Telecommunications Accessibility Guidelines for Older Persons and Persons with Disabilities

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Contents

The Telecommunications Accessibility Guidelines for Older Persons and Persons with Disabilities (Second Edition) is designed to enhance accessibility for older persons and persons with disabilities (including disabilities of a temporary nature) to all manner of telecommunications equipment and software, as well as associated telecommunications services. To this end, the Guidelines sets out important basic considerations for telecommunications equipment and services at the planning, development, design, distribution and evaluation stages.

Purpose

These Guidelines on telecommunications equipment and services have been produced independently by the Info-Communications Access Council* (hereinafter referred to as the Council), based on Notification No. 515 dated October 30, 1998, from the then Ministry of Posts and Telecommunications (now the Ministry of Internal Affairs and Communications), entitled Principles of Accessibility of Telecommunications Equipment for Persons with Disabilities. The Guidelines are designed to promote easy access to telecommunications services by older persons and persons with permanent and/or temporary disabilities (hereinafter collectively referred to as persons with disabilities). Through these Guidelines, the Council aims to encourage the incorporation of accessible design principles into the design, development and distribution of telecommunications equipment and services, thereby helping to extend user-friendly telecommunications equipment and services to all users (including older persons and persons with disabilities) and promoting the balanced development of the telecommunications sector in Japan. The first edition of the Guidelines was released in July, 2000; this document represents the revised second edition.

As a result of the spectacular growth in information technology (IT), in particular the rapid proliferation of the internet, we are increasingly coming into contact with telecommunications equipment and services in the course of our work and daily lives.

Japan has a rapidly aging society, which means that older persons and persons with disabilities will likewise be increasingly coming into contact with telecommunications equipment and services. For this reason, it is important to ensure that persons with disabilities or restricted physical or cognitive abilities have equal access to telecommunications equipment and services.

In order to keep pace with these changes in the marketplace and society as a whole, it is to the ultimate benefit of both consumers and suppliers (in these Guidelines, “suppliers” includes retailers and vendors) for telecommunications equipment and services to be accessible to all users. Accessibility is achieved by incorporating universal design principles into the design and development process and striving to develop telecommunications equipment and services that are user-friendly for all. To this end, the Guidelines describe the main issues faced by older persons and persons with disabilities in attempting to use telecommunications equipment and services, and set out general principles and strategies for resolving such issues. The Guidelines also list useful design and development considerations, along with reference information and evaluation techniques.

* Launched as the Telecommunications Access Council on November 19, 1998; name changed to Info-Communications Access Council on July 16, 2003.

Background to the Second Edition

The first edition of the Guidelines, released in July 2000, was designed to help improve accessibility for older persons and persons with disabilities and promote the development of more user-friendly telecommunications equipment and services via the application of the Guidelines in conjunction with greater social opportunity.

The Basic Law on the Formation of an Advanced Information and Telecommunications Network Society (also known as the IT Basic Law), enacted on January 6, 2001, contains provisions for addressing the digital divide associated with age and disability. Similarly, the e-Japan Priority Policy Program, a package of initiatives designed to achieve the basic objectives of the IT Basic Law, includes specific strategies for reducing the digital divide.

The Basic Program for Persons with Disabilities, revised in December 2002, sets out a basic framework for disabled policies designed to promote the development and use of information and communication devices suitable for disabled persons, including greater procurement of such devices by government organizations.

On the international front, ISO/IEC Guide 71 (Guidelines for standards developers to address the needs of older persons and persons with disabilities), presented by Japan to ISO/COPOLCO (the Committee on Consumer Policy of the International Organization for Standardization) and released in November 2001, provides guidelines for use in the preparation of standards for use in the development of products and services suitable for older persons and persons with disabilities, and analyses associated issues. In the United States, federal government procurement regulations based on Section 508 of the Rehabilitation Act were enacted on June 25, 2001.

In Japan, the work of the Info-Communication Access Council is complemented by the Standardization Study Group for Barrier-Free Information Access, established in September 2000 by the Information Technology Research and Standardization Centre (INSTAC), the standardization organization responsible for JIS (Japanese Industrial Standards), and Accessibility Standards Committee, set up by the Japan Electronics and Information Technology Industries Association (JEITA) in April 2001. Both these bodies are working on the development of accessibility guidelines for information-related industries in conjunction with related groups and organizations.

Three new standards are estabilised: JIS X8341-1:2004 (Guidelines for older persons and persons with disabilities - information and communications equipment, software and services — Part 1: Common Guidelines), JIS X8341-2:2004 (Guidelines for older persons and persons with disabilities - information and communications equipment, software and services — Part 2: Information Processing Equipment), and JIS X8341-3:2004 (Guidelines for older persons and persons with disabilities - information and communications equipment, software and services — Part 3: Web Content).

The aim of the second edition of the Telecommunications Accessibility Guidelines for Older Persons and Persons with Disabilities is to present in clearer and more precise detail the relevant considerations in telecommunications design and development processes, based on the principles enunciated in JIS Z8071:2003 (Guidelines for standards developers to address the needs of older persons and persons with disabilities) and in close alignment with JIS X8341-1:2004 (Guidelines for

older persons and persons with disabilities - information and communications equipment, software and services — Part 1: Common Guidelines).

1 Scope

These Guidelines set out relevant considerations in the planning, development, design and distribution processes designed to enhance accessibility to all forms of telecommunications equipment and software and associated telecommunications services (hereinafter referred to collectively as "telecommunications equipment and services") for older persons and persons with disabilities, both temporary and permanent.

2 Normative references

1. JIS Z8071:2003, Guidelines for standards developers to address the needs of older persons and persons with disabilities
2. JIS X8341-1:2004, Guidelines for older persons and persons with disabilities - information and communications equipment, software and services — Part 1: Common Guidelines
3. JIS X8341-2:2004, Guidelines for older persons and persons with disabilities - information and communications equipment, software and services — Part 2: Information Processing Equipment
4. JIS S0011:2000, Guidelines for all people including older persons and persons with disabilities — Marking tactile dots on consumer products
5. JIS S0012:2000, Guidelines for all people including older persons and persons with disabilities — Usability of consumer products
6. JIS S0013:2002, Guidelines for all people including older persons and persons with disabilities — Auditory signals on consumer products
7. JIS S0014:2003, Guidelines for all people including older persons and persons with disabilities — Auditory signals on consumer products — signal levels tailored to interference noise and changes in hearing with age
8. JIS S0032:2003, Guidelines for all people including older persons and persons with disabilities — Visual markings — method to determine minimum readable text size for Japanese text
9. JIS Z8530:2000, Human-centered design processes for interactive systems
10. JIS Z8513:1994, Ergonomic requirements for office work with visual display terminals — Requirements of visual display terminals
11. JIS Z8518: 1998, Ergonomic requirements for office work with visual display terminals – Requirements for displayed colors
12. JIS C5512:2000, Hearing aids
13. JIS Z8524:1999, Ergonomic requirements for office work with visual display terminals – Menu dialogues
14. JBMS-71: 2004, Office equipment — Auditory signals

3 Definitions

Telecommunications equipment

Any machine, device, line or other form of telecommunications equipment used to perform telecommunications operations.

Telecommunications services

Services provided to users via the use of telecommunications equipment.

Mediated interactive telecommunications services

Services designed to enable the two-way exchange of information between multiple users in multiple locations via telecommunications equipment such as an exchange or network server. Examples include voice telephony, facsimile, video phone, e-mail and instant messaging services.

Telecommunications platform services

Services designed to support telecommunications equipment and user management, user authentication, content management, charging and payment procedures by operators engaged in the provision of information services via telecommunications equipment ("information service providers"). Examples include content distribution to mobile telephones and fee collection agencies (dial Q2).

Telecommunications accessibility

Designing telecommunications equipment and services to be readily usable by older persons and persons with disabilities.

Assistive technology for older persons and persons with disabilities

Technology designed to improve the functional capabilities of older persons and persons with disabilities in operating and utilizing telecommunications equipment and services.

4 General principles

4.1 Basic policies

This section outlines the basic accessibility policies applicable to all forms of telecommunications equipment and services.

a) Every effort is being made in the planning, development, design and distribution processes to ensure that older persons and persons with disabilities will be able to operate and utilize telecommunications equipment and services.

b) Where the required degree of accessibility cannot be provided in the standard configuration of a product, it is possible to attain such accessibility by using the product in combination with optional extras or assistive technology from other manufacturers.

c) Functions and features designed to provide telecommunications accessibility are safe for users.

4.2 Basic requirements

This section outlines the basic requirements for telecommunications equipment and services in order to provide telecommunications accessibility.

a) Product can be operated/used by persons experiencing visual difficulty with information input.

b) Product can be operated/used by persons experiencing auditory difficulty with information input.

c) Product can be operated/used by persons with speech difficulties.

d) Product can be operated/used irrespective of strength/dexterity.

e) Product can be operated/used by persons with no use of lower limbs.

f) Product can be operated/used from a wheelchair.

g) Product can be operated/used with either hand.

h) Product can be operated/used with limited movement by a hand, foot, finger or artificial limb.

i) Product can be operated/used by persons with limited sensory perception.

j) Product protects the user from contact with materials containing toxins and/or allergy-aggravating substances.

k) Product can be operated/used without excessive strain on cognitive or memory skills.

l) Product operation/use is not hindered by cultural and/or language differences.

m) Product can be operated/used by persons who have never used such a product before.

