This resource presents the functional effects of chronic disabilities in order to aid those persons who must plan environments usable by persons with disabilities. The guide does not concern architectural accessibility per se, but rather discusses designing the worksite to be usable by a disabled person. In the guide, drawings are provided for office (worksite 1) and factory (worksite 2) settings for each of the following disabilities: difficulty in interpreting information; limitation of sight; limitation of hearing; limitation of speech; susceptibility to fainting, dizziness, and seizures; incoordination; limitation of stamina; difficulty in moving head; limitation of sensation; difficulty in lifting and reaching with arms; difficulty in handling and fingering; inability to use upper extremities; difficulty in sitting; difficulty in using lower extremities; and poor balance. Guidelines are given for making the worksite usable by persons with each of these limitations. The guide also includes a bibliography and a list of suppliers of products mentioned in the guide. (KC)
ACKNOWLEDGEMENTS

Many individuals of diverse backgrounds have contributed invaluable personal knowledge and insight to the development of this resource. They have demonstrated their commitment to the independence of disabled persons by offering their time and expertise. The ultimate usefulness of this resource owes much to their efforts.

Dr. Andy Bazar, Wichita State University
Mr. Mickey Berg, National Spinal Cord Injury Foundation
Ms. Judy Berland, District of Columbia Division of Vocational Rehabilitation
Mr. Clayton Boyd, U.S. Office of Personnel Management
Mr. Ted Brosnan, Chesapeake & Potomac Telephone Company
Ms. Susan Burns, U.S. General Accounting Office
Dr. W.S. Chiu, The George Washington University Medical Center
Dr. R.A. Dudek, Texas Tech University, Department of Industrial Engineering
Ms. Gerry Edwards, The George Washington University Medical Center
Mr. Rolf Faste, Syracuse University, Department of Design
Ms. Judith Frank, The Job Development Laboratory
Mrs. Marie Feingold, District of Columbia Division of Vocational Rehabilitation
Ms. Edna T. Harris, Epilepsy Foundation of America
Ms. Ann Irving-O'Brien, The George Washington University Medical Center
Dr. Robert H. Jones, Eastman Kodak Company
Ms. Marian G. Knowles, Human Factors Society
Mr. Aaron Krute, Social Security Administration, Office of Research and Statistics
Mr. Kali Mallik, The Job Development Laboratory
Ms. Maggie Malsch, National Spinal Cord Injury Foundation
Mr. Raymond Nickerson, Bolt, Beranek, and Newman, Inc.
Dr. Carol Ann Peterson, University of Illinois, Department of Leisure Studies
Ms. Eileen Powers, The Job Development Laboratory
Ms. Judith Pustell, Arthritis Foundation
Ms. Elaine Shaver, The Job Development Laboratory
Mr. Edward Steinfeld, State University of New York at Buffalo
Mr. Joseph Traub, Rehabilitation Services Administration
Ms. Janet Williams, District of Columbia Division of Vocational Rehabilitation
Mr. Sheldon Yuspeh, The Job Development Laboratory
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INTRODUCTION

This resource is a presentation of the functional effects of chronic disabilities. Knowledge of these effects is essential in planning environments usable by persons with disabilities.

This resource does not concern architectural accessibility per se. Many excellent publications are available on this subject; some are listed in the Bibliography. Designing for Functional Limitations deals instead with "usability". An accessible building in which a disabled person cannot function independently is as much a barrier as an inaccessible building. Few resources offer information on how to maximize the abilities of the disabled person beyond accessibility in the work environment.

The illustrations which follow, and the accompanying text, have been designed to help in planning functional environments most sensitive to the abilities and limitations of disabled persons. WORKSITE 1 and WORKSITE 2 illustrations may appear to be common work environments. They are: WORKSITE 1 is an office-type setting, and WORKSITE 2 is a more industrial setting. Added to these illustrations are guidelines for worksite design which can aid not only a large percentage of disabled employees, but also non-disabled employees. As some worksites may be a combination of an office and industrial setting, it is recommended that both Worksite 1 and Worksite 2 guidelines be used to plan modifications to a specific site. Guidelines noted on pages 5 and 7 have been compiled from resources listed on the reverse side of each page.
SLIDING WINDOWS PREFERRED

WINOOW CONTROLS
20 - 54" (508 - 1372mm)
MAX. OPERATING FORCE
5 LB (22.2 N)

FLOORS
18 - 48" (457 - 1219mm)
LOCATE BULKIEST OBJECTS
ON LEVEL WITH DESK

WALLS
USE SLIP-RESISTANT, NON-GLARE SURFACES
AVOID ROUGH SURFACES AND PROTRUING OBJECTS
AVOID TOTAL SOUND ABSORPTION

MAX. SHELF HEIGHT
63" (1600mm)

TELEPHONES
LOCATE CENTER OF DRAWERS
RECEIVER WITH VOLUME CONTROL
HANDSET CORO 36" (914mm) MIN.

INTERIOR SIGNS
LOCATE NEAR DOOR FRAME ON LATCH SIDE
LABEL USABLE FACILITIES WITH SYMBOL

LETTERING
LIGHT-ON-DARK PREFERRED
0.625 - 1" (16 - 25mm) HELVETICA TYPE (ALL CAPS)
RAISED 0.03" (1mm)
MAY BE ACCOMPANYED BY BRAILLE
SIGN HEIGHT 54 - 66" (1372 - 1676mm)

DOORS
CLEAR SPACING ON BOTH SIDES OF DOOR
SIDE-HUNG PREFERRED TO SLIDING TYPE
DOOR SHOULD OPEN INTO LOWER TRAFFIC AREA
GLASS SHOULD HAVE DECALS AT FACE HEIGHT
0.5" (12mm) MAX. THRESHOLD

WORK STATION
AVOID CENTER DRAWERS
24" (610mm) MIN. KNEE WELL WIDE
AVOID SHARP EDGES AND CORNERS
NON-GLARE LIGHTING TO MINIMIZE FATIGUE

STORAGE CABINETS
DRAWERS WITH ROLLERS FOR EASY OPERATION
U-SHAPED HANDLES: 4" x 1.5" (102mm x 38mm)
DRAWERS SHOULD BE OPERABLE WITH ONE HAND

SEATING
ADJUSTABLE HEIGHT AND SUPPORT FOR LOWER BACK
(Feet should rest on floor or other support)

FLASHING VISUAL ALARM (less than 5 Hz)
8000 Hz AUDITORY ALARM (120 db max.)

EMERGENCY
ODOR CLOSER RESISTANCE
5 - 15 LB (22.2 - 66.7 N)
pref. adjustable

WORKSITE 1
Specifications on the reverse side are based on body measurements of the "average adult." Extremes of size and weight may require adjustment of some specifications. Further explanations of these guidelines may be found in the following resources, from which all specifications have been compiled:

**CABINETS, DRAWERS, FILES**

Diffrient, Tilley, Bardagjy, *Humanscale 1/2/3*, 3a, 3b  
Goldsmith, *Designing for the Disabled*, 245-251, 315  
Steinfeld, *Barrier-Free Design for the Elderly and Disabled*, 111

**CLOTHES HOOKS**

Goldsmith, *Designing for the Disabled*, 314  
Ohio Governor's Committee on Employment of the Handicapped, *Access for All*, 115  
Veterans Administration, *Handbook for Design: Specially Adapted Housing*, 43

**DOORS AND HARDWARE**

Cary, *How to Create Interiors for the Disabled*, 24-31  
Diffrient, Tilley, Bardagjy, *Humanscale 1/2/3*, 26, 30  
Duncan, Gish, Mulholland, Townsend, *Environmental Modifications for the Visually Impaired: A Handbook*, 444  
Goldsmith, *Designing for the Disabled*, 185-190  
Harkness, Groom, *Building Without Barriers for the Disabled*, 21-33  
Mace, *An Illustrated Handbook of the North Carolina State Building Code*, 34, 35, 39, 40; and *Accessibility Modifications*, 21-25  
Ohio Governor's Committee on Employment of the Handicapped, *Access for All*, 117, 77-80  
Steinfeld, *Barrier-Free Design for the Elderly and Disabled*, 100-103, 76  
Veterans Administration, *Handbook for Design: Specially Adapted Housing*, 14-17

**ELECTRICAL OUTLETS**

Diffrient, Tilley, Bardagjy, *Humanscale 1/2/3*, 3b  
Goldsmith, *Designing for the Disabled*, 212-213  
Ohio Governor's Committee on Employment of the Handicapped, *Access for All*, 110, 118  
Veterans Administration, *Handbook for Design: Specially Adapted Housing*, 41

**EQUIPMENT CONTROLS**

Bazar, *Ergonomics in Rehabilitation Engineering*, 55-71  
Steinfeld, *Barrier-Free Design for the Elderly and the Disabled*, 111

**FIRE ALARMS/EXTINGUISHERS**

Harkness, Groom, *Building Without Barriers for the Disabled*, 16, 18  
Ohio Governor's Committee on Employment of the Handicapped, *Access for All*, 112, 125  
Steinfeld, *Barrier-Free Design for the Elderly and the Disabled*, 72

**FLOORS**

Diffrient, Tilley, Bardagjy, *Humanscale 1/2/3*, 26  
Goldsmith, *Designing for the Disabled*, 196-197  
Harkness, Groom, *Building Without Barriers for the Disabled*, 16, 34  
Ohio Governor's Committee on Employment of the Handicapped, *Access for All*, 75

**INTERIOR SIGNS**

Diffrient, Tilley, Bardagjy, *Humanscale 1/2/3*, 28, 29, 3b  
Harkness, Groom, *Building Without Barriers for the Disabled*, 16-18  
Mace, *An Illustrated Handbook of the North Carolina State Building Code*, 84-85  
Ohio Governor's Committee on Employment of the Handicapped, *Access for All*, 112-113

**SHELVES**

Diffrient, Tilley, Bardagjy, *Humanscale 1/2/3*, 3a, 3b  
Goldsmith, *Designing for the Disabled*, 123-126  
Veterans Administration, *Handbook for Design: Specially Adapted Housing*, 43

