Wedig

Programs for Learning Disabled

Margaret F. Muier, James A. Till

Communicating with Menus of Words

The Message Converter

Robert E. Glaser

The Message Converter permits deaf individuals to receive telephone messages without special equipment at the sending party's location. A simple sending code consists of a sequence of Touch-Tones™ into an alphanumeric message, displayed on an ASCII CRT terminal, ASCII or Baudot teletype, or visual Morse code.

Computer-Assisted Transcription System

Lip-Reader Trainer
Robin L. High

A means of converting typed sentences into animated mouth movements, thereby providing a flexible teaching aid for the teaching of lip-readers is offered by the Lip-Reader Trainer. In addition, a method of postevaluation is offered.

Computer Enhanced Language
Michael Hillinger

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Communication Aid with Scanning

Harry Levitt

The Microprocessor System operating in parallel with a personal computer. It multiplies the existing keyboard with the alternate character selection, manages the character selection display, monitors a user-variable character selection mechanism, and provides character sequence phrases. Normal operation is maintained, and no custom user software is necessary.

Portable Telecommunications for the Deaf

Robert Knickern

The Portable Telecommunications for the Deaf is a TRS-80 pocket computer used as a portable telecommunication system for the deaf. It can send and receive messages over any telephone. The system is significantly less expensive than a teletypewriter and costs less to operate because of more efficient use of the telephone channel.

Vocalization Trainer

Kenneth Macuric

The Vocalization Trainer is a program that shapes appropriate pronunciations using a box of words. Words or sounds may be placed in the computer for use as a model. Upon imitating or vocalizing the hearing-impaired student receives a visual display that can be compared to the model sound for both length and modulation.

Communicating with Menus of Words

William D. McFarland

Communicating with Menus of Words is an expressive language program that allows a person with limited motor control to form simple sentences. Menus of familiar words are revised and selected by entering a corresponding number. The selection is then maintained until subject, verb, and object have been chosen. The disabled person may then choose to print the sentence on a small printout.

Voice Communications with Special Inputs

Russell H. Mills, Richard P. Thomas

Language Therapy for Aphasia

The Environmental Status Board for the Deaf

Ronald R. Mitchell

The Environmental Status Board for the Deaf is an ongoing project to interface and program a computer to provide monitor, alarm, and display functions for a deaf couple in a single-family house. A control and display panel was designed and built, as well as a number of interfaces for
brings signals to the computer and controlling house lighting.

Computerized Tape Printer
Kirk M. Reid

The computerized Tape Printer allows a cerebral palsied individual without speech, with-out sight, and with severe involuntary movement to create a written message. The device contains a microprocessor and paper for the physically severely hand-capped (and perhaps nonspeaking) child. Teaching words, problems, words, or questions. By using one or two input switches, students are able to do schoolwork without help. Output is on video and hard copy.

Synchronous Oriented Receiving Terminal
Scott B. Solomon

Sort-2 (Synchronous Oriented Receiving Terminal) uses the large-scale integration of a 6800 microprocessor to decode a series of continuous radio signals. Data are displayed on an LED display on a video and hard copy.

LEARNING DISABILITY

Counting Skills for Learning Disabled
Don K. Crowther

Counting Skills for Learning Disabled is a computer-based instructional program that teaches elementary counting skills to learning-disabled students. The lessons use high-resolution color graphics, music and sound effects, practice exercises, and tests. The program also contains various lesson-related aids for the special education teacher.

Computer Aided Learning in Early Childhood Education
Mary G. Hatch

An Apple computer, a speech synthesizer, and a light pen are used to teach children at the preschool age levels and above. The execution of the program requires minimal supervision and is designed to be carried out by young children in general, and particularly those who exhibit impairments in physical and/or mental development, including restricted range of motion and deficiencies in vision and/or hearing.

"VAKT 80" Letter Tracing for Dyslexics
Fred E. Kagan

"VAKT 80" is a computer program that simulates the V-visual A-auditory K-kinesthetic T-tactile or multisensory reading techniques for dyslexic and learning-disabled students. The student traces words on a video screen using a light pen while a voice synthesizer simultaneously sounds out the proper letter-sound combinations of the words.