Note

It is not expected that every product and service will satisfy every one of the above requirements. However, as far as practicable, products and services should be designed to provide accessibility to persons with multiple disabilities (see also Section 4.1, Basic Guidelines, paragraph (b), and Section 4.3.11, Multiple disabilities).

4.3 Characteristics and limitations of older persons and persons with disabilities

This section describes the physical and mental capabilities of older persons, persons with disabilities and other users, as well as disabilities and characteristics associated with the aging process and issues related to the use of telecommunications equipment and services.

4.3.1 Vision

Characteristics

Visual impairment refers to a decline in visual acuity, including complete loss of sight. Visual impairment can take a variety of forms, including total loss of vision, seeing difficulties that cannot be remedied by corrective eyewear (or only marginally), a condition where normal lighting appears excessively bright, inability to distinguish between colors, constricted field of vision, and obstruction of the field of view by floating shapes. Another potential vision issue is trembling due to physical disability, which can prevent a person with normal vision from concentrating on the display area of a product.

Effects of aging

As a person ages, the near point distance (the closest distance at which the eyes can focus) gets steadily further away and near eyesight becomes steadily weaker. The eye lenses tend to become cloudy and yellowed, affecting color discrimination and the ability to distinguish between approximate brightness differences and chroma. Cloudy lenses also disperse the light, with the result that bright regions on the periphery of the field of view tend to create an unpleasant sensation of glare. In addition, the eye's ability to adapt to changes in brightness diminishes, while vision in poor lighting conditions is reduced.

4.3.2 Hearing

Characteristics

Hearing impairment refers to any form of hearing difficulty, ranging from a mild reduction in hearing to virtual deafness. Hearing impaired persons generally have difficulty hearing sounds that are both too loud and too soft. A person's ability to hear a sound is influenced by the frequency and volume of the sound. Ringing in the ears also affects hearing ability. For persons afflicted by more profound disabilities, such as impairment of the inner ear, hearing aids have only a limited effect on the ability to distinguish voices. Most people who have had hearing impairment since birth or early childhood use sign language as their primary means of communication. Since Japanese is their second language, they may encounter difficulty comprehending complex sentences.

Effects of aging

The onset of hearing loss generally begins with high frequencies; by age 50 or so, a decline in hearing acuity is already starting to appear in the 3 kHz and above range. Hearing errors are more common with hard consonants, which contain more high-frequency components and are therefore harder to distinguish. It also becomes harder to pick out voices against background noise, and to understand strained or distorted voices. Thus, the range of readily distinguishable sounds is steadily reduced.

4.3.3 Touch

Characteristics

Tactile impairment refers to diminished tactile sensation, ranging from minor symptoms through to a complete loss of tactile sensation (typically associated with encephalopathy). Common problems include: difficulties identifying small protrusions on a surface or distinguishing between materials by touch; inability to sense temperature, leading to burns and scalds; and inability to feel pain in the event of injury. Artificial limbs and similar aids are unsuitable for manual procedures predicated on the use of tactile perception.

Effects of aging

Tactile sensation declines with age, particularly in the fingertips. This makes it more difficult to register very precise sensory experiences such as the texture of a surface or the click of a button. Burns and injuries commonly occur because older persons have less ability to detect and react to sensations such as heat and pain.

4.3.4 Hand movement

Characteristics

Typical problems associated with physical handicaps include: inability to move the arm into the required position; unstable movement; and limited movement in the fingers, making device operation difficult or impossible. Persons with paraplegia generally have no problems with hand and finger movement, while persons with hemiplegia often have restricted movement in one hand only. Afflictions such as cerebral palsy are often manifested as athetosis or involuntary movement, making complex movements extremely difficult to execute. Thus, the problems generally involve an

inability to complete rapid operations due to slow response speeds and difficulty executing complex operations.

Effects of aging

The ability to perform precise finger movements declines with age, as do response times and movement speed, particularly with regards to adjustment of dials and levers. A reduced mobility range in joints limits the position and scope of physical device operation, while other afflictions can restrict the movement of the hands and paralysis can render one hand unusable.

4.3.5 Strength

Characteristics

Muscular dystrophy sufferers are usually capable of complex hand and finger motions, but only within a limited range of movement and with very little strength. A more severe condition is amyotrophic lateral sclerosis (ALS), where the muscles are virtually unusable. Reduced muscle strength due to illnesses such as these makes operations such as pressing buttons or using moving sliders all but impossible.

Effects of aging

As a result of declining muscle strength and/or general body strength, older persons may not have the power to complete operations and may experience pain. Persons with reduced muscle strength may also have difficulty holding heavy objects for long or maintaining ongoing operations over a sustained period. The muscles responsible for hand grip and back strength peak at around age 20 and decline thereafter; by the late 60s, they have reverted to the level of the early teen years.

4.3.6 Lower limb movement, muscle strength and wheelchair use

Characteristics

Persons with lower limb disabilities often require walking aids (such as railings, canes, walking frames and wheelchairs, both ordinary and motorized); some are completely unable to walk. A person who uses a cane or other walking aid may have only one hand free to operate a telecommunications device when standing, or may have difficulty remaining upright and require a handrail for support. Wheelchair-bound persons, meanwhile, may find the height or dimensions of the wheelchair make it difficult to read a display or operate the keys or buttons of a telecommunications device, depending on how it has been installed.

Effects of aging

Muscle deterioration due to aging gives rise to the same sorts of difficulties as those described above.

4.3.7 Intellect and memory

Characteristics

Intellect is the capacity to consolidate, order and process information. Intellectual disability refers to impairment of intellect and memory functions. Persons with intellectual disabilities may have difficulty understanding the meaning of words, or may forget things so quickly that they are unable

to follow procedures involving several steps. They may also have difficulty understanding instruction manuals.

Effects of aging

Fluid intelligence — the ability to understand and process information — peaks at around age 20 and declines steadily thereafter, while crystallized intelligence, which is acquired through vocabulary, concepts, knowledge and other learning experiences, continues to increase beyond 50 years of age and does not seem to deteriorate in old age. Although long-term memory changes little with age, minor memory problems such as being unable to recall specific events or nouns are more common. Short-term memory, meanwhile, peaks in the mid-30s, which means that new experiences become increasingly difficult to recall with age. Another problem commonly associated with age is a declining ability to perform operations requiring sustained concentration, and inability to recall an operation previously performed.

4.3.8 Speech

Characteristics

Speech impairment ranges from difficulty speaking smoothly to a complete inability to form words. There are three main causes of speech impairment. Motor dysarthria is the result of malformed speech organs that not respond properly to commands from the brain, while brain damage can cause language difficulties. Persons with hearing impairment from birth or early childhood may have difficulty internalizing spoken words; this often affects speech clarity and other speech parameters. Also, persons who have difficulty determining their own voice level may speak unnecessarily loudly.

Effects of aging

Deterioration of the vocal cords with age can cause speech impairment and make it more difficult to express oneself

4.3.9 Physique

Characteristics

Physique refers to the qualitative characteristics of the human body as a whole, meaning the overall characteristics of the dimensions of the body's various components. The operation panel of a device must be installed at an appropriate position and height to allow for sustained use over a long period and to prevent difficulties with operation.

Effects of aging

Aging can restrict the mobility range of joints and cause changes in body posture, thereby limiting the range of positions and heights at which device operation is possible.

4.3.10 Allergies

Characteristics

Allergies are associated with contact, the respiratory tract, and foodstuffs.

4.3.11 Multiple disabilities

Characteristics

Multiple disabilities refers to a combination of two or more disabilities such as visual and hearing impairment together, or hearing impairment together with restricted movement of the hands. A person with multiple disabilities generally experiences more difficulties or problems than a person with a single disability.

Effects of aging

The aging process causes the deterioration of all bodily functions, including sight, hearing, touch, hand movement, muscle strength and recognition. However, the extent of deterioration varies considerably for different persons, as does the extent of deterioration of each different function. The combination of even minor deterioration in several areas at once (for instance, sight, hearing and muscle strength) can prevent the use of alternative means or media to access devices, and therefore the normal operation and use thereof.

4.3.12 Cultural and language differences and inexperience

Characteristics

Although cultural and language differences and lack of experience do not constitute disabilities as such, the resulting problems and difficulties are similar to those caused by disabilities and aging. A person from a different cultural background may harbor a different set of implicit understandings and customs and may have difficulty working out how to use a device. Similarly, a person with no experience and no base knowledge of the product may have difficulty in making sense of the required operations or grasping the meaning of text and icons. Persons with limited understanding of the Japanese language will have difficulty reading Japanese text, particularly kanji characters.

5 Common principles

General

The common principles set out in this Chapter are applicable to the planning, development and design of all forms of telecommunications equipment and services. Chapter 6 describes more specific considerations applicable to terminal equipment, while Chapter 7 describes considerations applicable to services.

5.1 Operation

5.1.1 Load minimization for sensory, physical and cognitive functions

The aim is to minimize the burden of device operation on sensory functions such as vision, hearing and touch, physical capacity such as muscle strength, and cognitive functions such as understanding and comprehension.

Example 1

Visually impaired persons may have difficulty reading very small text, or experience strain when attempting to follow very large text, or be unable to distinguish between colors. Consideration is

given to text size and color.