**TABLES, DESKS, WORK STATIONS**

Austin, *Resources Handbook for Barrier-Free Design*, 79  
Diffrient, Tilley, Bardagjy, *Humanscale 1/2/3*, 3a, 3b  
Grandjean, *Fitting the Task to the Man*  
Harkness, Groom, *Building Without Barriers for the Disabled*, 36  
Mace, *An Illustrated Handbook of the North Carolina State Building Code*, 92-93  
Ohio Governor's Committee on Employment of the Handicapped, *Access for All*, 115  
Trombly, Scott, *Occupational Therapy for Physical Dysfunction*, 391-392

**TELEPHONES**

Cary, *How to Create Interiors for the Disabled*, 110  
Diffrient, Tilley, Bardagjy, *Humanscale 1/2/3*, 26, 3a  
Goldsmith, *Designing for the Disabled*, 214  
Ohio Governor's Committee on Employment of the Handicapped, *Access for All*, 109, 125  
Veterans Administration, *Handbook for Design: Specially Adapted Housing*, 41

**THERMOSTAT**

Mace, *An Illustrated Handbook of the North Carolina State Building Code*, 84-85  
Ohio Governor's Committee on Employment of the Handicapped, *Access for All*, 111

**WALLS**

Diffrient, Tilley, Bardagjy, *Humanscale 1/2/3*, 26  
Harkness, Groom, *Building Without Barriers for the Disabled*, 16

**WALL SWITCHES**

Diffrient, Tilley, Bardagjy, *Humanscale 1/2/3*, 3b  
Goldsmith, *Designing for the Disabled*, 211  
Ohio Governor's Committee on Employment of the Handicapped, *Access for All*, 111  
U.S. Department of Housing and Urban Development, *Barrier-Free Site Design*, 17  
Veterans Administration, *Handbook for Design: Specially Adapted Housing*, 40

**WINDOWS AND CONTROLS**

Diffrient, Tilley, Bardagjy, *Humanscale 1/2/3*, 3a  
Goldsmith, *Designing for the Disabled*, 170-180  
Ohio Governor's Committee on Employment of the Handicapped, *Access for All*, 111, 124  
Steinfeld, *Barrier-Free Design for the Elderly and the Disabled*, 106%  
Veterans Administration, *Handbook for Design: Specially Adapted Housing*, 38
Walls
Use slip-resistant non-glare surfaces
Avoid rough surfaces and protruding objects
Avoid total sound absorption

Interior signs
Locate near door frame on latch side
Label usable facilities with symbol

Lettering
Light-on-dark preferred
0.025–1" (16–25mm) Helvetica type (all caps)
Raised 0.03" (1mm)
May be accompanied by Braille

Storage cabinets
Cabinet height 63" max. (1600mm)
U-shaped handles: 4" x 1.5" (102mm x 38mm)
Handles should be operable with one hand

Conveyors should be on same level as work surface

Temporary storage surface
For work materials in convenient location

Equipment controls
Lighted push-button switches preferred
Indicators should be visual and auditory
Min. control spacing: 1" (25mm)
75" (19mm) dia. or square control shape

Work station
Avoid sharp edges and corners
Non-glare lighting to minimize fatigue
Seating with adjustable height and support for lower back
(Feet should rest on floor or other support)

Specifications on this illustration suggest improvements to worksites which aid able-bodied as well as persons with sensory or lower extremity limitations. Considerations for more specific functional limitations are described on transparent overlays.
Specifications on the reverse side are based on body measurements of the "average adult." Extremes of size and weight may require adjustment of some specifications. Further explanations of these guidelines may be found in the following resources, from which all specifications have been compiled:

CABINETS, DRAWERS, FILES
Diffrient, Tilley, Bardagjy, Humanscale 1/2/3, 3a, 3b
Goldsmith, Designing for the Disabled, 285-291, 315
Nace, An Illustrated Handbook of the North Carolina State Building Code, 117
Steinfeld, Barrier-Free Design for the Elderly and Disabled, 111

CLOTHES HOOKS
Goldsmith, Designing for the Disabled, 316
Ohio Governor's Committee on Employment of the Handicapped, Access for All, 115
Veterans Administration, Handbook for Design: Specially Adapted Housing, 43

DOORS AND HARDWARE
Cary, How to Create Interiors for the Disabled, 24-31
Diffrient, Tilley, Bardagjy, Humanscale 1/2/3, 26, 30
Duncan, Gish, Mulholland, Townsend, Environmental Modifications for the Visually Impaired: A Handbook, 446
Goldsmith, Designing for the Disabled, 35-40 and Accessibility Modifications, 21-25
Ohio Governor's Committee on Employment of the Handicapped, Access for All, 117, 77-80
Steinfeld, Barrier-Free Design for the Elderly and Disabled, 100-101, 76
Veterans Administration, Handbook for Design: Specially Adapted Housing, 34-37

ELECTRICAL OUTLETS
Diffrient, Tilley, Bardagjy, Humanscale 1/2/3, 3b
Goldsmith, Designing for the Disabled, 212-213
Ohio Governor's Committee on Employment of the Handicapped, Access for All, 110, 118
Veterans Administration, Handbook for Design: Specially Adapted Housing, 41

EQUIPMENT CONTROLS
Bazar, Ergonomics in Rehabilitation Engineering, 55-71
Steinfeld, Barrier-Free Design for the Elderly and Disabled, 111

FIRE ALARMS/EXTINGUISHERS
Harkness, Groom, Building Without Barriers for the Disabled, 16-18
Nace, An Illustrated Handbook of the North Carolina State Building Code, 85
Ohio Governor's Committee on Employment of the Handicapped, Access for All, 112, 125
Steinfeld, Barrier-Free Design for the Elderly and the Disabled, 72

FLOORS
Diffrient, Tilley, Bardagjy, Humanscale 1/2/3, 26
Duncan, Gish, Mulholland, Townsend, Environmental Modifications for the Visually Impaired: A Handbook, 446-447
Goldsmith, Designing for the Disabled, 198-199
Harkness, Groom, Building Without Barriers for the Disabled, 16, 34
Ohio Governor's Committee on Employment of the Handicapped, Access for All, 75

INTERIOR SIGNS
Diffrient, Tilley, Bardagjy, Humanscale 1/2/3, 28, 29, 3b
Duncan, Gish, Mulholland, Townsend, Environmental Modifications for the Visually Impaired: A Handbook, 444-447
Harkness, Groom, Building Without Barriers for the Disabled, 16-18
Nace, An Illustrated Handbook of the North Carolina State Building Code, 84-85
Ohio Governor's Committee on Employment of the Handicapped, Access for All, 112-113

SHELVES
Diffrient, Tilley, Bardagjy, Humanscale 1/2/3, 3a, 3b
Goldsmith, Designing for the Disabled, 123-126
Nace, An Illustrated Handbook of the North Carolina State Building Code, 117
National Academy of Science, Accessibility: An Approach to the Development of Design Criteria, C12-C15
Veterans Administration, Handbook for Design: Specially Adapted Housing, 43

TABLES, DESKS, WORK STATIONS
Austin, Resources Handbook for Barrier-Free Design, 79
Diffrient, Tilley, Bardagjy, Humanscale 1/2/3, 26, 3a
Grandjean, Fitting the Task to the Man
Harkness, Groom, Building Without Barriers for the Disabled, 36
Nace, An Illustrated Handbook of the North Carolina State Building Code, 92-93
Ohio Governor's Committee on Employment of the Handicapped, Access for All, 115
Tromble, Scott, Occupational Therapy for Physical Dysfunction, 391-392

TELEPHONES
Cary, How to Create Interiors for the Disabled, 110
Diffrient, Tilley, Bardagjy, Humanscale 1/2/3, 26, 3a
Goldsmith, Designing for the Disabled, 214
Nace, An Illustrated Handbook of the North Carolina State Building Code, 114-115
Ohio Governor's Committee on Employment of the Handicapped, Access for All, 109, 125
Veterans Administration, Handbook for Design: Specially Adapted Housing, 41

THERMOSTAT
Nace, An Illustrated Handbook of the North Carolina State Building Code, 84-85
Ohio Governor's Committee on Employment of the Handicapped, Access for All, 111

WALLS
Diffrient, Tilley, Bardagjy, Humanscale 1/2/3, 26
Harkness, Groom, Building Without Barriers for the Disabled, 16

WALL SWITCHES
Diffrient, Tilley, Bardagjy, Humanscale 1/2/3, 3b
Goldsmith, Designing for the Disabled, 211
Ohio Governor's Committee on Employment of the Handicapped, Access for All, 111
U.S. Department of Housing and Urban Development, Barrier-Free Site Design, 47
Veterans Administration, Handbook for Design: Specially Adapted Housing, 40

WINDOWS AND CONTROLS
Diffrient, Tilley, Bardagjy, Humanscale 1/2/3, 3a
Goldsmith, Designing for the Disabled, 179-180
Ohio Governor's Committee on Employment of the Handicapped, Access for All, 111
Steinfeld, Barrier-Free Design for the Elderly and the Disabled, 106
Veterans Administration, Handbook for Design: Specially Adapted Housing, 38
HOW TO USE THIS RESOURCE

The following is an example of how DESIGNING FOR FUNCTIONAL LIMITATIONS can be used.

Paul has applied for the job of information receptionist at a large government office. He has a high-school diploma and some college experience. Paul has cerebral palsy. He is qualified for the job, but he and his prospective employer feel that some modifications to the worksite may help. The job requires access to a large directory of employees which must be accessed quickly for visitors seeking a specific office or telephone number. There is considerable use of the telephone involved, and verbal assistance must occasionally be given to visitors.

Paul and his prospective employer have reviewed WORKSITE 1 and 2 illustrations on pages 5 and 7 to check for any major barriers in the general work environment. It is noted that the most serious barriers have already been removed, but door knobs will have to be replaced with levers.

