INTERNATIONAL STANDARD

ISO/IEC 24757

First edition
2008-11-01

Information technology — Keyboard interaction model — Machine-readable keyboard description

Technologies de l'information — Modèle d'interactions sur claviers — Description de clavier lisible à la machine

Reference number
ISO/IEC 24757:2008(E)

© ISO/IEC 2008

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2008

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

© ISO/IEC 2008 – All rights reserved

Not for Resale

Contents

Page

Foreword ... iv

Introduction ... v

1 Scope ... 1

2 Conformance ... 1

3 Normative references ... 1

4 Terms and definitions ... 1

5 Requirements ... 2
5.1 Description of keys and keyboard layouts ... 2
5.2 States resulting from the interaction of function keys used for input ... 2
5.3 Special keys ... 4
5.4 Dead keys ... 4
5.5 Stickiness and stable (explicit) locking or temporary (implicit) latching ... 5
5.6 Supplementary keys (accessible or not by the computer software) ; Email, Fn function keys, «Windows» keys, Sleep, On/Off) ... 6
5.7 Complex state change (mainly for accessibility purposes) ... 6
5.8 Keyboard feedback ... 6
5.9 Machine-readable keyboard description language ... 6

Annex A (normative) **Protocol for the exchange of information between the hardware keyboard and the software** ... 8

Annex B (normative) **Formal description language** ... 9
B.1 Introduction ... 9
B.2 Overview ... 9
B.3 Sections ... 9
B.3.1 Dictionaries ... 9
B.3.2 Meta-information ... 10
B.3.3 Non-functional information ... 10
B.3.4 Functional information ... 10
B.4 A specification in RELAX NG language of the keyboard description format ... 11
B.5 A description in EBNF language of the keyboard format ... 14
B.5.1 Rules for BNF syntax ... 14
B.5.2 Grammar for ISO/IEC 24757 Relax NG descriptions ... 15
B.6 An example keyboard description ... 16
B.7 Format in XML syntax ... 17

Annex C (informative) **Brief History of computer keyboards and their associated software** ... 24
C.1 The IBM keyboard ... 24
C.2 The AT and PS/2 keyboard ... 24
C.3 The USB keyboard ... 25

Annex D (informative) **Format Mapping** ... 26
D.1 General ... 26
D.2 Unix/Linux X Window xkb keyboard format ... 26
D.2.1 xkb description ... 26
D.2.2 xkb example ... 26
D.2.3 Example of keyboard description in ISO/IEC 24757 syntax ... 54
D.2.4 Program to convert xkb descriptions to ISO/IEC 24757 format ... 122

Bibliography ... 136

© ISO/IEC 2008 All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 24757 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 35, *User interfaces*.

--`,,```,,,,````-`-,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Introduction

This International Standard is intended for those who design operating systems or software applications which take account of the keyboard being used (including the complete presentation of the keyboard on screen for documentation purposes). Its goal is to harmonize industry practices with regard to machine-readable keyboard descriptions (PCs, PDAs, Linux, Windows, Apple, etc.). Its ultimate aim is to facilitate the production of interoperable drivers for the user and to better assist the user by offering a more precise mapping between the physical keyboard layout and geometrical configuration, and the logical interface available to the operating system and its applications.

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

--`,,```,,,,````-`-`,,`,,`,`,,`---
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Information technology — Keyboard interaction model — Machine-readable keyboard description

1 Scope

This International Standard provides a formal description format that can not only fully describe the international keyboards standards, but also the capabilities of keyboards in the marketplace of today and the foreseeable future and their functioning with corresponding operating systems. It describes possible interactions between the keys of a keyboard and standardizes the keyboard description so that it is machine-readable while staying relatively easy to interpret by human beings.

2 Conformance

The machine-readable description of a keyboard is in conformity with this International Standard if it meets the requirements of 5.1 to 5.9.