Example 2

Hearing impaired persons may experience strain from the concentration needed to pick up low-volume sounds and sounds consisting of hard-to-hear frequencies. Consideration is given to sound volume and frequency.

Example 3

Hearing aids may be affected by electromagnetic noise generated by devices, resulting in background noise or loss of volume control capability which can cause hearing difficulties for the wearer. Consideration is given to users of hearing aids and other types of assistive technology.

Example 4

Persons with reduced muscle strength may have difficulty in situations requiring a button to be depressed with force. Consideration is given to muscle strength.

Example 5

Persons who have use of only one hand have difficulty with operations requiring the use of both hands, and are obliged to resort to extreme measures such as using the face or elbow. Consideration is given to single-handed operation.

Example 6

Persons with reduced tactile perception, as well as wearers of artificial limbs, may have difficulty registering the click of a button or the transition between different surfaces. For this reason, device operation is not dependent solely on tactile perception.

Example 7

Multi-level menus and operations that require reading or listening to a large amount of information can tax cognitive functions excessively. For this reason, operations are designed to be as simple as possible.

5.1.2 Consistency of operation procedures

Operation procedures are designed to be consistent so that a complete operation or acquisition of information can be performed using only one type of physical function.

a) Ensure that acquisition, comprehension and manipulation of information can be achieved via a consistent flow of operations using a single physical function.

Example 1

Design consistent input procedures that can be completed by a person who has use of one hand only.

Example 2

Provide an interactive voice system that can be operated/used with voice only.

b) Ensure that the design of menu-driven systems is based on consistent operation.

Refer to:

JIS Z8524:1999, Ergonomic requirements for office work with visual display terminals — Menu dialogues

5.1.3 Error prevention

The aim is to prevent limitations of sensory functions such as sight, hearing or touch, physical functions such as muscle strength, cognitive functions such as language comprehension, or body features such as finger shape from causing erroneous operation by the user.

Example 1

Where a device employs a variety of different types of keys, the layout, color scheme, contrast, key shapes and key labels are designed to be readily recognizable.

Example 2

Expressions that require a response from the user are framed in clear and simple language, and either displayed in large type (in the case of text) or spoken clearly at a sufficient volume (in the case of voice commands).

Example 3

The device is equipped with functionality for modifying parameters such as text size, color, contrast, voice guidance, and the speed and volume of auditory signals, either from the device itself or using assistive technology.

Example 4

The device is designed to assist visually impaired users in recognizing the key at the base position, for instance by providing a tactile dot on the key (for tactile recognition) or by having the key name or function read out when the key is pressed (auditory recognition).

Example 5

The device is designed to facilitate correct replenishment or replacement of expendables such as paper and ink ribbon and is compatible with peripheral equipment and devices. Where the orientation of the product is important, insertion is only possible in the correct direction.

Example 6

Emergency notification functions, where fitted, require a press and hold operation or equivalent in order to prevent the possibility of erroneous operation.

5.1.4 Error cancellation

Where possible, erroneous operations can be cancelled to restore the previous setting or status.

Example 1

Provide a feature for canceling a succession of operations and restoring the previous status.

Example 2

Prompt for user confirmation before canceling an operation.

Example 3

Provide a feature for returning to the main menu in the event of accidental selection of an incorrect menu item.

5.1.5 Revert to initial status

Reverting to the initial status during a procedure can be achieved via a simple operation.

Example

It is possible to return immediately to the main menu in the event that the user becomes confused during a menu operation.

5.1.6 Confirmation

The following can be confirmed via multiple senses (vision, hearing and touch):

• Whether the device is in ready mode

• Whether the line is in a usable state

• Whether the device is about to become unusable and why

• Whether an input operation was intended

• The outcome of an operation

Example 1

Provide an auditory power on signal (in addition to the display readout) when the device is ready for operation.

Example 2

Provide audio as well as visual notification of the battery running out.

Example 3

In the event of an attempt to enter text in a numeral-only input field, provide auditory signal together with another form of error warning for the benefit of hearing impaired persons.

Example 4

Warning messages on the screen are accompanied by another form of sensory stimulation, such as auditory signal or vibration, for the benefit of vision impaired persons.

Example 5

Provide vibration or other forms of notification in addition to auditory signal to indicate whether the device is enabled for conversation.

Notes

1. Normally the device is not ready for operation when the power is not switched on or when another operation is in progress.

2. Section 5.1.8 below describes requirements in the event of irrecoverable error.

5.1.7 Start and finish operations

The user must be given control over the means of starting and finishing use of the device and/or service.

Note

Some users are unable to complete the physical operations required to start and finish using the device without assistance.

Example

Consideration is given to the position, size, shape and mode of use of the power button.

5.1.8 Error reset

The device must allow the user to perform a force quit or restart in the event of an irrecoverable

error.

Note

In the event of an irrecoverable error, the user can perform a force quit or restart via a simple operation that does not have any adverse impact on the device, as a result of which the device will revert to its operating status prior to the error.

5.2 Language and terminology

5.2.1 General usage

Instructions and messages are written in plain language, free of industry-specific words, foreign words and abbreviations.

Notes

1. Where industry-specific words, foreign words and/or abbreviations are employed, a glossary or equivalent is provided to assist readers in understanding the information.

2. Instructions and messages for devices are expressed in simple, clear and concise language to ensure that users can get the most out of the product.

5.3 Safety

5.3.1 General

Devices must be designed to accommodate accidental movement by the user without causing an operation which could threaten the user's health or safety. Where appropriate, products and systems are equipped with auto shutdown features, and/or warning messages designed to prevent confusion or consternation.

Example 1

Avoid excessive earpiece volume that could harm the user's hearing.

Example 2

Auditory signal or voice guidance output is accompanied by on-screen information such as a flashing icon or error message providing more detail of the error status.

Example 3

Provide a vibrating alert or other sensory means of attracting the attention of users with both visual and hearing impairment.

Example 4

Provide several different modes of warning in the event of an erroneous operation by the user which could be potentially dangerous.

Notes

1. Where a visual difficulty means the user has to operate the product by feel, the user is able to avoid dangers during operation by adhering to operating instructions and warnings that have been provided beforehand in a form acceptable to the user.

2. These features can also be used to assist users with intellectual disabilities.

5.3.2 Photosensitive epilepsy

Any flashing of lights or screen elements must be carefully designed to avoid potential problems such as photosensitive epilepsy.

Note

Flashing lights are known to cause photosensitive seizures (otherwise known as photosensitive epilepsy). The effect is particularly pronounced with alternating red and blue light, peaking at 20 Hz. Photosensitive epilepsy is an extremely important safety matter and consideration of this problem must be incorporated into product design.

5.3.3 Electromagnetic noise

EMI (electromagnetic interference) generated by telecommunications equipment, such as radio waves and electromagnetic noise, should not present any danger to users of the equipment.

Notes

1. Radio waves emitted by mobile telephones can produce noise in hearing aids.

2. Radio waves emitted by mobile telephones can interfere with the operation of pacemakers and defibrillators. A separation distance of least 22 cm is required for safety reasons.

3. Guidelines for preventing interference with medical equipment by mobile telephones and other mobile devices were released on March 27, 1997 by the Electromagnetic Compatibility Conference Japan.

5.4 Security

5.4.1 Privacy protection

Secure yet accessible operation procedures are provided for the protection of information of a private or confidential nature.

Note

Without proper information security design, use of voice synthesis features could allow third parties to steal passwords and personal details.

5.4.2 Alternative method for identifying user

Where biometrics technology is used to identify the user or permit user operations, the device also offers the option of an alternative means of identification that is not dependent on the physical characteristics of the user.

Note

Authentication methods such as fingerprints, iris scanning or face recognition are complemented by alternative identification methods such as a PIN number.

Example

Consideration is given to users who are unable to use fingerprint authentication systems.

5.5 Content protection

5.5.1 Usage rights

Where data is protected for copyright or other reasons, users recognized as having the right to the data are provided with a means of accessing the data.

Notes

1. Under current copyright law, Braille computer files of copyright works already made public may be generated for the purpose of issuing Braille translations and distributed to the public.

Article 37, amended in 2000, states:

It shall be permissible to reproduce in Braille a work already made public. It shall be permissible to record on a memory, or to make the public transmission of, a work already made public, by means of a Braille processing system using a computer

2. The Agency for Cultural Affairs has approved the application of a "Disabled OK" logo which is affixed to copyright works where the owner of the copyright consents to the use of the copyright in this manner. The logo can be downloaded at no charge from the Agency for Cultural Affairs website.

Example

Devices are equipped with content which can be converted into auditory instructions using voice synthesis software (or equivalent alternative), so that persons with visual impairment can listen to spoken readouts of on-screen text.

5.6 Environmental considerations

5.6.1 Impact on immediate surroundings

The device allows user adjustment of the level and nature of outputs such as sound, vibration and screen flashing with potential impact on the immediate surroundings, including persons with disabilities.

Note

Hearing impaired persons may have difficulty hearing a device that generates a sound loud enough to cause disturbance to others in the vicinity. Similarly, a flashing screen could cause a distraction to others while going unnoticed by a vision-impaired person. Even vibration needs to be confined to a level that does not cause disturbance. All such features and functions therefore need to be adjustable in order to minimize the impact on the immediate surroundings.

5.7 Maintenance and upkeep

The user will not encounter any difficulty in performing the maintenance and upkeep tasks necessary to enable continued usage of the device.