They then reviewed further modifications as illustrated for functional limitations on pages 13 through 74. On the reverse side of each illustration are listed any disabilities which may require the modifications printed in dark over the WORKSITE illustration. Although Paul has cerebral palsy, he has no difficulty in interpreting information, no limitation of speech, no incoordination, or difficulty in moving his head; therefore, these modifications were not considered. His functional limitations which may affect job performance include poor balance, difficulty in using lower extremities, and difficulty in handling and fingering. The illustrations for these limitations (pp. 41, 39, 33, 73, 71, 65) suggested modifications which could help Paul be more independent at work.

Handle assists can be placed at the desk to aid him in sitting down and rising from the chair. The stool at the worksite can be replaced with one having full arms and a backrest. Quick access to the office directory is done with the aid of a microfilm viewer and a microfilm version of the directory. The viewer controls can be converted to push-button operation. A headset receiver will make use of the telephone easier. Paul and his employer agree that these modifications will be useful and cost-effective for this job/client match. In this situation, WORKSITE 1 was used. However, had the job required it, WORKSITE 2 illustrations might also have been helpful.

Counselors and evaluators will find DESIGNING FOR FUNCTIONAL LIMITATIONS helpful in job planning with their clients. Employers can use it in planning affirmative action programs. Designers and engineers, as well as students of these professions, can use it to plan environments and products more suitable for use by able and disabled consumers alike. DESIGNING FOR FUNCTIONAL LIMITATIONS is a workbook, not a textbook. It is offered in looseleaf format to encourage additions, notes, and convenient use. Your comments on its usefulness to you are welcome.
Guidelines presented in this resource should be freely adapted to the requirements of the worker and the worksite. Pictured below are actual worksites modified for disabled workers. In each case, the ideas of the worker, the employer, and the counselor were integrated to develop a more productive setting for disabled and non-disabled workers.

Photos by Innovative Services Unit, Vocational Rehabilitation Division, Portland, Oregon

Photos by Job Development Laboratory The George Washington University Washington, D.C.

Preparation line at fish processing plant modified for reach-impaired person.

Telephone survey clerk desk modified for worker with muscular dystrophy.

Dental technician site modified for worker with spinal cord injury.

Home worksite for insurance claims adjuster with spinal cord injury.
THE FUNCTIONAL LIMITATIONS

All disabilities, regardless of severity, can be functionally described as some combination of the following limitations:

- Difficulty in interpreting information p. 13
- Limitation of sight p. 15
- Limitation of hearing p. 17
- Limitation of speech p. 19
- Susceptibility to fainting, dizziness, seizures p. 21
- Incoordination p. 23
- Limitation of stamina p. 25
- Difficulty in moving head p. 27
- Limitation of sensation p. 29
- Difficulty in lifting and reaching with arms p. 31
- Difficulty in handling and fingering p. 33
- Inability to use upper extremities p. 35
- Difficulty in sitting p. 37
- Difficulty in using lower extremities p. 39
- Poor balance p. 41

In the following pages, the WORKSITE illustration is presented with additional guidelines for each of the above limitations.

This resource is intended to be used as a framework for planning the environment in cooperation with the disabled person, who knows his or her abilities best. Design suggestions for each limitation should be examined and evaluated with the specific environment and individual in mind. Use this resource as a guide to planning modifications for everyone concerned, and the result will be a more productive environment for disabled and non-disabled as well.
LOCATE LABELS, INSTRUCTIONS CLOSE TO REFERRED ITEM
USE SIMPLE WORDS, SYMBOLS AND/OR NUMBERS

DEFINE WORK ROUTINE AND TASK SEQUENCE CLEARLY
MINIMIZE NOISE, CLUTTER, AND OTHER DISTRACTIONS
ARRANGE MATERIALS IN ORDER OF USE

DIFFICULTY IN INTERPRETING INFORMATION
IS APPROX. 7% OF U.S. POPULATION
DIFFICULTY IN INTERPRETING INFORMATION

Persons with this limitation have limited understanding of spoken or written information. Approximately 7% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Cerebral Palsy
- Cerebrovascular Accidents (Stroke)
- Mental Retardation

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
ILLUMINATE SIGNS WELL
USE SIMPLE WORDS, SYMBOLS AND/OR NUMBERS

BOOKSTAND OR VIDEO READING AID
FOR EASIER READING.

ILLUMINATED MAGNIFIER

ENLARGED "TOUCHTONE" BUTTONS
AUDIBLE INDICATOR FOR MULTIPLE PHONE LINES

ROUGH-TEXTURED LEVERS INDICATE
EMERGENCY EXIT ONLY

DOORS TO HAZARDOUS AREAS
SHOULD BE KEPT LOCKED

ENTRANCE INDICATORS
2" x 1/8" (50 x 3mm) APPLIED STRIPS WITH 1/2" (13mm) SPACING
OR
1/8" (3mm) GROOVES IN SURFACE WITH 2" (50mm) SPACING

AVOID CONSTANT RELOCATION OF MATERIALS
USE BLACK FELT-TIP PENS FOR MAXIMUM LEGIBILITY
OR SENSORY PEN FOR WRITING OR DRAWING RAISED LINES
"TALKING" CALCULATOR FOR AUDIBLE COMPUTATION

MINIMIZE NOISE FOR BETTER COMMUNICATION
CONTRAST FURNITURE, DOORWAYS, ETC. WITH SURROUNDINGS BY COLOR AND BRIGHTNESS
MINIMIZE CLUTTER, DO NOT REMOVE "LANDMARKS" (FURNITURE, PARTITIONS) FOR NAVIGATION

MOTION BLUR
TS LESS THAN 1% OF U.S. POPULATION
LIMITATION OF SIGHT

Persons with this limitation include those who cannot read newspaper-sized print, are legally blind (20/200), have vision field defect of 10% or less, or have hemianopsia (one-sided vision). Less than 1% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Arthritis (Steroid Implications)
- Cancer
- Cataracts
- Cerebral Palsy
- Cerebrovascular Accidents (Hemianopsia)
- Congenital or Traumatic Blindness
- Diabetes Retinopathy
- Glaucoma
- Retina Degeneration
- Trauma
- Tunnel Vision

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

- BOOK STANDS
- BRAILLE COMMUNICATION SYSTEMS
- ILLUMINATED MAGNIFIERS
- LEVER DOOR HANDLES
- SENSORY PENS
- "TALKING" CALCULATOR
- TELEPHONE AIDS
- VIDEO READING AIDS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
CLEAR WRITTEN INSTRUCTIONS TO MINIMIZE NEED FOR VERBAL ASSISTANCE

TELEPHONE AIDS:
TELETYPE (TTY)
VISUAL CALL CUE
BONECONDUCTION RECEIVER

STORAGE CABINETS
FACE WORKSTATION TOWARD CO-WORKERS
AND OFFICE TRAFFIC FOR FACE-TO-FACE COMMUNICATION

CLEAN WRITTEN INSTRUCTIONS TO MINIMIZE NEED FOR VERBAL ASSISTANCE

LIMITATION ON EARLIER OCCURRED ON TRANSPARENT OVERLAYS.

AFFECTS 3% OF U.S. POPULATION

WORKSITE 1

IMPAIRMENT OF HEARING

LIMITATION OF HEARING

Persons with this limitation cannot understand usable speech with or without amplification. Approximately 3% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Agenesis of the Pinna
- Brain Damage
- Cancer
- Complications of Other Diseases
- Congenital or Traumatic Loss
- Otosclerosis

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

- TELEPHONE AIDS
- TELEPHONE AIDS FOR NON-VERBAL PERSONS (TTY)

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
MINIMIZE NOISE FOR BETTER COMMUNICATION

TELETYPE (TTY) FOR NON-VERBAL TELEPHONE COMMUNICATION

SPEECH COMPRESSOR/RECORDER FOR CLEARER RECORDED SPEECH
COMMUNICATOR OR SPEECH SYNTHESIZER AVAILABLE FOR NON-VERBAL PERSONS

FACE WORKSTATION TOWARD CO-WORKERS AND OFFICE TRAFFIC FOR FACE-TO-FACE COMMUNICATION

CLEAR WRITTEN INSTRUCTIONS TO MINIMIZE NEED FOR VERBAL ASSISTANCE

IMITATION OF SPEECH AFFECTS 4% OF U.S. POPULATION
LIMITATION OF SPEECH

Persons with this limitation have slow and/or indistinct speech, or use non-verbal communication. Approximately 4% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Brain Damage
- Cancer
- Cerebral Palsy
- Cerebrovascular Accidents (Stroke)
- Hearing Disorders

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

- SPEECH COMPRESSOR/RECORDERS
- SPEECH SYNTHESIZERS, COMMUNICATORS
- TELEPHONE AIDS FOR NON-VERBAL PERSONS (TTY)

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
Sudden noises or flashing lights may bring on seizures.

Interior signs

Lettering

Bar or handle assists firmly anchored wherever added support is needed.

Work station

Avoid secluded workstations.

Avoid need for bending down to reach or lift.

Seating

Adjustable height and support for chair back.

Wheeled cart or other aid for carrying materials.

Storage cabinets

Level of physical exertion should not vary greatly from day to day.

Note: If this limitation cannot be controlled by medication, avoid tasks in which this limitation might jeopardize the safety of others.

Specifications on this illustration suggest improvements to worksites which aid able-bodied as well as persons with sensory or lower extremity limitations.

Susceptibility to fainting, dizziness, seizures.

SApps, 2% of U.S. population.
SUSCEPTIBILITY TO FAINTING, DIZZINESS, SEIZURES

Persons with this limitation experience inducible or spontaneous fainting, dizziness, and/or seizures. Approximately 2% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

Cardiac Conditions
Cerebral Palsy
Epilepsy

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

BAR OR HANDLE ASSISTS
WHEELED CARTS, SHOULDER BAGS, CARRYING AIDS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
EASIER DOCUMENT ACCESS
USING BOOKSTAND,
MICROFILM VIEWER,
OR READING MACHINE
(SEE "CONTROLS" AT RIGHT)

TELEPHONE AIDS:
SPEAKERPHONE
HEADSET RECEIVER
ADJUSTABLE ARM FOR RECEIVER
ENLARGED "TOUCHTONE" BUTTONS

CONTROLS SHOULD BE LARGE AND WELL-SPACED
AVOID FINE CONTROL ADJUSTMENTS

BAR OR HANDLE ASSISTS
FIRMLY ANCHORED WHEREVER
ADDED STABILITY IS NEEDED

ELECTRIC, SELF-CORRECTING,
AUTO-RETURN TYPEWRITER
WITH KEYGUARD TO INCREASE
ACCURACY AND STABILITY
AND PAPER ROLL

CASSETTE TAPE RECORDER FOR
MESSAGES, MEMOS, DICTATION, ETC.