3 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 639-1, *Codes for the representation of names of languages — Part 1: Alpha-2 code*

ISO 639-2, *Codes for the representation of names of languages — Part 2: Alpha-3 code*

ISO/IEC 9995-1, *Information technology — Keyboard layouts for text and office systems — Part 1: General principles governing keyboard layouts*

ISO/IEC 9995-2, *Information technology — Keyboard layouts for text and office systems — Part 2: Alphanumeric section*

ISO/IEC 9995-3, *Information technology — Keyboard layouts for text and office systems — Part 3: Complementary layouts of the alphanumeric zone of the alphanumeric section*

ISO/IEC 10646, *Information technology — Universal Multiple-Octet Coded Character Set (UCS)*

4 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 9995-1 and the following apply.

4.1
reference coordinates
identifier formed by one letter and two decimal digits, referring to the numbering grid according to which a key can be positioned at the intersection of a row and a column of the keyboard, where rows are identified by letters and columns by digits

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

5 Requirements

5.1 Description of keys and keyboard layouts

The keyboard is described for machines in this International Standard using the following properties:

- the logical coordinates of each key according to a grid numbering system established in ISO/IEC 9995-1. These coordinates are called “reference coordinates”;

  NOTE The reference coordinates of a keyboard may refer to a keyboard standard.

- the description of the size in millimeters (mm), shape and physical coordinates of each key of a hardware keyboard, to allow reproducing the user’s keyboard precisely on a computer screen; a binding is made with the reference coordinates;

- optionally, principal region or country and language codes applicable to this layout;

- actual labeling appearance;

- the logical division of each key of the keyboard into groups and levels within each group.

Within a group, at a given level, each character is described using five other properties:

- by a string of identifiers from ISO/IEC 10646, consisting of the letter "U" followed by 8 or 4 to 6 hexadecimal digits; if the character is a composed or combined character, identifiers of the individual characters making up the resulting character are given with the sequence that allows this composition;

- optionally, by its character name in a given natural language, identified according to ISO 639-1 code or ISO 639-2 terminology code;

- optionally, by one or many "scan codes" (which may vary depending on the keyboard state, on the hardware in use, etc.);

- in case a key position makes a key become a dead key, a description of user-required combinations, with resulting character or characters;

- optionally, a tag to identify characters whose glyph engraved on the key top is different from its internal representation (e.g., U00A6 broken vertical bar vs. U007C solid vertical bar).

NOTE The description of required combinations does not preclude the keyboard drivers to generate other characters if these combinations are already defined. The description mentioned here makes sure that what the end-user needs is taken care of, regardless of previous definitions.

This description includes the interaction of keys between them to produce results.

The following clause describes the different states of a keyboard necessary to the input of characters and taken into account in this International Standard.

5.2 States resulting from the interaction of function keys used for input

Hitting one of the following function keys determines a state of the keyboard that produces the desired character. This clause standardizes the conventional states produced by the interaction of these keys with alphanumeric keys.

- Level 2 Select (also called «Shift): per se, this key allows input of level 2 characters in the active group.

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

- Level 3 Select (also called « AltGr »): per se, this key allows input of level 3 characters in the active group.

- Control: this key is often used in practice with one of the preceding keys for entering characters. See below the interpretation that this International Standard prescribes for these interactions.

- Group Select: per se, this key allows changing group. This action may be locking or not.

  ISO/IEC 9995-2 specifies what follows to this effect :

  For the input of graphic character repertoire of collection 281 (titled MES-1) as specified in ISO/IEC 10646-1:2000/Amd.1, a Common Secondary Group Layout (to be used as group 2) is specified in ISO/IEC 9995-3. Specifically for group 2, the activation of group 2 with the Group select function is recommended to be latching for the next character entered and for this character only. In other words, activation of group 2 changes the logical state of the keyboard so that all keys involved in this activation can be released, and still, the next key typed will be selecting a character in group 2. After typing such a character in this mode, the keyboard then reverts back automatically to the group active before group 2 was activated.