Example

Maintenance and upkeep tasks, such as recharging and replacing the battery, adding paper and replacing ink ribbons, will not present any difficulty to the user.

6 Requirements for terminal equipment

6.1 General requirements

This section sets out common requirements applicable to all types of terminal equipment.

6.1.1 Layout of operation panel

a) Design the display and key layout on the basis of user thought processes and operational procedures.

b) Avoid excessive line length on the display and overly detailed information.

c) Avoid crowded display and key layout configurations.

d) Align the direction of operation of switches with the direction of movement of the device itself.

e) Arrange operation keys in functional groups by shape, position, color or other attribute that can be readily identified by persons with visual or tactile sensory impairment.

Reference

JIS Z8071:2003 (Guidelines for standards developers to address the needs of older persons and persons with disabilities)

6.1.2 Operation procedures

a) Information is provided in clear and simple language and in a logical procedure consistent with user thought processes.

b) Operational procedures are logical and consistent with user thought processes.

c) Slow input is permitted.

Example 1

The period for which information is displayed and the time allowed for confirmation of input data is adjustable; the latter can be set to infinity if desired.

Example 2

A newly entered telephone number can be used to make a call once confirmed.

d) When the input mode time limit expires, both visual and auditory confirmation of automatic mode switching is possible.

Example

The automatic mode switching alert tone (low-level alert tone) is a cycle of five 0.5 second (0.2 second) tones.

Note

The figure in brackets is the silence between tones. Thus, five 0.5 second (0.2 second) tones means five tones lasting 0.5 seconds each, with 0.2 seconds of silence between each.

Reference

JIS S0013:2002, Guidelines for all people including older persons and persons with disabilities — Auditory signals on consumer products

JBMS-71: 2004, Office equipment — Auditory signals

6.1.3 Operation keys and buttons

a) Operation keys are designed for both visual and tactile recognition.

b) Operation keys provide a tactile response when depressed.

c) Both visual and auditory confirmation of key input are provided.

Example 1

Input results can be confirmed visually (usually from the display).

Example 2

The input confirmation alert tone duration is 0.1 second.

Example 3

The invalid input alert tone duration is 0.1 second (0.1 second) 0.5 second.

Reference

JIS S0013:2002, Guidelines for all people including older persons and persons with disabilities — Auditory signals on consumer products

JBMS-71: 2004, Office equipment — Auditory signals

Example 4

Numeric entry can be confirmed by voice read-out.

d) The placement, size and shape of keys and buttons are designed to prevent accidental pressing of adjacent keys.

e) The device is equipped with a double input suppression feature.

Example

Key input suppression can be set at up to two seconds to prevent double input.

f) The key repeat delay is fully adjustable.

Reference

Key repeat is a function which treats a press and hold operation as continued pressing of a key.

Example

Key repeat interval can be adjusted, and the key repeat function can be switched off entirely.

g) The device is easy to operate overall.

Example

The device is equipped with a speed dial feature that can be used to dial a preset number with a single key operation.

h) Toggle menus provide both visual and auditory confirmation of the origin or start point.

Example

The duration of the alert tone indicates the origin is 0.05 second (0.05 second) 0.05 second.

Reference

JIS S0013:2002, Guidelines for all people including older persons and persons with disabilities — Auditory signals on consumer products

JBMS-71: 2004, Office equipment — Auditory signals

i) The main keys and buttons used to perform basic operations can be manipulated using an aid such as an artificial limb or mouse stick as well as the hand and fingers; if this cannot be incorporated into the design of the keys and buttons, an alternative means of operation is provided.

Example 1

Voice recognition dialing.

Example 2

Recognizes the other party and responds automatically.

Example 3

Concave buttons are easier to operate with assistive deyices.

Note

Electrostatic keys and buttons and touch panels can be difficult to operate using assistive deyices and artificial limbs.

j) Touch panel software keys and buttons can be operated without direct visual confirmation; if not, a suitable alternative is provided.

Note

Persons with impairment may have difficulty locating keys and buttons on a touch panel.

Example 1

Keys and buttons are displayed in a larger size than normal.

Example 2

Tactile guides are provided for identifying keys and buttons.

6.1.4 LCDs and other displays

a) Text is easy to read.

Example

Text can be enlarged.

b) Display content is not color-dependent.

Reference

JIS Z8513:1994, Ergonomic requirements for office work with visual display terminals — Requirements of visual display terminals

c) Surface reflection does not create any difficulty in seeing the screen.

Reference

JIS Z8513:1994, Ergonomic requirements for office work with visual display terminals — Requirements of visual display terminals

d) Adjustable brightness and contrast.

Reference

JIS Z8513:1994, Ergonomic requirements for office work with visual display terminals — Requirements of visual display terminals

e) Information remains on screen for some time.

f) Easy to see in low light conditions.

Example

Backlight feature provided.

6.1.5 Printed information

a) Text and symbols are easy to read at normal viewing distance under normal light conditions.

b) Size, form and contrast of text and symbols are designed to be easy to read.

c) Information content is independent of color.

Reference

JIS Z8518: 1998, Ergonomic requirements for office work with visual display terminals – Requirements for displayed colors

d) The display is close to the relevant keys and buttons.

6.1.6 Terminology, icons and graphic symbols

The following apply to the terminology, icons and graphic symbols employed in display devices such as LCDs and in printed information.

a) Terminology, icons and graphic symbols are clear and can be readily understood without the need of special knowledge.

Example 1

Information is presented in a consistent manner, free of industry-specific terms, foreign words and abbreviations.

Example 2

Icons and graphic symbols are accompanied by explanatory text where possible.

6.1.7 Alert tones

a) The volume and frequency of alert tones are designed to make the tone easy to hear even against a noisy background.

Reference

JIS S0014:2003, Guidelines for all people including older persons and persons with disabilities — Auditory signals on consumer products — signal levels tailored to interference noise and changes in hearing with age

b) The tone volume is adjustable.

c) A mute feature is provided.

Note

The mute function applies to all alert tones including a battery running out alert, so that hearing impaired users can avoid creating a disturbance.

6.1.8 Voice guidance system

a) The voice guidance system is designed to operate at a suitable volume and sound quality.

b) The synthesized voice speaks slowly with suitable pauses.

c) The volume and speaking rate are adjustable.

d) The voice enunciates clearly.

e) The voice guidance system uses normal, everyday language and employs logical procedures based on user thought processes.

f) Individual portions of information are not excessively lengthy.

g) Information provided by the voice guidance is also available in visual form for confirmation.

h) Information can be repeated if necessary.

i) A mute function is provided.

6.1.9 Exterior shape

The exterior shape is designed so as to not cause injury when handled by a user who is not looking at the device.

Example

No sharp angles or edges, either on the exterior shell or interior parts, in locations where the user might touch the device.

6.1.10 Materials

The use of allergy-inducing materials is to be avoided.

Example

Some forms of nickel, chrome and rubber have been found to cause allergic reactions.

6.1.11 Packaging

a) The package in which the product is housed is of a suitable size and shape, made of suitable material and easy to open.

b) The product is easy to remove from the packaging and/or bag.

c) Packaging and tape used for transportation purposes is easy to identify and easy to remove.

Example

The packaging tape is made of a color that stands out.

6.1.12 Installation and settings

a) The product assembly and fitting procedures are simple, clear and logical.

b) The product is designed to be easy to install, without complex wiring or other requirements.

c) The product is designed to resist movement and remain in position even if accidentally bumped.

Example

The product is provided with brackets, screw holes or equivalent to prevent movement.

d) The power cord and cables are easy to connect yet remain secure once connected.

e) The procedures for fitting accessories such as trays and batteries are both easy to understand and simple to perform. The product design inherently prevents incorrect fitting of accessories.

f) Phone line settings are detected automatically.

Example

The device automatically selects either rotary dial or push-button line configuration without any need for user input.

g) Information such as time, station name and telephone number is registered using a simple procedure.

6.1.13 Alternatives

Where specific features of the product pose difficulty for the user, these are supplemented by alternative means of operation involving different parts of the body.

a) The product is compatible with assistive technology for older persons and persons with disabilities where appropriate.

Example 1

Telephone products are provided with a sound output terminal suitable for hearing aids, or with a receiver compatible with induction coil hearing aids. Telephone products do not generate electromagnetic noise that could interfere with hearing aids.

Background noise can be a problem when using a telephone in conjunction with a hearing aid. To this end, telephones are provided with an optional connection feature for transmitting only the direct voice signal.

Example 2

Persons with multiple disabilities, such as blindness and deafness together, cannot use ordinary telephone devices. For this reason, telephone products are designed to enable operation in conjunction with appropriate assistive technology for older persons and persons with disabilities.

b) Where necessary, it is possible to confirm the on-off status of a switchable alternative method by multiple input and output operation methods.

c) Products that employ a touch screen or other input device which responds to subtle contact such as finger touch are also provided with simple alternatives involving tactile sensation or single-handed reduced capacity as well as input repeat functionality and adjustable input interval delay time.

6.1.14 Interface specifications

This section sets out requirements pertaining to standardization and publication of interface specifications.

a) Specifications of the input-output interface for external connection to the device are made available in the public domain.

Note

Details of the interfaces used to connect hardware for external operation or for accessing and overwriting internal information, such as physical interface specifications and protocol information, are made available in the public domain to enable development of compatible forms of assistive technology for older persons and persons with disabilities.

b) The input-output interface for external connection is based on interface specifications used extensively among manufacturers, except where the aim is to promote the use of interface specifications for the connection of external input-output devices.