PRIMER81, Training System for Dyslexics
Bruce R. Lund, David M. Farmer

PRIMER81 is a server-oriented computer graphics program that enables: (a) self-diagnosis of specific difficulties in pattern recognition; (b) alteration of font and presentation time to improve discrimination; (c) instantaneous recognition training for common words and word groups; and (d) motivation through rapid feedback, amusements, and adaptive drills matching individual preferences.

Dyslexia Diagnostic Tool
Carole Mountcastle

The Dyslexia Diagnostic Tool is a computer application that uses interactive graphics as a diagnostic and treatment tool for learning-disabled children. It focuses specifically on children who have a type of dyslexia characterized by letter reversals. Color graphics will highlight language symbols using voice prompts, and the subject will respond with touch and voice input.

Math Problems for Learning Disabled
Parwane Parsa

The Math Problems for Learning Disabled program generates random math problems. It can be used with a printer to give students worksheets, or to drill children with learning disabilities. This program is a timesaver that frees the teacher from writing worksheets and makes learning interesting and fun for the student.

CAI for Learning Disabled
Richard D. Swenson, James C. Kingman

CAI for Learning Disabled is a group of six drill-and-practice type programs that were designed to be used in a self-contained special education classroom for educable mentally retarded and learning-disabled elementary-school-aged children.

Improving Math and Reading Skills
Joseph L. Terpening

The Improving Math and Reading Skills program was designed to encourage the learning disabled to improve math skills (for every question answered correctly, a star appears on the screen), increase reading speed (the story can be read as increased speeds as the child progresses), and improve spelling (a look and remember concept).

PrestoDigitizer
David D. Torbourn

The PrestoDigitizer is the lowest cost commercial device that allows low-cost microcomputers to accept hand-printed character input. The adaptable nature of this device allows the user to teach the computer his or her own printing style, thus making this device most useful for users who are unable to use the conventional computer keyboard.

MENTAL RETARDATION

Driver's Education Drill for Learning Disabled
V. Mariaetta Blessing

A self-paced drill on driver's education drill, entitled "Drive to Live," is designed to aid the learning-disabled student secure a driver's license. It is hoped that, after using it, the student will be able to pass the road rules test. The presentation consists of a TRS-80 computer program on cassette tape.

Specialized Training Program and Client Data Base
Shawn M. Boles, Ronald W. Wheeler

Social service programs seeking to aid the mentally retarded are almost universally lacking in adequate data acquisition needed to guide and improve the programs. The Specialized Training Program and Client Data Base uses an in-house microprocessor-based system to collect data and provide immediate feedback in an effort to improve the quality of service for severely handicapped adults.

CAI with Voice Output
James O. Calvin

The thrust of CAI with Voice Output is to combine speech with a computer-assisted instruction system. Using digitally recorded speech, students perform exercises and in sight vocabulary. The CAI system verbally tells the student to set the time or point to a particular word.

Light Pen Learning Drill
Mary G. Hatch

The Light Pen Learning Drill is a computer learning drill for the mentally retarded and neu-rologically handicapped in which the dialogue between the computer and the child is both visual and aural. The child points a light pen at the TV display after a request is made by the computer. The child is then vocally congratulated for a correct response or encouraged to try again if the response is incorrect.

Teaching Money Skills
Jamelle Loebr

Teaching Money Skills is a computer program that teaches money identification and counting skills to retarded students. Digitalized voice is used to provide instructions and feedback to the learner. The student responds through the use of a game-paddle pushbutton and is guided through a computer-aided self-charting sequence at the end of the lesson.

Vocal Math Drill for Learning Disabled
Alfred E. Springer

Vocal Math Drill for Learning Disabled is a computer-generated arithmetic drill (addition) for the education of the learning disabled. Problems are given both visually by the CRT and orally by the Speak-N-Spell. Both visual and oral statements encourage the student as a marker is moved toward a goal by correct answers.
MOVENT
Independent Switch Interface with TRS-80
Michael A. Chase
Using the Independent Switch Interface and a key switch, a person with coordination problems can interact with any program running on the TRS-80, except the Lower Case Display. Programs that run normally under TRS-80 Disk Operating System can use this program for input without modification.

HCINP, Alternate Input Interfacing
Richard Chaprinoko
The Handicapped Input (HCINP) Subroutine is designed to provide a method of input, other than a keyboard, to a microcomputer. Individuals who are quadriplegic or handicapped by various motor-control disabilities are aided in operating a microcomputer for personal, business, occupational, or therapeutic purposes.