  NOTE It is recommended, when a group which defines a complete script (e.g. Hiragana, Katakana, Cyrillic, Greek, Arabic, Hebrew) is selected, that the group be locked in this position until another group select or a de-selection is done (e.g., after Hiragana is selected, returning to Group 1 is typically done by explicitly deselecting Hiragana). The exact way to activate the group selection with a Group Select function is not standardized at this point. It is recommended that at the minimum any Group locking, except for group 1 and group 2, be visually indicated by an appropriate means (e.g. lamp, LCD or screen indication). Ideally the actual group in use should at any time be identified to the user.

- Usual combinations of certain function keys and their standardized interpretation:

  a) *Level 2 Select* + *Level 3 Select* (Shift+AltGr) shall be interpreted as follows (two scenarios are possible):

     1. According to ISO/IEC 9995-2 : « Specifically, for the harmonized 48 graphic key keyboard arrangement, when characters are allocated in more than one group, the *Group select* function shall be activated by holding a *Level 3 select* key *[AltGr]* depressed while depressing a *Level 2 select [Shift]* key or vice-versa. » One will understand that releasing these two keys without hitting a third key at the same time shall have the same effect as hitting a dedicated *Group Select* key.

     2. If an alphanumeric key is hit while the *Level 2 Select* and *Level 3 Select* are depressed, the state of the keyboard shall be interpreted as providing access to a group related to the previously active group, but different, at level 1. Certain implementations consider this as equivalent to a virtual level 4 in the active group. Although that does not correspond to a standardized concept, this view is tolerable in a restricted linguistic circle.

  b) *Level 2 Select [Shift]* + *Control* shall be interpreted as follows:

     If an alphanumeric key is hit while the *Level 2 Select [Shift]* and *Control* are depressed, the state of the keyboard shall be interpreted as providing access to a group related to the previously active group, but different, at level 2. Certain implementations consider this as equivalent to a virtual level 5 in the active group. Although that does not correspond to a standardized concept, this view is tolerable in a restricted linguistic circle.

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

c) *Level 3 Select [AltGr]* + *Control* shall be interpreted as follows:

If an alphanumeric key is hit while the *Level 3 Select* and *Control* are depressed, the state of the keyboard shall be interpreted as providing access to a group related to the previously active group, but different, at level 3. Certain implementations consider this as equivalent to a virtual level 6 in the active group. Although that does not correspond to a standardized concept, this view is tolerable in a restricted linguistic circle.

d) *Level 2 Select [Shift]* + *Group Select* shall be interpreted as follows:

If an alphanumeric key is hit while the *Level 2 Select* and *Group Select* are depressed, the state of the keyboard shall be interpreted as providing access to a group related to the previously active group, but different, at level 2. Certain implementations consider this as equivalent to a virtual level 5 in the active group. Although that does not correspond to a standardized concept, this view is tolerable in a restricted linguistic circle. As an example, in the context of ISO/IEC 9995-3, where group 1 is a Latin national group and where the related group is group 2 (« *Common Secondary Group Layout* » according to ISO/IEC 9995-3 nomenclature), the state of the keyboard locates the next character entry in Group 2, at level 2.

e) *Level 3 Select [AltGr]* + *Group Select* shall be interpreted as follows:

If an alphanumeric key is hit while the *Level 3 Select* and *Group Select* are depressed, the state of the keyboard shall be interpreted as providing access to a group related to the previously active group, but different, at level 3. Certain implementations consider this as equivalent to a virtual level 6 in the active group. Although that does not correspond to a standardized concept, this view is tolerable in a restricted linguistic circle. As an example, in the context of ISO/IEC 9995-3, where group 1 is a Latin national group and where the related group is group 2 (« *Common Secondary Group Layout* » according to ISO/IEC 9995-3 nomenclature), the state of the keyboard locates the next character entry in Group 2, at level 3.