Notes

1. By employing interface specifications commonly used by manufacturers as the basis for interfaces of input-output devices used for connectivity with assistive technology designed to provide older persons and persons with disabilities with alternative means of external operation, it will be possible to achieve design compatibility with similar systems, thus providing consumers with

a greater degree of choice.

2. Where possible, wireless connectivity is preferable to cables; however, due consideration should be given to the potential effect on devices such as pacemakers.

6.1.15 Design of peripheral device connection slots

The following requirements apply in the case of peripheral devices that are connected and removed frequently.

Example 1

Connection terminals that are frequently used are designed (with respect to position and form) to enable easy insertion and prevent erroneous connection.

Example 2

Electronic media insertion slots are designed with position and orientation to ensure that media can be inserted and removed in the correct orientation.

Example 3

The location, color, contrast and shape of connectors are designed to facilitate connection.

Note

Removal and insertion of electronic media and peripheral device connections may prove difficult for persons afflicted by poor muscle strength, paralysis, shaking of the hands, involuntary movement, or reduced muscle strength due to age. Similarly, a person with reduced visual acuity due to visual impairment or simply age may find it difficult to identify the position or orientation of external devices.

6.2 Basic operational requirements specific to each terminal device

6.2.1 Basic operational requirements for fixed-line telephones

6.2.1.1 Basic features and functions

The basic functions of fixed-line telephones (including desktop, wall-mounted, cordless and IP telephones) are the call (send), calling (waiting for answer), talk and end functions for outgoing calls, and the call received, answer, talk and end functions for incoming calls. The associated requirements are described below. Appendix 1, Disability design considerations for basic fixed-line telephone operations, describes the basic operations in detail and explains the relevant considerations for different forms of disability.

Note

For cordless telephones that are similar in shape to mobile telephones, see also the provisions of Section 6.2.3 below on considerations for mobile telephones.

6.2.1.2 General requirements

General requirements pertaining to layout of the operating panel, operating procedures, terminology, overall shape and materials are as per Section 6.1 above on common requirements for

terminal equipment.

6.2.1.3 Buttons and numeric keypad

a) General requirements pertaining to the buttons and numeric keypad are as per Section 6.1.3 above.

b) The numeric keypad is readily distinguishable from other keys and buttons for the benefit of persons with visual or tactile sensory impairment.

Example

A tactile dot of diameter 1.5 – 2.0 mm and height 0.5 – 0.8 mm is provided in the centre of the number 5 key.

Reference

JIS S0011:2000, Guidelines for all people including older persons and persons with disabilities — Marking tactile dots on consumer products

c) The size, contrast and shape of numbers printed on keys are designed to make them easily visible.

Example

Use a gothic font with character height of at least 3.0 mm and brightness difference of at least 4.0.

Reference

JIS S0012:2000, Guidelines for all people including older persons and persons with disabilities — Usability of consumer products

d) Keys provide a tactile response when depressed.

Example

Except for tactile switches, keys produce a click response with a finger pressure of around 100 g and stroke of around 0.8 – 1.2 mm.

6.2.1.4 Receivers

a) The receiver is easy to hold, non-slippery and evenly weighted.

b) The correct orientation and position of the receiver is intuitively obvious.

c) The receiver is usable when not actually being held in the hand.

Example

Speaker-phone functionality.

Note

A phone with voice recognition functionality for performing operations such as call send and call receive in speaker-phone mode without the need for key operations would allow persons with upper torso disabilities to make use of fixed-line telephones, and would also make telephones more accessible to persons with limited mobility, such as those confined to wheelchairs.

6.2.1.5 LCDs and other displays

Refer to Section 6.1.4 above regarding LCDs and other displays.

6.2.1.6 Printed information

Refer to Section 6.1.5 above regarding printed information.

6.2.1.7 Receiver sound

a) Telephones are equipped with adjustable volume.

b) Telephones that allow the user to set the volume to louder than normal levels are equipped with an automatic reset function.

c) The volume level is easily adjustable during use.

d) The telephone is equipped with a simple means of confirming the current volume level.

Note

Numerical standards for sound amplification applicable to fixed-line telephones are given below.

- CES-Q003-1 (Communications and Information Network Association of Japan)
  Telephone spoken sound quality standards — IP telephone terminals (handsets)
  The receiver volume adjustment function must be capable of amplifying the volume by at least 8 dB above the standard sound level.
- FCC specifications: Title 47 of the Code of Federal Regulations (CFR), section 68.137 (a)
  Telephones must by law provide fully adjustable Receive Objective Loudness Rating (ROLR) amplification of at least 12 dB and no more than 18 dB over the normal unamplified sound level.
- Section 508, Part 1194, Article 23, Communications Products
  Products must be equipped with adjustable amplification capability capable of producing maximum gain of 20 dB.
- FCC Title 68
  Telephones capable of generating sound levels higher than normal must be equipped with an automatic reset function. For volume amplitude in excess of 18 dB, replacing the receiver restores the volume to the normal level.

e) Telephones are provided with adjustment of parameters other than sound in line with the auditory characteristics of the user.

Example 1

Adjustable sound quality (frequency characteristics).

Example 2

The ability to slow down the speaking rate is useful for older persons.

Example 3

Bone conduction technology is effective for certain types of hearing impaired persons (such as those with conductive deafness) and also in situations involving high levels of background noise.

f) Telephones do not cause noise in assistive technology such as hearing aids and artificial ears.

Note

This problem is known to exist with certain types of digital cordless telephones.

g) Telephones are compatible with induction coil (T-mode) hearing aids.

Notes

1. T-mode is a hearing aid function in which an external magnetic field is picked up by the induction coil, amplified and played from the earphone. The intensity of the magnetic field acting on

the induction coil is described in Note 2 below, while the
the hearing aid coil output magnetic field level in the telephone receiver relative to the hearing aid induction coil location is described in Note 3 below.

2. Magnetic field intensity required for hearing aid operation
   - IEC 60118-1 Ed. 3.1:1999 (b) Hearing aids - Part 1: Hearing aids with induction pick-up coil input
     JIS C 5512, Hearing aids

3. Telephone receiver hearing aid coil specifications
   - TIA specifications in the United States
     ANSI/TIA/EIA-504-A-1997
     Telecommunications-Telephone Terminal Equipment-Magnetic Field and Acoustic Gain Requirements for Handset Telephones Intended for use by the Hard of Hearing

Remark

The above specifications include specifications pertaining to the magnetic field intensity generated by the hearing aid coil in the receiver and acting on the induction coil in the hearing aid.

h) Where the receiver sound can be amplified, consideration is given to sound leakage.

Example

Receiver units that fit firmly onto the ear.

Notes

1. A loud receiver volume can create disturbance through sound leakage (see Section 5.6.1 on the impact on the surrounding environment) and also poses privacy concerns.

2. Ideally, an induction coil feature or external output terminal is provided.

i) A sidetone (the sound of the speaker's own voice in the earpiece) is provided.

Notes

1. Without the sidetone, a hearing-impaired person using a T-mode hearing aid (with microphone input off) would not be able to hear their own voice and would experience difficulty speaking. The sidetone allows the speaker to hear his or her own voice via the induction coil in the receiver.

2. See ITU-T P.310 (sidetone masking standards STMR: 10 – 15 dB)

6.2.1.8 Ring tones (melodies, ringer tones, etc.)

a) The ring tone volume must be adjustable.

Example 1

Can be made louder than standard volume.

Example 2

Parameters such as fundamental frequency and tone quality may be modified.

b) Visual confirmation of call incoming status also provided.

Example

Display flashes while ringing to indicate incoming calls.

Note

Refer to Section 5.3.2 regarding prevention of photosensitive epilepsy.

c) Mute function provided.

Note

See Section 5.6.1 on the impact on the surrounding environment.

d) Portable terminals are also equipped with vibration alert for incoming calls.

6.2.1.9 Alert tones and voice guidance

Where the device is capable of generating alert tones and voice prompts in addition to standard ring tones (such as melodies and ring tones), the provisions of Sections 6.1.7 and 6.1.8 on alert tones and voice guidance systems shall apply.

6.2.1.10 Confirmation of operations

a) Both visual and auditory confirmation of the telephone line status are provided.

b) Where remote number notification is available, details of information sent by both visual and auditory means can be confirmed.

6.2.1.11 Before first use

Requirements with regards to packaging, installation and connection prior to first use are set out in Sections 6.1.10 (materials), 6.1.11 (packaging) and 6.1.12 (installation and settings).

6.2.2 Basic operational requirements for facsimile machines

6.2.2.1 Basic features and functions

The basic features of a facsimile machine are sending and receiving a fax, making copies of a document, and replacing the ink or toner. The associated requirements are described below. Where provided, ordinary telephone functionality is subject to the provisions of Section 6.2.1 on the basic features of fixed-line telephones. Appendix 2, Disability design considerations for basic facsimile telephone operations, describes the basic operations in detail and explains the relevant considerations for different forms of disability.

6.2.2.2 Keys and buttons

6.2.2.2.1 Start, Stop and Copy buttons

a) The button names must be easy to read.

Example

Use a gothic font with character height of at least 3.0 mm and brightness difference of at least 4.0.