LIP AROUND EDGE OF WORK SURFACE TO KEEP MATERIALS FROM FALLING
KEEP WORK SURFACE AS CLEAR AS POSSIBLE
TOOLS AND MATERIALS SHOULD BE HEAVY AND DURABLE
MINIMIZE NEED FOR LONG REACH, STRETCHING UP, BENDING DOWN
USE BOLTS, CLAMPS, OR NON-SLIP MATS TO STABILIZE MATERIALS

COORDINATION
TS APPROX. 1% OF U.S. POPULATION
INCOORDINATION

Persons with this limitation experience lack of control in placing or directing their extremities (spasticity). Approximately 1% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Ataxia
- Cerebral Palsy
- Cerebrovascular Accidents
- Hemiplegia
- Multiple Sclerosis
- Parkinson's Disease

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

- BAR OR HANDLE ASSISTS
- BOOKSTANDS
- CASSETTE TAPE RECORDERS
- MICROFILM VIEWERS
- NON-SLIP MATS
- READING MACHINES
- TELEPHONE AIDS
- TYPEWRITERS
- TYPEWRITER KEYGUARDS, PAPER ROLLS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
AVOID EXTREMELY DRY AIR, EXTREME OR ABRUPT TEMPERATURE CHANGE
AVOID SMOKE, DUST, FUMES

BULKY OBJECTS SHOULD BE SLID RATHER THAN LIFTED

TELEPHONE AIDS:
- SPEAKERPHONE
- HEADSET-RECEIVER
- ADJUSTABLE ARM FOR RECEIVER

STORAGE CABINETS
AVOID SLICK SURFACES WHICH MAY BE USED FOR SUPPORT
USE BOLTS, CLAMPS, OR NON-SLIP MATS TO STABILIZE MATERIALS IN USE

MINIMIZE EMOTIONAL STRESS
AVOID FREQUENT CHANGES IN WORK SCHEDULE OR LEVEL OF PHYSICAL EXERTION
MINIMIZE (DO NOT ELIMINATE) REQUIREMENTS OF MOBILITY, REACH, LIFTING (MECHANICAL REACHERS, WHEELED CARTS MAY BE USED)

LIMITATION OF STAMINA
- WORKSITE 1

IS APPROX. 3% OF U.S. POPULATION
LIMITATION OF STAMINA

Persons with this limitation experience shortness of breath and/or abnormal elevation of blood pressure due to mild physical exertion. Approximately 3% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Asthma
- Arthritis
- Cardiac Conditions
- Cerebral Palsy
- Cerebrovascular Accidents (Stroke)
- Chronic Bronchitis
- Cystic Fibrosis
- Emphysema
- Hypertension
- Multiple Sclerosis
- Muscular Dystrophy
- Myasthenia Gravis
- Parkinson's Disease
- Renal Disease
- Scoliosis/Lordosis/Kyphosis
- Spinal Cord Injury
- Tuberculosis

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

- NON-SLIP MATS
- TELEPHONE AIDS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
WALLS

"FISHEYE" WINDOW INSERTS AND WALL MIRRORS TO INCREASE FIELD OF VIEW

BOOKSTAND FOR HOLDING DOCUMENTS AT COMFORTABLE READING ANGLE

TELEPHONE AIDS:
- SPEAKERPHONES
- HEADSET RECEIVER
- ADJUSTABLE ARM FOR RECEIVER

TYPEWRITER TILTED FOR BETTER VIEW OF COPY WORK

INTERIOR SIGNS

LETTERING

EMERGENCY

VISUAL WARNINGS: WITHIN FIELD OF VIEW

FLOORING

WORK STATION

DOORS

WORKSITE 1

STORAGE CABINETS

FACE WORKSTATION TOWARD CO-WORKERS AND OFFICE TRAFFIC FOR EASIER COMMUNICATION

SEATING

RECLINING SWIVEL CHAIR FOR WIDER FIELD OF VIEW

SPECIFICATIONS ON THIS ILLUSTRATION SUGGEST IMPROVEMENTS TO WORKSITES WHICH ARE DESCRIBED ON TRANSPARENT OVERLAYS.

5 APPROX. 6% OF U.S. POPULATION

RECLAIMED MATERIALS AND ENERGY EFFICIENCY ARE IMPORTANT."
DIFFICULTY IN MOVING HEAD

Persons with this limitation cannot easily look up, down, and/or to the side. Approximately 1% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Arthritis
- Cerebral Palsy
- Contractures due to Burns
- Muscular Dystrophy
- Neck Brace Wearers
- Parkinson's Disease
- Torticollis

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

- BOOKSTANDS
- "FISHEYE" WINDOW INSERTS AND WALL MIRRORS
- TELEPHONE AIDS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
WALLS
- Avoid floor outlets, phone terminals, or other projections.

INTERIOR SIGNS
- Exterior sign for an entrance to this building features accessible height.

LETTERING
- Use capital letters when possible.

TELEPHONES
- Located with a doel, on hand, on the side.

WORK STATION
- Avoid clutter.
- Avoid shallow drawers.
- Avoid slide hinges and catchers.
- Avoid extension cord, portable, or plug.

STORAGE CABINETS
- Drawers with knobs for easy operation.
- Shaped handles: 4" x 14"nominal x 1/4".

SEATING
- Adjustable height and support for lower back.
- Seat should rest on floor or other support.

AVOID SITTING FOR LONG PERIODS OF TIME

AVOID EXPOSED HEAT SOURCES

SPECIFICATIONS ON THIS ILLUSTRATION SUGGEST IMPROVEMENTS TO WORKSITE WHICH WILL AIDS ANDABLE AS WELL AS PERSONS WITH SENSORY OR LOWER EXTREMITY LIMITATIONS.
- Modifications may be required. Limitations are described on transparent overlays.

AFFECTS APPROX. 5% OF U.S. POPULATION
LIMITATION OF SENSATION

Persons with this limitation have impaired nerve reception (heat, touch, pain, pressure) in various parts of the body. Approximately 1% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Cerebrovascular Accidents (Stroke)
- Spinal Cord Injury
- Trauma

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
MECHANICAL "REACHERS" CAN AID IN OPERATION OF DOORS, FILES, WINDOWS, OTHER CONTROLS, AS WELL AS IN ACCESS TO MATERIALS

SPECIFICATIONS ON THIS ILLUSTRATION SUGGEST IMPROVEMENTS TO WORKSITES WHICH

WILL AID ABLE-BOUNDED AS WELL AS PERSONS WITH SENSORY OR LOWER EXTREMITY LIMITATIONS.

DIFFICULTY IN LIFTING AND REACHING WITH ARMS

ITS APPROX. 6% OF U.S. POPULATION
DIFFICULTY IN LIFTING AND REACHING WITH ARMS

Persons with this limitation experience decreased mobility, range of motion, and/or strength in their upper extremities. Approximately 6% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

Cardiac Conditions
Cerebral Palsy
Congenital Deformities
Multiple Sclerosis
Muscular Dystrophy
Spinal Cord Injury

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

LIGHT SWITCH EXTENSIONS
MECHANICAL "REACHERS"
OPEN DESK-TOP FILES AND STORAGE
TYPEWRITERS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
EASIER DOCUMENT ACCESS
USING BOOKSTAND,
MICROFILM VIEWER,
OR READING MACHINE
(SEE "CONTROLS" AT RIGHT)

TELEPHONE AIDS:
SPEAKERPHONE
HEADSET RECEIVER
ADJUSTABLE ARM FOR RECEIVER
ENLARGED "TOUCHTONE" BUTTONS

PEN/PENCIL
THROUGH RUBBER BALL OR
HARD FOAM FOR EASIER GRASP

CONTROLS:
OPTIMUM OPERATING FORCE: 3/4 LB (3.2 N)
PROVIDE AUDITORY/VISUAL FEEDBACK
AVOID SLICK, UNTEXTURED SURFACES
AVOID NEED FOR TWISTING MOTION
PUSH—BUTTON OR ROCKER PREFERENCES TO LEVER OR KNOB

ELECTRIC SELF—CORRECTING,
AUTO—RETURN TYPEWRITER
WITH KEYGUARD FOR GREATER
HAND SUPPORT AND ACCURACY
AND PAPER ROLL

CASSETTE TAPE RECORDER FOR
MESSAGES, MEMOS, DICTATION, ETC.

AVOID DRAWERS DEEPER THAN 12" (306mm)
OPEN DESK—TOP STORAGE PREFERABLE

BULKY OBJECTS SHOULD BE SLID RATHER THAN LIFTED
USE SLICK SURFACES FOR EASIER MOVEMENT OF MATERIALS
USE BOLTS, CLAMPS, OR NON—SLIP MATS WHERE STABILITY IS NEEDED

DIFFICULTY IN HANDLING AND FINGERING
AFFECTS APPROX. 1% OF U. S. POPULATION)
DIFFICULTY IN HANDLING AND FINGERING

Persons with this limitation experience decreased mobility, range of motion, and/or strength in their hands. Approximately 1% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Amputations
- Arthritis
- Bilateral Hemiparetic
- Cardiac Disorders
- Cerebral Palsy
- Cerebrovascular Accidents (Stroke)
- Congenital Deformities
- Dupuytren's Contracture
- Multiple Sclerosis
- Muscular Dystrophy
- Myasthenia Gravis
- Parkinson's Disease
- Polymyositis
- Severe Burns
- Spinal Cord Injury
- Syringomyelia

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

- BOOKSTANDS
- CASSETTE TAPE RECORDERS
- MICROFILM VIEWERS
- NON-SLIP MATS
- OPEN DESK-TOP FILES AND STORAGE
- READING MACHINES
- TELEPHONE AIDS
- TYPEWRITERS
- TYPEWRITER KEYGUARDS, PAPER ROLLS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
PERSONS WITH THIS LIMITATION MAY COMPENSATE THROUGH USE OF A MOUTHSTICK, THEIR FEET, OR ELECTRO-MECHANICAL AIDS.