5.3 Special keys

The following function keys exist on different commercialized keyboards. Their type can be generalized according to needs.

a) In Japan, texts can be edited in phonetic script (kanas) or in kanji (Chinese characters). In Korea a similar method is used to convert hangul (Korean letters) into hanza (Chinese characters). A kana-kanji (or hangul-hanza) conversion key allows converting a series of phonetic characters already entered into Chinese characters (kanji or hanza) on the fly. This key is not used to enter characters in conjunction with other keys but must be described as a special function key that involves a transformation program for already entered characters.

b) On certain keyboards outside of Japan or Korea, there exists a combine key that plays a role similar to the kana-kanji key but which is generalized for the generation of characters unavailable on the keyboard from characters already entered on it (fictional example: generating character § from the merging of the two characters s and s, or S and S, or from any combination of these two characters). The functioning of this combine key is not standardized at the moment. On certain keyboards, composition is transitive while on others it is more of a static nature. As for the kana-kanji or hangul-hanza conversion key, hitting the combine key involves a transformation program for already entered characters.

5.4 Dead keys

Certain keys are called «dead keys» because hitting them generates a partial character which may or may not appear on the screen. The complete character (also called «fully formed» or «precomposed») is generally made of a base letter and of one or many diacritical marks.

--`,,```,,,,````-`-`,,`,,`,`,,`---
© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

NOTE ISO/IEC 9995-3 says what follows about generating fully-formed characters with the help of dead keys:

«Diacritical marks appear above or below certain letters, and all of them are non-spacing characters. Actuating a key with a diacritical mark, followed by actuating a key with a letter, shall indicate that the graphical symbols of the two characters are intended to be combined. Actuating a key with a diacritical mark, followed by actuating the space bar, shall indicate that the diacritical mark is intended to appear as a graphic character of its own (i.e. free-standing).

It is recommended that the method used for the deletion of a character should also be used to cancel a partially-constructed character, such as a diacritical mark without a following letter or a following Space character.»

NOTE Diacritical marks may also appear everywhere around the body of a letter or even inside it.

To this can be added that dead key usage may also be transitive, like for the case of combine keys, i.e. certain scripts (polytonic Greek, Vietnamese) require the possibility to enter more than one diacritical mark on a single base letter. Unless the base letters are directly available on the keyboard, precomposed with a first diacritical mark integrated to the letter (as in the case of Scandinavian å, which can also be affected by other diacritical marks), it is then necessary that the function of entering diacritical marks be transitive, i.e. the entry of multiple diacritical marks in a row be applicable to the base character which comes after these marks.

5.5 Stickiness and stable (explicit) locking or temporary (implicit) latching

The state of a keyboard may be locked in a stable or temporary fashion, generally after activating a key or a key sequence.

5.5.1 Stable locking (explicit)

The following keys or functions activate a stable locking, which is deactivated in pressing another time on the same key or in calling the same function:

- Capitals lock
- Level 2 lock
- Group lock
- Numeric lock

5.5.2 Temporary latching (implicit)

ISO/IEC 9995-3 recommends, when one presses the *Group selection* key, that the state of the keyboard be locked for the entering of the next key only (see also 5.2 under *Group select*). In fact this behaviour depends on the nature of the group invoked, and could apply to groups other than group 2. Group 2 has dead keys whose accents are applicable to basic Latin characters normally found in the group that prevailed before invoking group 2. It is logical to go back to the preceding group for hitting this key. Other characters of group 2 are also infrequently used characters.

Another group which contains infrequent characters may have this temporary latching property. The group definition must then have provision for this implicit temporary latching property (otherwise the group shall be locked explicitly).

5.5.3 Stickiness (accessibility)

Stickiness is a temporary function latching property applicable to function keys normally used in conjunction with other keys. The first use is to allow handicapped people to hit keys one by one, without having to type two keys simultaneously (for example for entering the initial capital letter of a sentence, the fact to hit the *Level 2 select* key in this mode will lock the state of the keyboard in capitals just for entering the next key).

In «sticky» mode, successively hitting function keys and releasing them, one by one, is equivalent to virtually maintaining a pressure on all these keys at the same time as long as an alphanumeric key has not been hit. At this moment only, the virtual depression of these function keys is deactivated.

--`,,```,,,,````-`-`,,`,,`,`,,`---
© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

The stickiness mode is activated in depressing a *Level 2 select* key five times in a row. It is deactivated in depressing again a *Level 2 select* key five times in a row.