Reference

JIS S0012:2000, Guidelines for all people including older persons and persons with disabilities — Usability of consumer products

b) The Start, Stop and Copy buttons are distinct from other keys in both visual and tactile terms.

Example 1

A tactile dot of diameter 1.5 – 2.0 mm and height 0.5 – 0.8 mm is provided in the centre of the Start button.

Reference

JIS S0011:2000, Guidelines for all people including older persons and persons with disabilities — Marking tactile dots on consumer products

Example 2

A raised bar of diameter 1.5 – 2.0 mm and height 0.5 – 0.8 mm, measuring at least five times long as it is wide, is provided in the centre of the Stop button.

Reference

JIS S0011:2000, Guidelines for all people including older persons and persons with disabilities — Marking tactile dots on consumer products

JBMS-71: 2004, Office equipment — Auditory signals

c) Both visual and auditory confirmation are provided when the Start, Stop and Copy buttons are depressed.

Example 1

Except for tactile switches, buttons produce a click response with a finger pressure of around 100 g and stroke of around 0.8 – 1.2 mm.

Example 2

The input confirmation alert tone duration is 0.1 second (refer to JBMS-71 (JIS-S0013)).

6.2.2.2.2 Numeric keypad

Requirements for the numeric keypad are given in Section 6.2.1.3 on operation keys and the numeric keypad.

6.2.2.3 LCDs and other displays

Requirements for LCDs and other displays are given in Section 6.1.4 on LCDs and other displays.

6.2.2.4 Facsimile processing section

6.2.2.4.1 Original insert slot

a) The insert slot for the original is identifiable by both visual and tactile means. If there is another slot for printing paper, this is readily distinguishable from the original insert slot.

b) The shape and design of the original insert slot is such that the required orientation of the paper is intuitively obvious.

c) Both visual and auditory confirmation are provided when the original is inserted correctly.

Notes

1. The duration of the input alert tone when the original is inserted correctly is 0.1 second.

2. JIS S0013:2002, Guidelines for all people including older persons and persons with disabilities — Auditory signals on consumer products

JBMS-71: 2004, Office equipment — Auditory signals

d) The required orientation of the original (facing up or down) can be confirmed by both visual and tactile means.

Example

Use pictograph symbols that can be identified by touch.

6.2.2.4.2 Paper guides

a) The paper size indication is easy to see.

Example

Use a gothic font with character height of at least 3.0 mm and brightness difference of at least 4.0.

Reference

JIS S0012:2000, Guidelines for all people including older persons and persons with disabilities — Usability of consumer products

b) The paper guide sliders are easy to hold, do not require any rotation of the wrist, and offer little or no resistance to movement.

c) The position of the paper guides can be determined by sight or by touch.

d) The paper guide sliders feature a machine finished, non slippery surface.

6.2.2.4.3 Original and recording paper output slots

a) The output slots can be identified by both sight and by touch.

b) The design and shape of the original and recording paper output slots are such that the paper is easy to remove.

Example 1

The output slots are equipped with trays, and the paper is easy to remove.

Example 2

Where recording paper rolls are used, the paper is either easy to cut or is cut automatically.

Reference

Some users may need to cut roll paper using one hand only.

6.2.2.4.4 Confirmation of recording paper

a) The facsimile machine provides both visual and auditory confirmation when the recording paper is inserted correctly.

Example

The recording paper inserted confirmation alert tone duration is 0.1 second.

Reference

JIS S0013:2002, Guidelines for all people including older persons and persons with disabilities — Auditory signals on consumer products

JBMS-71: 2004, Office equipment — Auditory signals

b) The facsimile machine provides both visual and auditory confirmation when the recording paper runs out.

Example

When the recording paper runs out, a message appears on the display and an alert tone or voice message is played.

6.2.2.4.5 Maintenance cover

a) The maintenance cover is designed to be opened easily.

Example

The open button is located in a readily visible position, and the method for opening the cover is intuitively obvious from the shape of the cover or instructions provided thereon.

b) Both visual and auditory confirmation is provided when the cover is opened or closed.

Example

The cover clicks when opened or closed fully, or a click sound is generated by the machine.

c) The cover cannot be opened or closed accidentally.

Note

Injury could result if the cover is closed unintentionally.

d) The act of opening or closing the cover does not require great force.

6.2.2.4.6 Inserting consumables such as ink and paper rolls

a) Designed for easy opening.

b) Designed for easy insertion, with the orientation intuitively obvious.

Example

Where the direction of insertion is important, it cannot be inserted in the wrong direction.

c) No risk of injury if attempting to insert consumables by feel without looking.

Note

No sharp corners or edges in areas where the fingers can reach.

d) Correct insertion of consumables can be confirmed by feel and also by visual or auditory response.

Example

The relevant section clicks when the consumable has been inserted correctly, or a click sound is generated by the machine.

6.2.2.5 Alert tone and voice guidance

Refer to Section 6.1.7 on alert tones and Section 6.1.8 on voice guidance systems.

6.2.2.6 Confirmation of operations

a) Both visual and auditory confirmation of successful transmission is provided.

Example 1

An alert tone (transmission complete tone) sounds for one second when the facsimile has been sent.

Reference

JIS S0013:2002, Guidelines for all people including older persons and persons with disabilities — Auditory signals on consumer products

JBMS-71: 2004, Office equipment — Auditory signals

Example 2

The result of the transmission is displayed on the screen or printed out for confirmation.

b) Both visual and auditory confirmation is provided of incoming facsimiles (and associated telephone calls) .

Example

The device can be set to receive facsimiles automatically (without tone) but generate a ring tone for voice telephone calls.

c) Error details can be confirmed both visually and by auditory means.

Example 1

Urgent warning tones, such as fax transmission error, paper jam, or ink/toner low/empty, consist of five repetitions of five tones of 0.1 second (0.1 second) duration.

Reference

JIS S0013:2002, Guidelines for all people including older persons and persons with disabilities — Auditory signals on consumer products

JBMS-71: 2004, Office equipment — Auditory signals

Example 2

Non-urgent warning tones (tone 3), such as recording paper empty and original not removed, consists of four repetitions of five tones of duration 0.5 second (0.2 second).

Reference

JIS S0013:2002, Guidelines for all people including older persons and persons with disabilities — Auditory signals on consumer products

JBMS-71: 2004, Office equipment — Auditory signals

d) Both visual and auditory confirmation of copying is provided

Example

An alert tone (copying complete tone) sounds for one second when the copying process is complete.

Reference

JIS S0013:2002, Guidelines for all people including older persons and persons with disabilities — Auditory signals on consumer products

JBMS-71: 2004, Office equipment — Auditory signals

6.2.3 Basic operational requirements for mobile telephones

6.2.3.1 Basic features and functions

The basic functions of mobile telephones are Talk, Add to address book, Mail and Internet. The associated considerations are described below. Appendix 3, Disability design considerations for basic mobile telephone operations, describes the basic operations in detail and explains the relevant considerations for different forms of disability.

Notes

1. Today's mobile telephone is more than just a compact telephone for making voice calls; it is a multi-function mobile terminal offering a range of features such as e-mail, internet browsing, music player, and camera. These guidelines should therefore be applied in conjunction with the relevant information accessibility guidelines in other areas.

2. Refer also to Section 6.2.1 on basic functions of fixed-line telephones where relevant.

6.2.3.2 General requirements

General requirements pertaining to layout of the operating panel, operating procedures, terminology and materials are as per Section 6.1 above on common requirements for terminal equipment.

6.2.3.3 Shape and form

a) The device is easy to hold, non-slippery and evenly weighted.

b) The device can be operated using either hand.

Example

The device can be opened with a single push operation.

c) The device can be used in hands free mode, where it can be placed on a surface. During hands free operation, the orientation and angle of the screen and camera can be adjusted as necessary.

Notes

1. A hands free video phone function enables communication in sign language.

2. Persons who have difficulty holding a mobile telephone due to paralysis or tension in the hands will find it easier if the phone can be operated while placed on a surface.

d) The device is equipped with a strap.

Notes

1. Use of the strap by persons with reduced muscle strength reduces the risk of dropping the phone.

2. When the strap is used, the phone can be operated with one hand.

3. Providing multiple locations for attaching the strap allows the user greater choice to suit their own needs.

4. Multiple strap locations also allow a person with upper limb disabilities to wear a mobile phone around their neck.

e) The device is easy to close.

Example

Protuberances such as the antenna do not get in the way when operating or closing the device.

6.2.3.4 Buttons and numeric keypad

a) General requirements in response to all aspects of entry operations are as per Section 6.1.3 above on buttons and numeric keypad.

b) Input operations can be performed with either hand.

c) The Talk and End keys can be readily distinguished from other keys both by sight and by touch.

d) The numeric keypad can be readily distinguished from other keys and buttons both by sight and by touch.

Example

A tactile dot of diameter no less than 0.8 mm and height no less than 0.3 mm is provided in the centre of the number 5 key.

Reference

JIS S0011:2000, Guidelines for all people including older persons and persons with disabilities — Marking tactile dots on consumer products

e) Where use of a navigation button or directional push-button is required, a short cut procedure is also provided as an alternative.

Example

Persons with artificial limbs may have difficulty using navigation and directional buttons.

f) Press and hold operations are accompanied by an on-screen response or other form of feedback.

g) Alternatives are provided for all press and hold operations.

Note

Persons with artificial limbs or reduced muscle strength may be unable to perform press and hold operations.