ENVIRONMENTAL CONTROL SYSTEMS ARE AVAILABLE FOR OPERATION OF TELEPHONE, DOOR, LIGHTING, OR OTHER ELECTRICAL APPLIANCES.

SPECIFICATIONS ON THIS ILLUSTRATION SUGGEST IMPROVEMENTS TO WORKSITES WHICH WILL AID ABLE-ROCKED AS WELL AS PERSONS WITH SENSORY OR LOWER EXTREMITY LIMITATIONS.

ABILITY TO USE UPPER EXTREMITIES AFFECTS APPROX. 2% OF U.S. POPULATION.
INABILITY TO USE UPPER EXTREMITIES

Persons with this limitation experience complete paralysis, severe incoordination, or loss of upper extremities. Approximately 2% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Amputations
- Arthritis
- Cerebral Palsy
- Congenital Deformities
- Polio
- Spinal Cord Injury

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

- BOOKSTANDS
- CASSETTE TAPE RECORDERS
- DOOR OPENERS
- ENVIRONMENTAL CONTROLS
- MICROFILM VIEWERS

- OPEN DESK-TOP FILES AND STORAGE
- READING MACHINES
- SOUND-OPERATED AND OTHER REMOTE SWITCHES
- TELEPHONE AIDS
- TYPEWRITERS
- TYPEWRITER KEYGUARDS, PAPER ROLLS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
BULKY OBJECTS SHOULD BE SLID RATHER THAN LIFTED

MINIMIZE NEED FOR REACHING UP OR BENDING DOWN

SEATING WITH FULL ARMS AND BACKREST, STABLE BASE

SEAT BELTS AND/OR CUSHIONS FOR ADDDED STABILITY

FICULTY IN SITTING AFFECTS APPROX. 5% OF U.S. POPULATION

IT IS APPRX. 5% OF U.S. POPULATION
DIFFICULTY IN SITTING

Persons with this limitation experience lack of strength, restriction of motion, and/or lack of trunk control in bending, turning, or balance. Approximately 5% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Arthritis of the Spine or Hips
- Congenital Deformities
- Scoliosis/Kyphosis/Lordosis
- Spinal Cord Injury

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
WALLS

INTERIOR SIGNS

TELEPHONES

LOCATION OF HANDICAP ROOMS

FLOORS

WORK STATION

STORAGE CABINETS

SEATING

SPECIFICATIONS ON THIS ILLUSTRATION SUGGEST IMPROVEMENTS WHICH WILL AID ABLE-BODIED AS WELL AS PERSONS WITH SENSORY OR LOWER EXTREMITY LIMITATIONS: 40% OF U.S. POPULATION AFFECTS APPROX. 4% OF U.S. POPULATION

NOTE: FOR PERSONS USING WHEELCHAIRS, THE FOLLOWING ADDITIONAL MODIFICATIONS ARE NEEDED TO WORK SITE.
DIFFICULTY IN USING LOWER EXTREMITIES

Persons with this limitation experience slowness of gait, impairment of kneeling, rising, walking, standing, and/or stair-climbing. Approximately 4% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Arthritis
- Cancer
- Cardiac Disorders
- Cerebral Palsy
- Cerebrovascular Accidents (Stroke)
- Congenital Deformities
- Hemophilia
- Multiple Sclerosis
- Muscular Dystrophy
- Parkinson's Disease
- Spina Bifida
- Spinal Cord Injury

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

- BAR OR HANDLE ASSISTS
- CANE/CRUTCH STORAGE CLIPS
- RISING-ASSIST CHAIRS
- WHEELED CARTS, SHOULDER BAGS, CARRYING AIDS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
BAR OR HANDLE ASSISTS
FIRMLY ANCHORED WHEREVER
ADDED SUPPORT IS NEEDED

STORAGE CABINETS
AVOID SLICK SURFACES WHICH MAY BE USED FOR SUPPORT.
MINIMIZE NEED FOR REACHING UP OR BENDING DOWN

AVOID DRAWERS DEEPER THAN 12" (305mm)

ALLOW AMPLE, UNCLUTTERED AISLE SPACE
MINIMIZE NEED FOR STANDING, WALKING, CARRYING
SEATING WITH FULL ARMS AND BACKREST, STABLE BASE

OR BALANCE
IS APPROX. 2% OF U.S. POPULATION
POOR BALANCE

Persons with this limitation find it difficult or impossible to maintain balance when moving or when stationary (standing, walking, rising, stair climbing). Approximately 2% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Amputations
- Ataxia
- Cerebral Palsy
- Cerebrovascular Accidents (Stroke)
- Deafness
- Dystonia Musculorum Deformans
- Multiple Sclerosis
- Muscular Dystrophy
- Parkinson's Disease
- Spinal Cord Injury

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

BAR OR HANDLE ASSISTS
WHEELED CARTS, SHOULDER BAGS, CARRYING AIDS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
The Functional Limitations

All disabilities, regardless of severity, can be functionally described as some combination of the following limitations:

- Difficulty in interpreting information p. 45
- Limitation of sight p. 47
- Limitation of hearing p. 49
- Limitation of speech p. 51
- Susceptibility to fainting, dizziness, seizures p. 53
- Incoordination p. 55
- Limitation of stamina p. 57
- Difficulty in moving head p. 59
- Limitation of sensation p. 61
- Difficulty in lifting and reaching with arms p. 63
- Difficulty in handling and fingering p. 65
- Inability to use upper extremities p. 67
- Difficulty in sitting p. 69
- Difficulty in using lower extremities p. 71
- Poor balance p. 73

In the following pages, the WORKSITE illustration is presented with additional guidelines for each of the above limitations.

This resource is intended to be used as a framework for planning the environment in cooperation with the disabled person, who knows his or her abilities best. Design suggestions for each limitation should be examined and evaluated with the specific environment and individual in mind. Use this resource as a guide to planning modifications for everyone concerned, and the result will be a more productive environment for disabled and non-disabled as well.
DIFFICULTY IN INTERPRETING INFORMATION

Persons with this limitation have limited understanding of spoken or written information. Approximately 7% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Cerebral Palsy
- Cerebrovascular Accidents (Stroke)
- Mental Retardation

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
ILLUMINATE SIGNS WELL USE SIMPLE WORDS, SYMBOLS, AND/OR NUMBERS

AUDIBLE INDICATOR FOR MULTIPLE PHONE LINES

ROUGH-TEXTURED LEVERS INDICATE EMERGENCY EXIT ONLY

DOORS TO HAZARDOUS AREAS SHOULD BE KEPT LOCKED

ENTRANCE INDICATORS 2" x 1/8" (50 x 3mm) APPLIED STRIPS WITH 1/2" (13mm) SPACING OR 1/8" (3mm) GROOVES IN SURFACE WITH 2" (50mm) SPACING

EQUIPMENT CONTROLS CONTROLS SHOULD BE WELL-SPACED AND CONTRASTED

TEXTURED CONTROL INDICATORS SHOULD BE NEXT TO CONTROL NOT ON IT

AVOID BLINKING LIGHTS

- AVOID TOUCH-SENSITIVE SWITCHES

CONTRAST FURNITURE, DOORWAYS, ETC. WITH SURROUNDINGS BY COLOR AND BRIGHTNESS

MINIMIZE CLUTTER, DO NOT REMOVE ALL "LANDMARKS" (FURNITURE, PARTITIONS) FOR NAVIGATION

CONTRAST FURNITURE, DOORWAYS, ETC. WITH SURROUNDINGS BY COLOR AND BRIGHTNESS

MINIMIZE CLUTTER, DO NOT REMOVE ALL "LANDMARKS" (FURNITURE, PARTITIONS) FOR NAVIGATION

MINIMIZE NOISE FOR BETTER COMMUNICATION

AVOID CONSTANT RELOCATION OF MATERIALS

USE BLACK FELT-TIP PENS FOR MAXIMUM LEGIBILITY OR SENSORY PEN FOR WRITING OR DRAWING RAISED LINES

TELEPHONES

ILLUMINATED MAGNIFIER

USE BLACK FELT-TIP PENS FOR MAXIMUM LEGIBILITY OR SENSORY PEN FOR WRITING OR DRAWING RAISED LINES

AVOID TOUCH-SENSITIVE SWITCHES

CONTRAST FURNITURE, DOORWAYS, ETC. WITH SURROUNDINGS BY COLOR AND BRIGHTNESS

MINIMIZE CLUTTER, DO NOT REMOVE ALL "LANDMARKS" (FURNITURE, PARTITIONS) FOR NAVIGATION

MINIMIZE NOISE FOR BETTER COMMUNICATION

AVOID CONSTANT RELOCATION OF MATERIALS

USE BLACK FELT-TIP PENS FOR MAXIMUM LEGIBILITY OR SENSORY PEN FOR WRITING OR DRAWING RAISED LINES

TELEPHONES

ILLUMINATED MAGNIFIER

USE BLACK FELT-TIP PENS FOR MAXIMUM LEGIBILITY OR SENSORY PEN FOR WRITING OR DRAWING RAISED LINES

AVOID TOUCH-SENSITIVE SWITCHES

CONTRAST FURNITURE, DOORWAYS, ETC. WITH SURROUNDINGS BY COLOR AND BRIGHTNESS

MINIMIZE CLUTTER, DO NOT REMOVE ALL "LANDMARKS" (FURNITURE, PARTITIONS) FOR NAVIGATION

MINIMIZE NOISE FOR BETTER COMMUNICATION

AVOID CONSTANT RELOCATION OF MATERIALS

USE BLACK FELT-TIP PENS FOR MAXIMUM LEGIBILITY OR SENSORY PEN FOR WRITING OR DRAWING RAISED LINES

TELEPHONES

ILLUMINATED MAGNIFIER
LIMITATION OF SIGHT

Persons with this limitation include those who cannot read newspaper-sized print, are legally blind (20/200), have vision field defect of 10% or less, or have hemianopsia (one-sided vision). Less than 1% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Arthritis (Steroid Implications)
- Cancer
- Cataracts
- Cerebral Palsy
- Cerebrovascular Accidents (Hemianopsia)
- Congenital or Traumatic Blindness
- Diabetes Retinopathy
- Glaucoma
- Retina Degeneration
- Trauma
- Tunnel Vision