Computer-Based Therapeutic System
Thomas M. Cook
A Computer-Based Therapeutic System is offered for use in rehabilitating patients with a number of walking disabilities. Using a microcomputer as an interactive controller, theories of motor learning are applied to assist these patients in regaining the weight-bearing and weight-shift abilities necessary for safe and efficient ambulation.

Single-Switch Communication System
John E. Dalhaus
The Single Switch Communication System allows a person with limited movement to display and print a message using only one switch. The system includes an eight-character alphanumeric display and an optional teletypewriter. Other features include editing and variable speed operation. The device is easy to use, low cost, and compact.

Magical
Frank L. Eppenger, Harry Pinkney
Magical is a sound-activated switch.

Menu Assisted Data Entry System
Jeffrey S. Fisher
The Menu Assisted Data Entry System provides the means for entering alphanumeric and special character data into a general-purpose microcomputer using a special-purpose impulse device and video screen menus. This system will permit the handicapped user to construct and enter character strings for a variety of standalone and network applications with greater ease.

EyeTracker Communication System
Mark B. Friedman, Gary Kiliarny, Mark Demura, Drew Anderson
The EyeTracker Communication Aid allows a physically handicapped person to use eye movements to efficiently control high-quality speech output. The system, based on a single microcomputer and a small TV camera, is working in a classroom. A battery-powered portable version, including only one custom PC board, is currently being built.

"Lightboard," Alternate Computer Input
James L. Hardee
The "Lightboard" is a computer input device for people with severe motor-control handicaps. This device uses photocell switches in place of the keys normally found on a keyboard. Although it must be custom built, it is relatively inexpensive and very versatile, and is simply plugged into the keyboard input.

Hands Free Speaker Phone Dialer
Jackson D. Harris
The Hands Free Speaker Phone Dialer is a solid-state control unit attached to a 16-number telephone dialer. It totally incapacitated person to use a telephone to answer incoming calls and originate outgoing calls by voice commands.

Barrier Information from Videotex
Douglas Hatch
A Videotex System in the Hartsfield International Airport provides helpful information about barriers at airports around the world and also in hotels, public structures, and major office buildings in Atlanta. Also included are the activities, equipment rental and repair, and other special services.

Electronic Keyboard
Richard A. Henle
The Electronic Keyboard is a personal computer-based device designed to replace character-to-character typing on keyboard-driven systems for those without the use of their hands. Instead, the words, commands, and entire sentences are pointed to on a separate video screen with a chin-actuated joystick. The system is easily expandable to voice input.

Smart Wheelchair
David L. Jaffe
To allow quadriplegics independent mobility, a "smart" microprocessor-based electric wheelchair has been developed. Ultrasonic and distance-ranging technology is employed to track the user's head in two-dimensional space. These data are then used to determine the chair's direction and speed. Noncontacting motion control, obstacle detection, and wall following are implemented features.

Neuromuscular Control of Microcomputer
Donald J. Kark
The Neuromuscular Control of Microcomputer device allows people with immobile or nonexistent limbs to control a wheelchair directly and a computer indirectly. It processes the neuromuscular signals given off by the person's jaw and creates a digital signal. The signal is then coupled, with time as a factor, to the computer or wheelchair control electronics.

Neuromuscular Disorders

Interfaces for Disabled
Margaret R. Barker, William R. Hastings
Interfaces for Disabled is a self-contained, portable, menu of evaluation and training with interfaces (single switches, joystick) that can be used in conjunction with mobility, communication, and environmental control aids by individuals with physical disabilities. This microprocessor-based system facilitates quantitative measurement of performance with the interface and visual and/or auditory outputs.

Message Generator for the Nonverbal
Richard J. Mark
A computerized Message Generator for the Nonverbal with limited motor control has been developed. By hitting any alphanumeric key on the keyboard or by closing a simple external switch, the handicapped person can select words categorized into commonly used words, in order to generate sentences on the screen or on a printer.

Pneumatic Binary Switch Input for TRS-80
Robert Buss
A means is described for a neuromuscularly handicapped person to easily and economically provide binary input to a Radio Shack TRS-80 computer. It consists of a pneumatic tube or wedge switch interfaced to a simple battery-operated oscillator circuity that, in turn, interfaces to the cassette port of the computer.