6.2.3.5 LCDs and other displays

a) General requirements regarding displays are as per Section 6.1.4 above on LCDs and other displays.

b) Icon attributes such as size may be modified if required.

Note

Important icons such as battery level and signal strength are easy to see.

c) Text is easy to read.

Example

Text can be enlarged

d) Adjustable brightness and contrast.

Note

Since mobile phones are used in various environments, it is important to be able to adjust the brightness contrast so that the screen is visible in differing lighting conditions and viewing situations.

6.2.3.6 Printed information

Requirements regarding printed information are as per Section 6.1.5 above on printed information.

6.2.3.7 Voice guidance system

a) Displayed information can be replayed using voice guidance system.

Example

Voice guidance system reads out text shown on the display.

b) The voice guidance system can be used to confirm input operations.

Example

Voice guidance system reads out conversion characters during Japanese kanji input.

6.2.3.8 Alert tones and voice guidance

All aspects of alert tones and voice prompts are covered in Section 6.1.7 on alert tones.

6.2.3.9 Receiver sound

a) The volume can be adjusted, during a call if necessary, to accommodate background noise and personal taste.

Note

Volume level can be amplified to at least 12 dB above the nominal volume level, in accordance with ITU-T P.313.

Example

The volume can be adjusted without terminating a call in progress.

b) Parameters other than volume can be adjusted to suit the needs of the user.

Example 1

Sound quality (frequency characteristics) can be modified.

Example 2

Speaking rate is adjustable for the benefit of older persons.

Example 3

Bone conduction technology is effective for certain types of hearing impaired persons (such as those with conductive deafness) and also in situations involving high levels of background noise.

c) The device is compatible with induction coil (T-mode) systems.

Reference

FCC Acts to promote accessibility of digital wireless phones to individuals with hearing disabilities.

ANSI C63.19 — Method of measurement for hearing aid compatibility with wireless communications status.

ANSI C63.20 — Limits for hearing aid compatibility with wireless communications

d) The device does not cause noise in assistive technology such as hearing aids and artificial ears.

e) A sidetone (the sound of the speaker's own voice in the earpiece) is provided.

Notes

1. Without the sidetone, a hearing-impaired person using a T-mode hearing aid (with microphone input off) would not be able to hear their own voice and would experience difficulty speaking. The sidetone allows the speaker to hear his or her own voice via the induction coil in the receiver.

2. See ITU-T P.310 (sidetone masking standards STMR: 10 – 15 dB)

6.2.3.10 Confirmation of operations

a) Non-visual confirmation of signal strength is provided.

Example

Deterioration of signal strength during a call is indicated by an alert tone or voice guidance.

b) Non-visual confirmation of battery level is provided.

Example

Low battery level before or during a call is indicated by an alert tone or voice guidance.

c) Non-visual confirmation of settings such as phone lock and silent mode is provided.

Example 1

Switch provides tactile confirmation of setting status.

Example 2

Phone lock status can be confirmed via vibration or voice guidance.

d) Adjustable ring volume.

Example 1

Volume level can be increased or decreased relative to base level.

Example 2

Parameters such as fundamental frequency and tone quality can be modified.

e) Visual confirmation of call incoming status also provided.

Example

Display flashes while ringing to indicate incoming call.

Note

Refer to Section 5.3.2 regarding prevention of photosensitive epilepsy.

f) Vibration feature can be used to alert user to incoming call or transmission.

Example 1

Selected combinations of vibration strength and pattern can be assigned to incoming calls and incoming transmissions in order to distinguish between the two.

Example 2

A separate vibrating extension can be wirelessly connected to the mobile phone to provide vibrating alerts.

6.2.3.11 External interface

The general requirements of the external interface are as per Section 6.1.13 regarding alternative procedures and Section 6.1.14 regarding interface specifications.

a) An external input device can be connected in order to provide an alternative to the compact numeric keypad.

Note

Compact numeric keypads and buttons can pose difficulties for sufferers of involuntary movement and persons with fine motor control impairment.

b) An external display can be connected in order to provide an alternative to the compact display.

Notes

1. Video phone functionality enables users to track lip movement and detailed finger movements; this is made easier by a larger screen.

2. A large screen facilitates phone operations by older persons and persons with intellectual disabilities.

6.2.4 Basic operational requirements for video phones

6.2.4.1 Basic features and functions

The basic functions of video phones are the same as the standard telephone functions, plus the functionality to enable callers to see one another. The associated considerations are described below. Appendix 4, Disability design considerations for basic video telephone operations, describes the basic operations in detail and explains the relevant considerations for different forms of disability.

6.2.4.2 General requirements

General requirements pertaining to layout of the operating panel, operating procedures, terminology, overall shape and materials are as per Section 6.1 above on common requirements for terminal equipment.

a) The basic operational requirements of fixed-line and set-top telephones are as per Section 6.2.1 above on fixed-line telephones.

b) The basic operational requirements of mobile and video telephones are as per Section 6.2.3 above on mobile telephones.

6.2.4.3 Buttons and numeric keypad

6.2.4.3.1 Talk, Video and End buttons

a) Button labels are easy to read.

b) The Talk, Video and End buttons are distinguishable from other buttons by look and by feel.

c) Both visual and auditory confirmation is provided when the Talk, Video or End button is depressed.

6.2.4.3.2 Numeric keypad

For the keypad, refer to Section 6.2.1.3 above on buttons and numeric keypad.

6.2.4.4 LCDs and other displays

See Section 6.1.4 above on LCDs and other displays.

6.2.4.5 Video functionality

a) Parameters such as frame rate and resolution are designed to facilitate sign language and other forms of visual communication.

Example

The frame rate is described in Section 7.1.1 below on real-time reproduction.

6.2.4.6 Camera

a) Camera parameters such as direction and scope can be modified.

Example 1

In order to transmit sign language, the video phone must be capable of showing both hands and the upper torso.

Example 2

The video phone can be used by visually impaired persons to send and receive visual information such as text and color.

b) At least one external camera input circuit is provided in addition to the normal camera.

Note

Documents or images can be shot at close range and enlarged to improve readability.

c) Auto focus functionality is provided on cameras using lenses with shallow depth of field, such as telephoto, zoom and macro lenses.

d) Auto exposure (or auto iris) functionality is provided.

e) Where the camera is equipped with power zoom and/or pan/tilt functionality, the remote party is also able to control the zoom and pan/tilt movement. The remote control feature can also be barred.

Notes

1. A person without disabilities can use remote camera control to enhance communication with a visually impaired person.

2. The speaker can bar remote camera movement and restrict the camera view to a designated area.

6.2.4.7 Hands free operation

Hands free operation is described in Section 6.2.1.4 c) above.

Note

Hands free video phone operation is ideal for transmitting sign language.

6.2.4.8 Confirmation of operations

a) Devices with multiple video inputs provide a non-visual (auditory or tactile) means of determining which camera is connected as an alternative to checking on the video monitor.

b) The transmitted video image can be checked prior to beginning a video phone call.

c) The transmitted video image can be checked during a call.

d) The camera direction can be determined via tactile means.

e) On cameras equipped with zoom, the zoom position can be confirmed via tactile or auditory means without viewing the image.

Example

Zoom in and zoom out operations are confirmed by the voice guidance system.

6.2.4.9 Installation and settings

Except where performed by a service technician, installation and initial settings are as per Section 6.1.12 above on installation and settings.

7 Requirements for telecommunications services

This section sets out the relevant considerations pertaining to the planning, development and

design of telecommunications services.

Note

Enhancing the accessibility of telecommunications services can be achieved by improving the accessibility of terminal equipment, adding accessibility features to services, or a combination of both.

Example

Vision-impaired persons can utilize text-based information services with the help of voice synthesis technology built into the device, or equivalent services can be provided in voice format.

7.1 Mediated interactive telecommunications services

This section describes requirements for mediated interactive telecommunications services.

7.1.1 Real-time transmission

Where technically feasible, interactive text, image and video functionality is expected to satisfy the following requirements:

• Remote party calling

• Simultaneous two-way transfer of data (full duality)

• No delay or minimal delay with no impact on communication

• No information loss, or minimal information loss with no impact on communication

Note 1

The above functionality is provided for voice calls; where feasible, it can be provided in other media forms, for the benefit of persons with speech difficulties caused by hearing or language impairment.

Example 1

Line switching (direct) mail: the originating caller specifies a remote party and is either connected immediately or informed that the call has failed. Simultaneous two-way data transfer (chat style communication) involves full duality design.

Example 2

Instant messaging services: requires both parties to be connected to the server or equivalent. Text (and accompanying data) is transmitted with minimal delay.

Example 3

Text and image data transmitted via modem over standard telephone lines: requires both parties to use text telephones employing the same communication protocols.

Note 2

Tele-Typewriter terminals, as used in the USA: consisting of a text readout display, keyboard and modem, the Tele-Typewriter (TTY) can be used to transmit text via modem over standard telephone lines to a remote TTY.

Note 3

ITU-T V.18 lists text telephone communication protocols used around the world; available characters are limited to the 7-bit ASCII set.

Example 4

Slow, simple sign language or other forms of visual communication can be transmitted over two-way video systems such as video phones using frame rates as low as 10 fps. However, a frame rate of 30 fps (equivalent to the analogue television broadcasting) is necessary to understand sign language performed at normal speed and to enable lip reading or equivalent.