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

- BOOK STANDS
- BRAILLE COMMUNICATION SYSTEMS
- ILLUMINATED MAGNIFIERS
- LEVER DOOR HANDLES
- SENSORY PENS
- "TALKING" CALCULATOR
- TELEPHONE AIDS
- VIDEO READING AIDS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
TELEPHONE AIDS:
TELETYPewriter (TTY)
VISUAL CALL CUE
BONE CONDUCTOR RECEIVER

VISUAL CONTROL FEEDBACK AND ALARMS

FACE WORKSTATION TOWARD CO-WORKERS FOR FACE-TO-FACE COMMUNICATION

CLEAR WRITTEN INSTRUCTIONS TO MINIMIZE NEED FOR VERBAL ASSISTANCE

IMATION OF HEARING IMPAIRMENT OR EXTREMITY LIMITATIONS WHICH
AFFECT 3% OF U.S. POPULATION

WORKSITE 2
LIMITATION OF HEARING

Persons with this limitation cannot understand usable speech with or without amplification. Approximately 3% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Agenesis of the Pinna
- Brain Damage
- Cancer
- Complications of Other Diseases
- Congenital or Traumatic Loss
- Otosclerosis

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

- TELEPHONE AIDS
- TELEPHONE AIDS FOR NON-VERBAL PERSONS (TTY)

Further modifications to WORKSITE for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
MINIMIZE NOISE FOR BETTER COMMUNICATION

TELETYPE (TTY) FOR NON-VERBAL TELEPHONE CONVERSATION

SPEECH SYNTHESIZER OR COMMUNICATOR FOR NON-VERBAL PERSONS

FACE WORKSTATION TOWARD CO-WORKERS FOR FACE-TO-FACE COMMUNICATION

CLEAR WRITTEN INSTRUCTIONS TO MINIMIZE NEED FOR VERBAL ASSISTANCE

LIMITATION: OF SPEECH TRANSCRIPTION OVERLAYS AFFECTS APPROX. 4% OF US. POPULATION

WORKSITE 2
LIMITATION OF SPEECH

Persons with this limitation have slow and/or indistinct speech, or use non-verbal communication. Approximately 4% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Brain Damage
- Cancer
- Cerebral Palsy
- Cerebrovascular Accidents (Stroke)
- Hearing Disorders

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

- SPEECH COMPRESSOR/RECORDERS
- SPEECH SYNTHESIZERS, COMMUNICATORS
- TELEPHONE AIDS FOR NON-VERBAL PERSONS (TTY)

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
LEVEL OF PHYSICAL EXERTION SHOULD NOT VARY GREATLY FROM DAY TO DAY

NOTE: IF THIS LIMITATION CANNOT BE CONTROLLED BY MEDICATION, AVOID TASKS IN WHICH THIS LIMITATION MIGHT JEOPARDIZE THE SAFETY OF OTHERS

SUSCEPTIBILITY TO FAINTING, DIZZINESS, SEIZURES

5 APPROX. 2% OF U.S. POPULATION
Susceptibility to Fainting, Dizziness, Seizures

Persons with this limitation experience inducible or spontaneous fainting, dizziness, and/or seizures. Approximately 2% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Cardiac Conditions
- Cerebral Palsy
- Epilepsy

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

- BAR OR HANDLE ASSISTS
- WHEELED CARTS, SHOULDER BAGS, CARRYING AIDS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
TELEPHONE AIDS:
- SPEAKERPHONE
- HEADSET RECEIVER
- ADJUSTABLE ARM FOR RECEIVER
- ENLARGED “TOUCHTONE” BUTTONS

BAR OR HANDLE ASSISTS FIRMLY ANCHORED WHEREVER ADDED SUPPORT IS NEEDED

USE FIXTURES, GUIDES, NON-SLIP MATS TO STABILIZE MATERIALS

TOOLS AND MATERIALS SHOULD BE HEAVY AND DURABLE

CONTROLS SHOULD BE WELL-SPACED
GUARDS ON CONTROLS TO AVOID ACCIDENTAL ACTIVATION
AVOID SIMULTANEOUS CONTROL FUNCTIONS
AVOID FINE CONTROL ADJUSTMENTS
AVOID TOUCH-SENSITIVE CONTROLS

KEEP WORKSURFACE AS CLEAR AS POSSIBLE

LIP ON EDGE OF WORKSURFACE TO KEEP MATERIALS FROM FALLING
MINIMIZE NEED FOR LONG REACH, STRETCHING UP, BENDING DOWN

COORDINATION'S APPROX. 1% OF U.S. POPULATION

WORKSITE 2
INCOORDINATION

Persons with this limitation experience lack of control in placing or directing their extremities (spasticity). Approximately 1% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Ataxia
- Cerebral Palsy
- Cerebrovascular Accidents
- Hemiplegia
- Multiple Sclerosis
- Parkinson's Disease

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

| BAR OR HANDLE ASSISTS | READING MACHINES |
| BOOKSTANDS            | TELEPHONE AIDS   |
| CASSETTE TAPE RECORDERS | TYPEWRITERS       |
| MICROFILM VIEWERS     | TYPEWRITER KEYGUARDS, PAPER ROLLS |
| NON-SLIP MATS         |                   |

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
Avoid extremely dry air, extreme or abrupt temperature change.
Avoid smoke, dust, fumes.

Bulky objects should be slid rather than lifted.

Max. activating force: 2 lb (8.9 N)

Minimize stretching, kneeling, bending down.
Avoid slick surfaces which may be used for support.
Use bolts, clamps, fixtures, or non-slip mats to stabilize materials in use.

Minimize emotional stress.
Avoid frequent changes in work schedule or level of physical exertion.

Minimize (do not eliminate) requirements of mobility, reach, lifting (mechanical reachers, wheeled carts may be used)

Fatigue of stamina affects approx. 3% of U.S. population
LIMITATION OF STAMINA

Persons with this limitation experience shortness of breath and/or abnormal elevation of blood pressure due to mild physical exertion. Approximately 3% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Asthma
- Arthritis
- Cardiac Conditions
- Cerebral Palsy
- Cerebrovascular Accidents (Stroke)
- Chronic Bronchitis
- Cystic Fibrosis
- Emphysema
- Hypertension
- Multiple Sclerosis
- Muscular Dystrophy
- Myasthenia Gravis
- Parkinson's Disease
- Renal Disease
- Scoliosis/Lordosis/Kyphosis
- Spinal Cord Injury
- Tuberculosis

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

- NON-SLIP MATS
- TELEPHONE AIDS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
"FISHEYE" WINDOW INSERTS AND WALL MIRRORS TO INCREASE FIELD OF VIEW

WORKSTANDS TO LOCATE MATERIALS WITHIN COMFORTABLE VIEW

AVOID DRAWERS, STORAGE DEEPER THAN 12" (305mm) MINIMIZE REACH UP, DOWN, OR BEHIND

CONSOLIDATE CONTROLS, INFORMATION DISPLAYS 35—54" (875—1372mm) ABOVE FLOOR "AVOID SIMULTANEOUS CONTROLS"

RECLINING SWIVEL SEATING FOR WIDER FIELD OF VIEW
FACE WORKSTATION TOWARD CO-WORKERS FOR FACE-TO-FACE COMMUNICATION

LIMITATIONS, DIFFICULTY MOVING, AND AID TO TRANSFER OVERlays AFFECTS APPROX. 1% OF U.S. POPULATION
DIFFICULTY IN MOVING HEAD

Persons with this limitation cannot easily look up, down, and/or to the side. Approximately 1% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Arthritis
- Cerebral Palsy
- Contractures due to Burns
- Muscular Dystrophy
- Neck Brace Wearers
- Parkinson's Disease
- Torticollis

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

- BOOKSTANDS
- "FISHEYE" WINDOW INSERTS AND WALL MIRRORS
- TELEPHONE AIDS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
AVOID SITTING FOR LONG PERIODS OF TIME

AVOID FLOOR OUTLETS, PHONE TERMINALS, etc. which are described on transparent overlays.

AFFECTS APPROX. 1% OF U.S. POPULATION

LIMITATIONS & INDEPENDENT LIMITATIONS ARE DESCRIBED ON TRANSPARENT OVERLAYS.

WORKSITE 2

WORK STATION

EQUIPMENT CONTROLS

TELEPHONES

STORAGE FOR HAZARDOUS MATERIALS AND SHARP OBJECTS, ETC. Should be clearly labelled.

DOORS

FLOORS

AVOID EXPOSED HEAT SOURCES.

AVOID FLOOR OUTLETS, PHONE TERMINALS, etc. which are described on transparent overlays.

SPECIFICATIONS ON THIS ILLUSTRATION SUCH AS MOUNTING HEIGHTS TO WORKSTATIONS WHICH ARE DESCRIBED ON TRANSPARENT OVERLAYS.
LIMITATION OF SENSATION

Persons with this limitation have impaired nerve reception (heat, touch, pain, pressure) in various parts of the body. Approximately 1% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Cerebrovascular Accidents (Stroke)
- Spinal Cord Injury
- Trauma

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
AVOID CABINETS WITH DOORS THAT HINGE UP OR DOWN

OBJECTS GREATER THAN 2 LBS (0.9Kg) SHOULD BE SLID RATHER THAN LIFTED

DUPLICATE TACTILE SIGNAGE 30" (75mm) ABOVE FLOOR IF NEEDED

TELEPHONE AIDS:
- SPEAKERPHONE
- HEADSET-RECEIVER
- ADJUSTABLE ARM FOR RECEIVER
- AVOID-DRAWERS DEEPER THAN 12" (305mm)
- 36" (914mm) OR SWITCH EXTENSION
- 29" (737mm) MAX.