Control Programs for Severely Motor Impaired
E. Paul Goldenberg
Four workable computer programs illustrate a design for individuals with severe motor impairments. Programs include: 1) a text editor; 2) a dictionary, allowing the user to look up words, with error-free text input; 3) a word processing system; and finally, 4) a spell checker.

Computer Evaluation Kit for Mobility Impaired
John S. Kithpauge
The Computer Evaluation Kit is an evaluation unit for computer skills and a computerized self-care program. A mobile (T99/4) computer is used for 'keys'. A motivated, severely mobility-impaired person may program the kit for data entry, word processing, and simple medication and care management.

Motor-Handicapped Support System
Resul O. Launey III
A multifunction printed circuit board and software package has been designed as an aid for a quadriplegic or other motor-handicapped individual. The low-cost board is plugged into a personal computer and gives the handicapped person voice control of the computer and a number of electronic functions.

User Definable Keyboard
Ronald S. McCusson
The User Definable Keyboard is a computer program to redesign the arrangement of keys on a typewriter or computer keyboard. After the user enters any text into his computer, the program gives a statistical analysis showing a count of each type of character struck and the use of each finger and hand.

Add-On Remote Keyboard
Brian D. McKean
An Add-On Remote Keyboard has been designed for the Radio Shack TRS-80. Features include "keys" of different size, low cost, and easy interface to the TRS-80. Single or low-cost key case keys allow one-hand (wand) operation; two-tone audio feedback indicates key entry and double-key entries (DD, YY, etc.).

Communication and Environmental Control
Leslie A. Nieves, Richard S. Campbell
Communication and Environmental Control is a microprocessor-based communication and environmental control system that combines flexibility and ease of operation at a relatively low cost. It can function as an electronic typewriter, word processor, emergency alarm system, telephone answering and dialing machine, remote control for electrical outlets, timer, and entertainment device.

UNICOM: Communicator for the Disabled
Derek Rowell, George F. Dalrymple
A video display, microprocessor-based system, the UNICOM, has been developed as a communication device for severely motor-impaired non-quadriplegics. The UNICOM can be adapted to serve users with many different motor impairments by selecting the appropriate user/machine interface (switches or controls) and without modifying the basic unit.

NEUROMUSCULAR DISORDERS

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VIDEO-SCROLL Switch Communicator
James H. Herzog
VIDEO-SCROLL is a communication aid providing greater independence to individuals with neuromuscular handicaps that prevent speech or typing. A contact closure transducer directs a selective microprocessor and editor that produce, store, manage, and print large quantities of error-free text.

Communications, Control, Music, Graphics
Paul S. Holman
A communications, control, music, and graphics generator has been devised for quadriplegics and others with severe motor disabilities. The system is menu-driven, with the menus being presented visually and aurally. The human interface is a single response made by a thumb button, eye blink, or touch switch.

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Programming Interface for Motor Impaired

Jeff L. Levine

Programming Interface for Motor Impaired runs on an unmodified Apple II computer and allows creation of application programs (not necessarily developed for the handicapped) and a powerful interface program to run concurrently on the same computer. Communication between the applications and the interface increases ease of time.

NEUROLOGICAL DISORDERS

Optically Actuated Keyboard System

The Optically Actuated Keyboard System (OAKS) was developed for persons with handicaps who lack the physical ability to control manual keyboards. The prototype is used to control a Texas Instruments Speak-N-Spell; it has been demonstrated to be effective with cerebral palsied children.

Switch Control of Microcomputer

Arthur S. Gaylord, Stanley Smith, Peter Beak

Switch Control of Microcomputer is a program to aid persons with neurological diseases or severely limited dexterity in a variety of tasks, including message writing, control of lighting and appliances, and telephone dialing. The program is controlled entirely by a button that is used to select items from a menu addressed by a moving cursor.

Coded Communicator and Editor

Jean M. Riley, Richard Roe

The Coded Communicator and Editor consists of a program that allows a handicapped individual to create error-free typed text with a minimum of key strokes. It is comprised of a text editor and a unique method of using codes for word entry.

Rehabilitation for Brain Injured Adults

Joan Knorr, Richard Roe

Rehabilitation for Brain Injured Adults programs are designed for survivors of stroke, head trauma, and other injuries to the brain. Three visual perception programs include Reaction Time Measure of Visual Field, Searching for Shapes, and Speeded Reading of Word Lists. Four programs focus on memory: Free Recall, Memory Span, Triplet Recall, and Sequence Recall.