5.6 Supplementary keys (accessible or not by the computer software) ; Email, Fn function keys, «Windows» keys, Sleep, On/Off)

Even if these keys send a scan code already processed by the computer, they shall be described like other keys, since technically they do not constitute exceptions to what the keyboard description could contain.

Other keys (those not sending a scan code to the computer) may be described narratively as the software might have to be aware of their existence and geometric placement on the keyboard for helping the user.

5.7 Complex state change (mainly for accessibility purposes)

This clause standardizes the following state changes:

Successively hitting *Level 2 select* five times in a row:

Hitting *Level 2 select* during 10 seconds:

[*Alt*][*Level 2 select*][*Print Screen*]:

etc.

5.8 Keyboard feedback

A protocol for the operating systems is specified in Annex A to precisely enquire the hardware for the precise keyboard model used. The response from the keyboard hardware is with a file respecting the keyboard description format specified in clause 5.9. This functionality is optional in this International Standard, and it implements "plug-and-play" functionality for keyboards.

5.9 Machine-readable keyboard description language

The keyboard description format is meant to be capable of describing existing capabilities of today's keyboard hardware and its associated software, plus foreseeable extensions. It is therefore desirable to define the format in an extensible international standard format like ISO SGML, in the form known as *ISO RELAX NG*, with an easy conversion to industry standard XML. The format is described in Annex B (normative).

The keyboard definition format is primarily intended to be used by the operating system, and during its boot process (eg. in the BIOS), but can also be used for other purposes, such as reporting from the hardware of a keyboard to help the operating system configuring the keyboard driver, or to present the keyboard on the screen with a user-friendly picture.

A good test whether the format is capable of supporting existing software is to do a mapping to predominant keyboard description formats and techniques such as Microsoft keyboard definitions, X keyboard definitions, UNIX command line keyboard definitions and industry standard XML. A description of different industry standard formal keyboard description formats and their correspondence to the formal keyboard description format defined in this International Standard is included in Annex D (informative).

In addition some functionality found in some products are covered, such as keyboards with programmable keys and keyboards with multiple key assignments such as telephone keypads.

The keyboard definition format is described in 4 sections:

1. a keyboard identification and general features section, including make and model, serial number, country or region and language to which the keyboard applies, engraving language identification, and distinctive features, such as relief, or presence of lights on keys.

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

2. the hardware geometry layout, which indicates a largely known geometry layout, such as a 102-key PC keyboard. This section also gives physical information such as size of keys, and amount of pressure needed to activate keys.

3. the keyboard layout, which gives the actual assignment of characters to each key.

4. key combinations which gives combinations of keys, such as those of characters affected by dead keys.

Any of the information may be left out, and the operating system or the user may override the information according to preferences. The order of precedence in the information modification is first the user, then the system and then the description coming from the hardware.

In the informative Appendix E a number of existing keyboard definition formats is described, together with a mapping between these description formats and the format defined in this International Standard.

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Annex A
(normative)

Protocol for the exchange of information between the hardware keyboard and the software

A protocol is defined here to make a conforming keyboard report its configuration to the operating system. The report shall be data in accordance to Annex B.

The command to ask the keyboard to report its configuration is issued by the operating system via the sequence:

Set caps Lock
set num lock
clear num lock
set num lock
clear caps lock
clear num lock

NOTE Refer to Annex C for a description of some different stages in history of keyboard hardware and associated software.

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
© ISO/IEC 2008 – All rights reserved
Not for Resale

Annex B
(normative)

Formal description language

This Annex specifies semantic and syntax for the keyboard description format defined in this International Standard.

B.1 Introduction

The keyboard description is represented as XML document, conforming to the formal definition expressed using RELAX NG syntax (see 1.). The purpose of the keyboard description is to provide the operating system (OS) and user applications with non-ambiguous complete explanation of the physical keyboard features and recommended usage: keycodes, indicators, modifiers, produced characters etc. The description is expected to be provided from hardware (wherever possible) or from the keyboard driver (for legacy hardware).