7.1.2 Multimedia

Two-way communication services involving combinations of different media (such as text and voice) are supported, where technically feasible.

Note

Many hearing disabled persons have difficulty hearing but are able to speak normally, and would therefore benefit from a communication system involving a combination of speech on their part and text or other form of visual communication from the remote party. Similarly, a system in which the two parties converse normally, only resorting to text when hearing difficulties are encountered, would prove useful for some hearing disabled persons.

7.1.3 Compatibility

Where technically feasible, interactive text, image and video communication are supported among different carriers and devices.

Note

Line switching mail, as described in Example 1 in Section 7.1.1 above, theoretically provides instant communication in real time; at present, however, due to compatibility issues among carriers, this is only possible between users of devices that are compatible with the service.

7.1.4 Media conversion

Media conversion services (such as voice to text) are provided where technically feasible.

Example 1

Telephone relay services are provided for hearing impaired persons who are unable to use ordinary telephones.

Note

Telephone relay services based on TTY and similar technology are being introduced in the United States and elsewhere. Telephone relay services involve a combination of voice and text transmission mediated by an operator. The operator communicates with the TTY user (generally a person with hearing or language difficulties) via text, and reads the text aloud to the other party (generally a person with no hearing difficulty). The operator then converts the other party's spoken response into text for the benefit of the TTY user.

Example 2

A service in which e-mails are read out by a voice synthesis system and can be heard on the telephone.

Example 3

Voice mail services.

7.2 Telecommunications platform services

This section sets out requirements in relation to telecommunications platform services.

7.2.1 Alternative media

Certain types of information cannot be subject to media conversion by terminal equipment. In this case, provision should be made to enable information providers to provide information services via alternative media.

Example

Voice portal services using voice recognition and/or voice synthesis technology for the benefit of visually impaired persons.

7.2.2 Media conversion

Media conversion services (such as voice to text) are provided, where technically feasible.

7.2.3 Multimedia content information alternatives

Where multimedia content is supported, provision should be made to enable information providers to supply text or other alternatives to non-text information.

Example

Where information is provided in the form of video with sound, the information provider also supplies captions and descriptive text synchronized with the video.

7.2.4 Device identification

Where the network is capable of determining the characteristics of a terminal device, provision should be made to enable information providers to supply content tailored to the characteristics of the device.

Example

CC/PP is used to transmit web content tailored to individual terminal characteristics such as screen size, resolution, number of colors, sound and screen enlargement.

7.3 Emergency calls

An accessible means is provided for making emergency calls and confirming personal safety.

Example 1

Persons with speaking difficulties can use a means other than conventional voice calling to contact emergency services such as the police (110), fire and ambulance (119) and personal safety services.

Example 2

Where communication is restricted in order to prevent congestion of lines during an emergency, persons with speaking difficulties are able to contact emergency services via e-mail or other alternatives.

7.4 Telecommunications services specifications

Where possible, standard specifications should be used in the development and design telecommunications services in order to promote the development and usage of assistive technology for older persons and persons with disabilities. Where non-standard specifications are used, these should be made available in the public domain where possible.

Notes

1. In addition to physical terminal equipment, network specifications such as communication protocols are necessary for the development of assistive technology for older persons and persons with disabilities.

2. Standardization of specifications between different carriers and platforms helps to promote the usage of assistive technology for older persons and persons with disabilities.

8 Requirements for planning, development, design and evaluation processes

In order to enhance telecommunications accessibility, developers are expected to incorporate the basic requirements of these Guidelines into the planning, development, design and evaluation of telecommunications equipment and services. End user representatives should be included in these processes in order to ensure that the views and suggestions of users are incorporated into the relevant processes. The accessibility of network-based telecommunications services at the device end should be determined on the basis of comprehensive studies of servers, transmission formats and device functionality used to render the services. Operators and developers must ensure that these considerations are incorporated into the planning, development and design of telecommunications equipment and services, in line with specific telecommunications accessibility guidelines.

8.1 Planning, development and design considerations

Planning, development and design considerations are detailed in JIS X8341-1:2004, Guidelines for older persons and persons with disabilities — Information and communications equipment, software and services — Part 1: Common Guidelines, Chapter 5, Planning, Development and Design.

8.2 Evaluation considerations

8.2.1 Scope

Evaluation of telecommunications accessibility should apply to the widest possible range of products.

8.2.2 Methodology

Telecommunications accessibility evaluations involve preparation of operation checklists as shown in Appendices 1 through 4, which outline important considerations for different forms of disability, based on an overall appreciation of the principles underlying these Guidelines. The

evaluation process should be conducted from the perspective of the end user.

Note

The checklists provided in Appendices 1 through 4 set out important considerations with regards to the performance of basic operating procedures on standard devices by persons with physical or mental impairment. Developers can use the checklists to identify operations and procedures that could potentially cause difficulties among older persons and persons with disabilities. When a specific design initiative is judged to be beneficial in terms of the checklist criteria, an operation can be evaluated with respect to a given physical or mental disability to determine whether all operations in a sequence are possible. If some of the operations have not been modified to take account of the needs of older persons and persons with disabilities, then such users may experience difficulty operating the device.

8.2.3 Evaluation by users

Information accessibility and user-friendliness evaluations performed by older persons and persons with disabilities should be incorporated into the planning, development and design processes.

Notes

1. Incorporating user input from the planning and development stages enables developers to design user-friendly telecommunications equipment and services.

2. JIS Z8530:2000, Human-centered design processes for interactive systems.

9 Requirements for user support

9.1 User manuals

Product users manuals should be provided on several different forms of media to maximize accessibility for persons with disabilities.

Note

Electronic documents (identical to the printed versions) are provided without condition and at no extra cost. Electronic documentation enables persons with visual impairment, who have difficulty reading printed documents, to access the information contained in user manuals by using screen readers or Braille data converters, or by printing out an enlarged version of the document.

Example 1

User manuals are supplied to visually impaired users in Braille or recorded book form.

Example 2

User manuals are written in large, easy-to-read font types suitable for older persons.

Example 3

A simplified version of the user manual describing only the basic procedures is also provided.

9.2 Support initiatives at the retail end

Information about the telecommunications accessibility of a product should be supplied to retailers, information service providers and support providers, in line with the following

requirements:

a) Extensive product information (including product specifications, compatibility with other brand products, Q&A, usage information, and other important considerations) is provided in order to assist consumers with disabilities in selecting the right telecommunication terminal equipment and peripheral equipment to suit their objectives, usage environment and degree of disability.

b) In order to ensure that all consumers with disabilities are able to choose the best product for their needs, retailers are supplied with information about the suitability of different products for users with varying degrees of sensory disabilities (such as vision and hearing), physical disabilities (such as general body frame and muscle strength) or cognitive disabilities (such as understanding of written words).

9.3 Customer support centers

a) Customer support centers are able to provide information in a variety of forms to suit consumers with different needs. Customer support centers are also set up to enable communication with persons with disabilities.

Example 1

Facsimile and e-mail support services are ideal for persons with auditory and/or language disabilities who may have difficulty using the telephone.

Example 2

Telephone support services are necessary for persons with visual disabilities who may have difficulty reading information on a web page.

b) In addition to providing information about the relevant products, customer support centre operators have a thorough grounding in disability and information security issues and are able to communicate freely with persons with disabilities.

c) Customer support centers are set up to field enquiries regarding compatibility issues and the accessibility features of their products.

9.4 Availability of accessibility information

Product accessibility information should be made widely available in the public domain.

Notes

1. Making product accessibility information widely available in the public domain enables consumers with disabilities to select the right product for their particular needs.

2. Where a product is manufactured or sold by a combination of companies, at least one of them should be responsible for releasing the required accessibility information into the public domain.

9.4.1 Scope

Telecommunications accessibility information for as many products as possible should be released into the public domain.

9.4.2 Methodology

The results of telecommunications accessibility evaluations of products should be released to the widest possible consumer audience, including but not limited to older persons and persons with disabilities.

Notes

1. Evaluation results are generally posted on the Info-Communication Access Council website (http://www.ciaj.or.jp/access) in accordance with the procedure described in Appendix 5, and may also appear on the websites of the product developers and in other forums.

2. Evaluation results are presented in the form of a list of the requirements set out in these Guidelines, based on the checklist shown in Appendix 6, Sample accessibility evaluation checklist for fixed line telephones.

9.4.3 Telecommunications accessibility logo

Where a product developer is satisfied, on the basis of in-house testing and investigation, that a product fulfils the accessibility criteria laid down in these Guidelines, the product developer is permitted to use the telecommunications accessibility logo approved by the Info-Communication Access Council on the product and on associated promotional material, packaging and documentation such as user manuals. Use of the accessibility logo is governed by the requirements set out below. Where the logo is used on anything other than the product itself (such as promotional materials), it should be accompanied by a description of the relevant accessibility feature or functionality.

This product is equipped with a voice guidance system and can be used without viewing the display.

Example

"This product is equipped with a voice guidance system and can be used without viewing the display."

The above is an example of descriptive sentence for a product that can be operated and/or utilized by persons who have difficulty interpreting visual information.

Note that accessibility evaluation results and other relevant information for all products bearing the accessibility logo must be provided on the Info-Communication Access Council's website.

End

Secretariat to the Info-Communication Access Council: the Communication and Information Network Association of Japan (CIAJ)