Voice Entry Computer Work Station

Eugene Spalding

The Voice Entry Computer Work Station and the specified hardware will allow a neurologically or movement-impaired individual to accomplish the following: (a) work in data entry or programming, (b) communicate via telephone and letter, and (c) control the home environment. This gives the user greater independence by using direct voice entry to control a home computer.

Interactive Programming for Motor Impaired

Russel W. Van Norman

The Electromyographic Control of Microcomputer demonstration system consists of a pulsewidth modulated FM transmitter that picks up and transmits the electrical activity of a voluntarily controlled skeletal muscle group. This signal is used to control a computer (in this system, an Elf II COSMAC 1802 computer) with a video display providing a communication or environmental control ability for the severely handicapped.

VISION

Audible Tone Readout/Digital Display

William H. Allison

The Audible Tone Readout/Digital Display is a microcomputer-based device that provides an audible readout (tone encoded) for use by the blind. Using this device, a blind person can read typical 7-segment digital displays now used on industrial instrumentation and personal-use electronic equipment, process and digital lab instruments, clock frequencies, counters, digital dials, etc.

Computerized Mechanical Hand for Deaf-Blind

Winula E. Beeson

The Computerized Mechanical Hand for Deaf-Blind is a microcomputer-controlled mechanical hand that reproduces the manual alphabet. When an alphabetic key is pressed on the microcomputer keyboard, the hand will finger spell the letter and a deaf-blind individual can "read" it. This will allow deaf-blind individuals who are unable to use the tiny braille pads to communicate over the telephone lines.

Total Talk

Deane B. Blazie

Total Talk is a computer terminal that vocally speaks any information that a sighted operator reads, eliminating the vision requirement of working with a computer. The terminal was developed by Maryland Computer Services for the blind computer user. Existing installations are in both the vocational and educational environments.

Braille Embossing Calculator for the Blind

David A. Desanto

The Braille Embossing Calculator for the Blind is a calculator modified for use by the blind or visually impaired.

Braille Text Embossing

Randy W. Dipner

Braille Text Embossing is a system developed to produce low-volume, low-cost braille text using off-the-shelf microprocessor hardware with minor modifications. The system is functional today to 10 keys, limited additional work to be made available to the community.

Orator, Talking Terminal

Peter Duran

The Orator is a combination of computer hardware and software that can enable a personal computer to "speak" its output rather than print it on a terminal screen or piece of paper. Access to a personal computer could aid the blind in numerous ways from keeping financial records to storing recipes.

Computer Controlled TV Image Enhancement

Sandy H. Edmonds

The Computer Controlled TV Image Enhancement allows variable speed movement of the X-Y table of a closed circuit television system. This system requires a minimum amount of gross and fine motor control by low vision users who are also orthopaedically or neuromuscularly impaired.

SIGHT

Peggy S. Eyrich

SIGHT is a hand-held general-purpose terminal device used by visually impaired persons to communicate. The system is a combination computer equipped with a standard serial interface connection (RS-232). It will be inexpensive enough to allow an employable person to own one. A cassette recorder in the device allows off-line entry to store data for future use.

Introduction to Computer with Synthesizer

Richard Gage

Introduction to Computer with Synthesizer provides an introduction to the computer by means of a dialogue between the system and the user. It helps the user to develop confidence in his ability to respond to, and feel comfortable with, the system. This program should encourage the user to develop further skills by providing a pleasant and informative first-time experience with the system.

Random Access of Digital Voice Records

Raymond Glenn

This random-access digital system for recording spoken text for the blind features an annotated table of contents, paragraph headings, figures, etc., thereby letting a user randomly select passages by content. It also enables the user to speed up the output rate of speech without frequency distortion, a form of speed reading.

KANSYS, Talking Operating System

Charles E. Hallenbeck

KANSYS is well behind hardware in providing speech access to computers. The KANSYS Operating System and its "Talking Terminal" program help to close this gap. Blind persons will find it easy to realize the power of personal computers with a system fully committed to speech communication. Blindness is no handicap in using this system.