B.2 Overview

The keyboard description generally consists of 4 sections:

dictionaries

meta-information

non-functional information

functional information

Each section is represented as 2nd level XML sub-tree. The sections are not self-contained – functional and non-functional information refers to the elements defined within the first section of dictionaries.

B.3 Sections

B.3.1 Dictionaries

There are 4 dictionaries defined in the document:

- keycodes
- modifiers
- key types
- key interpretation rules

B.3.1.1 Keycodes

The list of keycodes contains set of pairs (string identifier, numeric keycode) which describes all possible scancodes which can be sent by the keyboard (hardware/driver). Also, after all keycode definitions, the list may contain a set of aliases – alternative names for already defined keycodes.

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

B.3.1.2 Modifiers

The list of modifiers includes only their names, for future reference.

B.3.1.3 Key types

The list of the key types (identified by names) includes full definition of each type:

- number of shift levels
- mapping between modifiers and shift levels

Each element of the type mapping includes a set of modifiers (empty set is allowed) and the shift level to be used when the combination of modifiers is present in the keyboard state.

B.3.1.4 Interpretation rules

The most complex dictionary is the list of interpretation rules.

Each rule has “left” and “right” components. “Left” component defines the condition which activates the rule, the “right” component is the proposed action to be performed – change of the state.

The rule condition is expected to include the key symbol (from the list of key symbols specified by ISO) and some set on modifiers (each modifier can be combined with any of quantifier “any/all/none/exactly”).

The change of the state, activated by the rule, can be either change of group (relative or absolute) or change of modifiers. This change have different scope – the state is used as either “latched” or “locked” or “base”.

B.3.2 Meta-information

The meta-information provides the information which does not describe the keyboard as such – it provide the geographical, linguistic, etc. context.

At the moment, only list of countries (ISO 3166 3-letter codes) and languages (ISO 639 2-letter codes) are defined. Any other properties (vendor-specific) can be put into the list of custom properties.

B.3.3 Non-functional information

The non-functional information describes the keyboard features not related to the functioning. The only feature of that kind is the keyboard geometry. The geometry is described as SVG (Scalable Vector Graphics) element embedded into the keyboard description.

B.3.4 Functional information

The functional information section specifies the actual functionality of the keyboard – the way keyboard processes keypresses.

B.3.4.1 List of groups

The first subsection of the functional information contains the list of groups recommended by the keyboard manufacturer. This list can be used by an operating system, or drivers, or applications for preparing the actual configuration. Each element of the list is a group name1. The order of groups in the list is the order to be used further in the functional section.

B.3.4.2 List of keys

The list of keys comprises the largest subsection of the functional information.

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Each key is defined by its scancode (numeric) and keycode (character string). The keycode refers to the keycode dictionary (see above). While the scancode is unchangeable, the keycode can be changed by an operating system or a keyboard driver.

A key can optionally have one raster image (in one of the raster formats, converted to ASCII using base64 encoding) representing the engraving on the key. It can for example be a vendor logo or any other symbol.

Every key corresponds to one of the types (specified in the dictionary). Also, keypress may generate a sequence made out of universal character set symbols (in UTF-8 encoding) – depending on the current group and shift level. This information is a recommendation for the keyboard configuration.

B.3.4.3 List of indicators

The last part of the functional section is the list of indicators.

Each indicator has a name represents optional combinations of groups or modifiers (when that combination is active, the indicator is turned on).