ARRANGE MATERIALS WITHIN 18" (457mm) REACH IF POSSIBLE

MECHANICAL "REACHERS" CAN AID IN OPERATION OF DOORS, HINGES, WINDOWS, OTHER CONTROLS, AS WELL AS IN ACCESS TO MATERIALS

AFFECTS APPROX. 6% OF U.S. POPULATION

WORK STATION

DOORS

EQUIPMENT CONTROLS

FACULTY IN LIFTING AND REACHING WITH ARMS

WOR/site 2

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DIFFICULTY IN LIFTING AND REACHING WITH ARMS

Persons with this limitation experience decreased mobility, range of motion, and/or strength in their upper extremities. Approximately 6% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

Cardiac Conditions
Cerebral Palsy
Congenital Deformities
Multiple Sclerosis
Muscular Dystrophy
Spinal Cord Injury

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

LIGHT SWITCH EXTENSIONS
MECHANICAL "REACHERS"
OPEN DESK-TOP FILES AND STORAGE
TYPEWRITERS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
AVOID LATCHES ON STORAGE CABINETS

TELEPHONE AIDS:
SPEAKERPHONE
HEADSET RECEIVER
ADJUSTABLE ARM FOR RECEIVER

PEN/PENCIL THROUGH RUBBER BALL
OR HARD FOAM FOR EASIER GRASP

TOOL STANDS/HOLDERS MAKE GRASP EASIER

BULky OBJECTS SHOULD BE SLID
RATHER THAN LIFTED

PUSH—BUTTON OR ROCKER TYPE PREFERENCES TO LEVER OR KNOB
OPTIMUM OPERATING FORCE: 3/4 LB (3.2 N)
AVOID NEED FOR ROTATING MOTION
AVOID SLICK, UNTEXTURED CONTROL SURFACES

USE SLICK WORKSURFACES FOR EASIER MOVEMENT OF MATERIALS
USE BOLTS, CLAMPS, OR NON—SLIP MATS WHERE STABILITY IS NEEDED

FICULTY IN HANDLING AND FINGERING
S APPROX. 1% OF U.S. POPULATION
DIFFICULTY IN HANDLING AND FINGERING

Persons with this limitation experience decreased mobility, range of motion, and/or strength in their hands. Approximately 1% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Amputations
- Arthritis
- Bilateral Hemiparetic
- Cardiac Disorders
- Cerebral Palsy
- Cerebrovascular Accidents (Stroke)
- Congenital Deformities
- Dupuytren's Contracture
- Multiple Sclerosis
- Muscular Dystrophy
- Myasthenia Gravis
- Parkinson's Disease
- Polymyositis
- Severe Burns
- Spinal Cord Injury
- Syringomyelia

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

- BOOKSTANDS
- CASSETTE TAPE RECORDERS
- MICROFILM VIEWERS
- NON-SLIP MATS
- OPEN DESK-TOP FILES AND STORAGE
- READING MACHINES
- TELEPHONE AIDS
- TYPEWRITERS
- TYPEWRITER KEYGUARDS, PAPER ROLLS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
PERSONS WITH THIS LIMITATION MAY COMPENSATE THROUGH USE OF A MOUTHSTICK, THEIR FEET, OR ELECTRO-MECHANICAL AIDS.

ENVIRONMENTAL CONTROL SYSTEMS ARE AVAILABLE FOR OPERATION OF TELEPHONE, DOOR, LIGHTING, OR OTHER ELECTRICAL APPLIANCES.

ABILITIES TO USE UPPER EXTREMITIES IS APPROX. 2% OF U.S. POPULATION

WORKSURFACE SHOULD BE RAISED OR LOWERED FOR WORKING WITH FEET OR MOUTHSTICK.

USE SLICK SURFACES FOR EASIER MOVEMENT OF MATERIALS.
INABILITY TO USE UPPER EXTREMITIES

Persons with this limitation experience complete paralysis, severe incoordination, or loss of upper extremities. Approximately 2% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Amputations
- Arthritis
- Cerebral Palsy
- Congenital Deformities
- Polio
- Spinal Cord Injury

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

- BOOKSTANDS
- CASSETTE TAPE RECORDERS
- DOOR OPENERS
- ENVIRONMENTAL CONTROLS
- MICROFILM VIEWERS
- OPEN DESK-TOP FILES AND STORAGE
- READING MACHINES
- SOUND-OPERATED AND OTHER REMOTE SWITCHES
- TELEPHONE AIDS
- TYPEWRITERS
- TYPEWRITER KEYGUARDS, PAPER ROLLS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
BULKY OBJECTS SHOULD BE SLID RATHER THAN LIFTED

MINIMIZE NEED FOR REACHING UP OR BENDING DOWN

SEATING WITH FULL ARMS AND BACKREST, STABLE BASE
SEAT BELTS AND/OR CUSHIONS FOR ADDED STABILITY

DIFFICULTY IN SITTING AFFECTS APPROX. 5% OF U.S. POPULATION
DIFFICULTY IN SITTING

Persons with this limitation experience lack of strength, restriction of motion, and/or lack of trunk control in bending, turning, or balance. Approximately 5% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Arthritis of the Spine or Hips
- Congenital Deformities
- Scoliosis/Kyphosis/Lordosis
- Spinal Cord Injury

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
BAR OR HANDLE ASSISTS FIRMLY ANCHORED WHEREVER ADDED SUPPORT IS NEEDED

PROVIDE CONVENIENT STORAGE FOR WALKING AIDS AT WORKSTATION.

SHOULDER BAG, CRUTCH BAG, OR OTHER AID FOR CARRYING MATERIALS

AVOID NEED FOR CARRYING HEAVY OBJECTS (INHIBITS POSTURE)

AVOID CONTROLS REQUIRING BOTH HANDS

NOTE:
FOR PERSONS USING WHEELCHAIRS RATHER THAN WALKING AIDS, NO FURTHER MODIFICATIONS ARE NECESSARY TO WORKSITE 2

SEATING WITH FULL ARMS AND BACKREST (SWIVEL, CASTER BASE MAY AID SOME PERSONS) OR RISING—ASSIST CHAIR

DIFFICULTY IN USING LOWER EXTREMITIES AFFECTS APPROX. 4% OF U.S. POPULATION

WORKSITE 2
DIFFICULTY IN USING LOWER EXTREMITIES

Persons with this limitation experience slowness of gait, impairment of kneeling, rising, walking, standing, and/or stair-climbing. Approximately 4% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Arthritis
- Parkinson's Disease
- Cancer
- Spina Bifida
- Cardiac Disorders
- Spinal Cord Injury
- Cerebral Palsy
- Cerebrovascular Accidents (Stroke)
- Congenital Deformities
- Hemophilia
- Multiple Sclerosis
- Muscular Dystrophy
- Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:
  - BAR OR HANDLE ASSISTS
  - CANE/CRUTCH STORAGE CLIPS
  - RISING-ASSIST CHAIRS
  - WHEELED CARTS, SHOULDER BAGS, CARRYING AIDS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
AVOID SLICK SURFACES WHICH MAY BE USED FOR SUPPORT
BAR OR HANDLE ASSISTS FIRMLY ANCHORED WHEREVER ADDED SUPPORT IS NEEDED

AVOID DRAWERS DEEPER THAN 12” (305mm)

OPTIMUM ACTIVATING FORCE: 2LB (8.9N)

WORK STATION
MINIMIZE NEED FOR STANDING, WALKING, CARRYING
MINIMIZE NEED FOR REACHING UP OR BENDING DOWN
SEATING WITH FULL ARMS AND BACKREST, STABLE BASE

DOORS
FLOORS

ALLOW AMPLE, UNCLUTTERED AISLE SPACE

OR BALANCE IS APPX. 2% OF U.S. POPULATION
POOR BALANCE

Persons with this limitation find it difficult or impossible to maintain balance when moving or when stationary (standing, walking, rising, stair climbing). Approximately 2% of the U.S. population is affected to some degree (National Academy of Sciences, 1976).

This limitation may be experienced by persons having any of the following disabilities:

- Amputations
- Ataxia
- Cerebral Palsy
- Cerebrovascular Accidents (Stroke)
- Deafness
- Dystonia Musculorum Deformans
- Multiple Sclerosis
- Muscular Dystrophy
- Parkinson's Disease
- Spinal Cord Injury

Aids suggested on the illustration below have been used by persons having this limitation. No endorsement of specific products is intended. The reader is encouraged to obtain further information from suppliers listed in the appendix under the following product headings:

BAR OR HANDLE ASSISTS
WHEELED CARTS, SHOULDER BAGS, CARRYING AIDS

Further modifications to WORKSITE 1 for persons having this limitation are suggested on the illustration. Each one should be selected, amended, or rejected according to the expressed needs of the individual and the job.
PRODUCT SUPPLIER INFORMATION

SPECIFIC PRODUCT INFORMATION CONCERNING AIDS AND DEVICES MENTIONED IN THIS RESOURCE CAN BE OBTAINED FROM THESE SUPPLIERS:

BAR OR HANDLE ASSISTS
Fred Sammons, Inc., Box 32, Brookfield, IL 60513
G.E. Miller, 484 S. Broadway, Yonkers, NY 10705
Lumex, Inc., 100 Spence St., Bay Shore, NY 11706
Tubular Specialties Manufacturing, Inc., 8119 South Beach St., P.O. Box 71527 Florence Branch, Los Angeles, CA 90001

BOOKSTANDS
Abbey Medical Equipment 800-421-1170
APARCO, Inc., 215 A Street, Boston, MA 02210
FashionAble, Rocky Hill, NJ 08553
Fred Sammons, Inc., Box 32, Brookfield, IL 60513
G.E. Miller, 484 S. Broadway, Yonkers, NY 10705
Maddak, Inc., Pequannock, NJ 07440