Product Identifier for the Blind

Jay C. Hardin

The Product Identifier for the Blind is a home computer with a light-sensitive touch screen. The voice or braille readout to read the spaced line markings on food cans, thus allowing a blind person to determine their contents.

APPLE Sound Outputs for the Blind

Richard Hartness

APPLE Sound Outputs for the Blind describes four programs written for the Apple II computer that allow a blind person to use the computer as easily as a sighted person. They provide output in spelled speech, synthesized text-to-speech, and Morse code. The Morse code program does not require additional hardware; the others do.

Automatic Braille Transcription System

John J. Hoefer, Paul F. Arnold, Max Weddell

The Automatic Braille Transcription System automates the braille transcription process. Any person can perform the transcription in a way to transcribe and output braille text directly. Proofreading and editing remain the transcriber's responsibility. More efficient use of human resources and increased availability of scientific texts result.

Braille-Edit

David F. Holladay

Braille-Edit is a text editor for the Apple II computer designed to deal with braille-oriented material. It has an optional braille CRT display and an optional braille keyboard mode (6 keys,
like a Perkins braille writer. It is designed to allow a sighted person to download material to a visually impaired person with access to the terminal's display. PAL TALK can store forty eight characters in its line buffer, and the user gains access to that information via the switches on PAL TALK's control box. PAL TALK is a spell-checked speech interface for a computer terminal that was created to provide a visually impaired person with access to the terminal's display. PAL TALK can store forty eight 80-character lines in its buffer, and the user gains access to that information via the switches on PAL TALK's control box. PAL TALK is a spell-checked speech interface for a computer terminal that was created to provide a visually impaired person with access to the terminal's display. PAL TALK can store forty eight 80-character lines in its buffer, and the user gains access to that information via the switches on PAL TALK's control box. PAL TALK is a spell-checked speech interface for a computer terminal that was created to provide a visually impaired person with access to the terminal's display. PAL TALK can store forty eight 80-character lines in its buffer, and the user gains access to that information via the switches on PAL TALK's control box. PAL TALK is a spell-checked speech interface for a computer terminal that was created to provide a visually impaired person with access to the terminal's display. PAL TALK can store forty eight 80-character lines in its buffer, and the user gains access to that information via the switches on PAL TALK's control box. PAL TALK is a spell-checked speech interface for a computer terminal that was created to provide a visually impaired person with access to the terminal's display. PAL TALK can store forty eight 80-character lines in its buffer, and the user gains access to that information via the switches on PAL TALK's control box. PAL TALK is a spell-checked speech interface for a computer terminal that was created to provide a visually impaired person with access to the terminal's display. PAL TALK can store forty eight 80-character lines in its buffer, and the user gains access to that information via the switches on PAL TALK's control box. PAL TALK is a spell-checked speech interface for a computer terminal that was created to provide a visually impaired person with access to the terminal's display. PAL TALK can store forty eight 80-character lines in its buffer, and the user gains access to that information via the switches on PAL TALK's control box. PAL TALK is a spell-checked speech interface for a computer terminal that was created to provide a visually impaired person with access to the terminal's display. PAL TALK can store forty eight 80-character lines in its buffer, and the user gains access to that information via the switches on PAL TALK's control box. PAL TALK is a spell-checked speech interface for a computer terminal that was created to provide a visually impaired person with access to the terminal's display. PAL TALK can store forty eight 80-character lines in its buffer, and the user gains access to that information via the switches on PAL TALK's control box. PAL TALK is a spell-checked speech interface for a computer terminal that was created to provide a visually impaired person with access to the terminal's display. PAL TALK can store forty eight 80-character lines in its buffer, and the user gains access to that information via the switches on PAL TALK's control box. PAL TALK is a spell-checked speech interface for a computer terminal that was created to provide a visually impaired person with access to the terminal's display. PAL TALK can store forty eight 80-character lines in its buffer, and the user gains access to that information via the switches on PAL TALK's control box. PAL TALK is a spell-checked speech interface for a computer terminal that was created to provide a visually impaired person with access to the terminal's display. PAL TALK can store forty eight 80-character lines in its buffer, and the user gains access to that information via the switches on PAL TALK's control box. PAL TALK is a spell-checked speech interface for a computer terminal that was created to provide a visually impaired person with access to the terminal's display. PAL TALK can store forty eight 80-character lines in its buffer, and the user gains access to that information via the switches on PAL TALK's control box.