B.4 A specification in RELAX NG language of the keyboard description format

```
default namespace = "http://www.iso.org/WG1"
namespace a = "http://relaxng.org/ns/compatibility/annotations/1.0"

# A reference to a set if modifiers
setOfModifiers =
  element modifier {
    attribute name { xsd:string },
    empty
  }+
# Some actions affect either group or
# modifiers
stateChangeAction =
  (# Group management.
   # "relative" attribute
   # indicates whether
   # the value should be
   # treated as absolute or
   # added/removed to the
   # current value
   attribute type { "group" },
   attribute relative { xsd:boolean },
   xsd:integer)
  | (# The list of modifiers to
     # set/latch/lock
     attribute type { "modifiers" },
     setOfModifiers)
# How indicators use groups or modifiers
indicatorUse =
  element use {
    attribute which {
      "base" | "compat" | "effective" | "latched" | "locked"
    },
    empty
  }+
customProperties =
  # Any other stuff - custom properties, if necessary.
  # Can be used in drivers or vendor-specific apps.
  element customProperty {
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    attribute name { xsd:string },
    xsd:string
  }*
start =
  element keyboard {
    # First, all the dictionaries we use in the definitions
    element dictionaries {
      # The list of keycodes.
      # The default list of them should be provided separately
      element keycodes {
        # Each keycode is represented by the string id
        # and numeric value
        element keycode {
          (attribute id { xsd:string }
           & attribute value { xsd:int }),
          empty
        }+,
        # The List of aliases
        element alias {
          (attribute id { xsd:string }
           & attribute ref { xsd:string }),
          empty
        }*
      },
      # The list of modifiers used in the definition
      element modifiers {
        # Each modifier has nothing but name
        element modifier {
          attribute name { xsd:string },
          empty
        }*
      },
      # Keyboard types
      element types {
        element type {
          (# Each type has a name
           attribute name { xsd:string }
           & # Number of levels for a type
             attribute numLevels { xsd:int }),
          # Map: (modifiers)->level
          element map {
            element mapEntry {
              attribute level { xsd:int },
              # Set of modifiers (can be empty)
              # Should refer the elements from the modifiers dictionary
              element modifier {
                attribute name { xsd:string },
                empty
              }*
            }*
          }
        }*
      },
      # Interpretation rules
      element interpretation {
        element rule {
          # Each rule has a condition of execution
          element condition {
            # Which keycode this rule is for
            element keysym {
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
          attribute id { xsd:string },
          empty
        },
        # The modifiers list (for the predicate attribute).
        element modifiersList {
          attribute predicate {
            "all" | "any" | "exactly" | "none"
          }?,
          element modifier {
            attribute name { xsd:string },
            empty
          }+
        }?
      },
      # When the rule condition is met - what the system has to do
      element action {
        # The action is either of ...
        element latch { stateChangeAction }
        | element lock { stateChangeAction }
        | element set { stateChangeAction }
      }
    }*
  }
},
# Meta-information - describes the keyboard purpose
element meta {
  # List of countries, can be empty. ISO 3166
  element countriesList {
    element country { xsd:string }*
  },
  # List of languages, can be empty. ISO 639
  element languagesList {
    element language { xsd:string }*
  },
  customProperties
},
element nonFunctional {
  element geometry { external "Tiny-1.2.rnc" }
},
element functional {
  element groupList {
    element group {
      attribute name { xsd:string }
    }+
  },
  # The list of the keys on the keyboard
  element keyList {
    element key {
      (# Physical scancode
       attribute scancode { xsd:int }
       & # One keycode per key -
         # see the keycodes dictionary above
         attribute keycode { xsd:string }),
      # Meta-information about the key (optional)
      element meta {
        # Engraving (bitmap image)
        element engraving {
          attribute format { "png" | "gif" | "bmp" },
          xsd:base64Binary
        }?,
```

© ISO/IEC 2008 All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
          customProperties
        }?,
        # Each key can have 0 - N groups
        element group {
          # For each group, a key has a type
          attribute type { xsd:string },
          # Within each group, there can be multiple shift levels
          # On each shift level, we can have either one symbol
          # or a sequence
          element shiftLevel {
            element symbol { xsd:string }+
          }+
        }*
      }+
    },
    # The list of indicators
    element indicatorsList {
      element indicator {
        # Each real indicator should have a name
        attribute name { xsd:string },
        element groups {
          indicatorUse
          # Which groups are reflected by this indicator