BRADLE COMMUNICATION SYSTEMS
Elinfa, Inc., Suite 1114, 1725 "K" St., N.W., Washington, D.C. 20006

CANE/CRUTCH STORAGE CLIPS
Fred Sammons, Inc., Box 32, Brookfield, IL 60513
Maddak, Inc., Pequannock, NJ 07440

CASSETTE TAPE RECORDERS
Grundig 2050 Stenorette (uses only Grundig Cassettes), GRUNDIG International, Ltd, Newlands Park, London SE26 5NQ
Panasonic RQ-212DAS Recorder, Matsushita Electric Corp. of America, 1 Panasonic Way, Secaucus, NJ 07094
Sony TC-205 Recorder, Sony Corp. of America, 9 West 57th St., New York, NY 10019

COMMUNICATION AIDS FOR NON-VERBAL PERSONS
Prentke Romich Co., RD2, Box 191, Shreve, Ohio 44676
Telesensory Systems, Inc., 3408 Hillview Ave., P.O. Box 10099, Palo Alto, CA 94304
"VIP" and "Talking Focket", Automated Data Systems, Inc., P.O. Box 4062, Madison, WI 53711
Zygo Industries, Inc., P.O. Box 1008, Portland, OR 97207

COMMUNICATION AIDS FOR NON-VERBAL PERSONS
Prentke Romich Co., RD2, Box 191, Shreve, Ohio 44676
Telesensory Systems, Inc., 3408 Hillview Ave., P.O. Box 10099, Palo Alto, CA 94304
"VIP" and "Talking Focket", Automated Data Systems, Inc., P.O. Box 4062, Madison, WI 53711
Zygo Industries, Inc., P.O. Box 1008, Portland, OR 97207

DOOR OPENERS
LCN Closers, Railroad Ave., Princeton, IL 61356
Overhead Door Corp., 6250 LBJ Freeway, Dallas, TX 75204
Power Access Corp., 96 Birch Ave., Little Silver, NJ 07739
Prentke Romich Co., RD 2, Box 191, Shreve, Ohio 44676
Securitron Magnalock Corp., P.O. Box 49875, Los Angeles, CA 90049
The Stanley Works, Farmington, CT 06032

ENVIRONMENTAL CONTROLS
BARD/CARBA, Div. of C.R. Bard, Inc., 731 Central Ave., Murray Hill, NJ 07974
Down East Manufacturing Co., 44 Bucknam Road, Falmouth, ME 04105
Fidelity Electronics, Ltd, 5245 Diversey Ave., Chicago, IL 60639
Maddak, Inc., Pequannock, NJ 07440
Possum, Inc., East Coast Division, P.O. Box 451, Midwood Station, Brooklyn, NY 11230
Prentke Romich Co., RD2, Box 191, Shreve, Ohio 44676
Technical Aids to Independence, 12 Hyde Rd., Bloomfield, NJ 07003

"FISHEYE" WINDOW INSERTS AND WALL MIRRORS
Miles Kimball Co., 41 West 8th Ave., Oshkosh, WI 54901
"Lensor" #40740, The Gallery, Wallins Corners Road, Amsterdam, NY 12010
The Highsmith Co., Inc., P.O. Box 25, Highway 106 East, Fort Atkinson, WI 53538

ILLUMINATED MAGNIFIERS
Atlantic Office Supply Co., Inc., 4907 Annapolis Road, Bladensburg, MD 20710
Luxo Lamp Corp., Purdy Ave., Port Chester, NY 10573
Vision Systems Division, The EdnaLite Corp., Ande Building, Peekskill, NY 10566

LEVER DOOR HANDLES
Schlage Locks, 2401 Bayshore Blvd., San Francisco, CA 94119

LIGHT SWITCH EXTENSIONS
Fred Sammons, Inc., Box 32, Brookfield, IL 60513
Maddak, Inc., Pequannock, NJ 07440

MECHANICAL "REACHERS"
FashionAble, Rocky Hill, NJ 08553
Fred Sammons, Inc., Box 32, Brookfield, IL 60513
G.E. Miller, 484 S. Broadway, Yonkers, NY 10705
Maddak, Inc., Pequannock, NJ 07440

MICROFILM VIEWERS
Devoke Co., 3783 Fabian Way, P.O. Box 10011, Palo Alto, CA 94303
NCR, 365 South Oak, West Salem, WI 53405
The Dietzgen Corp., 250 West Willie Road, Des Plaines, IL 60016
NON-SLIP MATS
"Dycem", Fred Sammons, Inc., Box 32, Brookfield, IL 60513
"Vikem", Maddak, Inc., Pequannock, NJ 07440

ONE-HAND TYPEWRITERS
Typewriting Institute for the Handicapped, 3102 West Augusta Ave., Phoenix, AZ 85021

OPEN DESK-TOP FILES AND STORAGE
Atlantic Office Supply, Inc., 4907 Annapolis Road, Bladensburg, MD 20710
The Highsmith Co., Inc., P.O. Box 25, Highway 106 East, Port Atkinson, WI 53538
Wilson-Jones, 6150 W. Touhy Ave., Chicago, IL 60648

READING MACHINES
The Ealing Corp., 22 Pleasant St., South Natick, MA 01760

RISING-ASSIST CHAIR
Economy Easy-Lift Chair, American Stair-Glide Corp., 4001 East 138th St., Grandview, MO 64030
Vela Catapult Seat #S-1560, Maddak, Inc., Pequannock, NJ 07440
Levo Stand-Up Wheelchair, American Stair-Glide Corp., 4001 E. 138th St., Grandview, MO 64030

SENSORY PENS
Mechstat, Inc., 830 N.E. Loop 410, Suite 210, San Antonio, TX 78209
Raised Line Drawing Kit, American Foundation for the Blind, 15 West 16th St., NYC, NY 10011

SOUND-OPERATED AND OTHER REMOTE SWITCHES
Lewis & Conger, 39-25 Skillman Ave., Long Island, NY 1104
Markline, P.O. Box 1750S, Waltham, MA 02154
Vibratile Products, Inc., 83 S. Highland Ave., Ossining, NY 10562

SPEECH COMPRESSOR/RECORDERS
A-7 Speech Controller, Variable Speech Control Corp., 185 Berry St., San Francisco, CA 94107
Lexicon Varispeech II, Lexicon, Inc., 60 Turner St., Waltham, MA 02154
Superscope C-104 Portable Cassette Recorder, Superscope, Inc., 20525 Nordhoff St., Chatsworth, CA 91311

SPEECH SYNTHESIZERS, COMMUNICATORS
Phonic Mirror Handi Voice, HC Electronics, Inc., 250 Camino Alto, Mill Valley, CA 94941
Canon Communicator, Telesensory Systems, Inc., 3408 Hillview Ave., P.O. Box 10099, Palo Alto, CA 94304

TABLES/HEIGHT-ADJUSTABLE
Fleetwood, 25 E. Washington Street, Zeeland, MI 49464
Intimus Designs, 8410 E. Roosevelt, Scottsdale, AZ 85257
Rudd International Corp., 1066 31st St. NW, Washington, D.C. 20001

"TALKING" CALCULATOR
"Speech Plus", Telesensory Systems, Inc., 1889 Page Mill Road, Palo Alto, CA 94304

TELEPHONE AIDS
local Bell System representatives
Fred Sammons, Inc., Box 32, Brookfield, IL 60513
Lewis & Conger, 39-25 Skillman Ave., Long Island, NY 1104
Maddak, Inc., Pequannock, NJ 07440
Markline, P.O. Box 1750S, Waltham, MA 02154

TELEPHONE AIDS FOR NON-VERBAL PERSONS (TTY)
Micon MCM, Micon Industries, 252 Oak St., Oakland, CA 94607
Porta-tel, Specialized Systems, Inc., 215 South Highway 101, Suite 203, Solana Beach, CA 92075

TELEPHONE AIDS FOR NON-VERBAL PERSONS (TTY)
Micon MCM, Micon Industries, 252 Oak St., Oakland, CA 94607
Porta-tel, Specialized Systems, Inc., 215 South Highway 101, Suite 203, Solana Beach, CA 92075

TYPEWRITER KEYGUARDS, PAPER ROLLS
Fred Sammons, Inc., Box 32, Brookfield, IL 60513
IBM Office Products Division, One Gateway Center Plaza, Newton Corner, M. (or local IBM representative)
Olympia USA, Inc., Rt. 22, Somerville, NJ 08876

TYPEWRITERS
IBM Correcting Selectric II, IBM Office Products Division, One Gateway Center Plaza, Newton Corner, MA
Olympia USA, Inc., Rt. 22, Somerville, NJ 08876
Smith-Corona Sterling Electric 12, SCM, Consumer Products Division, 299 Park Ave., NY, NY 10017

VIDEO READING AIDS
Apollo Lasers, Inc., 6357 Arizona Circle, Los Angeles, CA 90045
Visualtek, 1610 26th Street, Santa Monica, CA 90404

WHEELED CARTS, SHOULDER BAGS, CARRYING AIDS
Atlantic Office Supply Co., Inc., 4907 Annapolis Road, Bladensburg, MD 20710
Chesley Industries, Inc., 20775 Chesley Dr., Farmington, MI 48024
FashionAble, Rocky Hill, NJ 08853
G.E. Miller, 484 S. Broadway, Yonkers, NY 10705
Global Equipment Co., 6556 Hemlock Drive, Hempstead, NY 11550
Maddak, Inc., Pequannock, NJ 07440
Environmental modification guidelines illustrated in Designing for Functional Limitations have been compiled from resources on architectural accessibility, human factors, occupational therapy, and rehabilitation medicine, as well as from disabled persons' experiences at the worksite.


The Ohio Governor's Committee on Employment of the Handicapped. Access for All: An Illustrated Handbook of Barrier-Free Design for Ohio, Columbus, Ohio: The Ohio Governor's Committee on Employment of the Handicapped, 1977.