        }?,
        element modifiers {
          indicatorUse,
          # Which modifiers are reflected by this indicator
          setOfModifiers
        }?
      }+
    }
  }
}
```

B.5 A description in EBNF language of the keyboard format

B.5.1 Rules for BNF syntax

In the following a description of the Relax NG definition is given in the form of a Backus-Naur description format.

The syntax used here is near to ISO/IEC 14977, but "_" is allowed in identifiers, and comma is not used as concatenator, as the items are just concatenated. Definitions between <angle brackets> make use of terms not defined in this BNF syntax, and assume general

English usage.

Other conventions:

* means 0 or more repetitions of a token.
+ means one or more repetitions of a token
Brackets [ ] indicate optional occurrence of a token.
Comments start with a % on a separate line.

There may be more specifications in the normative text that describes restrictions on the grammar.

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

B.5.2 Grammar for ISO/IEC 24757 Relax NG descriptions

```
% Overall relax NG structure
iso24757rng         = xml_decl keyb_decl

xml_decl            = '<?xml version="1.0" encoding="UTF-8"?>'
keyb_decl           = HEAD 'keyboard' BR keyb_body TAIL 'keyboard' BR
keyb_params         = SP+ 'xmlns="http://www.iso.org/jtc1/sc35/wg1/iso24757"'

keyb_body           = [ dictionaries ] [ meta ] [ nonfunctional ] [ functional ]
dictionaries        = HEAD 'dictionaries' BR dict_elem* TAIL 'dictionaries' BR
meta                = HEAD 'meta' BR meta_elem* TAIL 'meta' BR
nonfunctional       = HEAD 'nonfunctional' BR nonf_elem* TAIL 'nonfunctional' BR
functional          = HEAD 'functional' BR func_elem* TAIL 'functional' BR

% dictionaries section
dict_elem           = keycodes | modifiers | types | interpretation
keycodes            = HEAD 'keycodes' BR [ keycode | alias ] * TAIL 'keycodes' BR
keycode             = HEAD 'keycode' SP+ 'id=' string 'value= string HEADTAIL
alias               = HEAD 'alias' SP+ 'id=' string 'ref= string HEADTAIL
modifiers           = HEAD 'modifiers' BR modifier* TAIL 'modifiers' BR
modifier            = HEAD 'modifier' SP+ 'name=' string HEADTAIL
types               = HEAD 'types' BR type* TAIL 'types' BR
type                = HEAD 'type' SP+ 'name=' string 'numLevels=' string BR
                      map* TAIL 'type> BR
map                 = HEAD 'map' BR mapentry* TAIL 'map' BR
mapentry            = HEAD 'mapEntry' BR mapmodifier* TAIL 'mapEntry' BR
mapmodifier         = HEAD 'modifier' SP+ 'name=' string HEADTAIL
interpretation      = HEAD 'interpretation' BR rule* TAIL 'interpretation' BR
rule                = HEAD 'rule' BR condition action TAIL 'rule' BR
condition            = HEAD 'condition' BR keysym modifierslist TAIL 'condition'
BR
keysym              = HEAD 'keysym' SP+ 'id=' string HEADTAIL
modifierslist       = HEAD 'modifiersList' SP+ 'predicate=' string BR modifier*
                      TAIL 'modifiersList' BR
action              = HEAD 'action' BR lock | latch | set TAIL 'action' BR
lock                = HEAD 'lock' SP+ 'type=' string [ 'relative=' string ] BR
                      [ '-1' | '0' | '1' | modifier* ] TAIL 'lock' BR
latch                = HEAD 'latch' SP+ 'type=' string BR modifier* TAIL 'latch'
BR
set                 = HEAD 'set' SP+ 'type=' string ['relative= string] BR
                      [ '-1' | '0' | '1' | modifier* ] TAIL 'set' BR


% meta section
meta_elem           = countrieslist | languageslist
countrieslist       = HEAD 'countriesList' BR country* TAIL 'countriesList' BR
country             = HEAD 'country' SP+ BR <countryname> TAIL 'country' BR
languageslist       = HEAD 'languagesList' BR country* TAIL 'languagesList' BR
language            = HEAD 'language' SP+ BR <languagename> TAIL 'language' BR

% nonfunctional section
nonf_elem           = geometry
geometry            = HEAD 'geometry' BR svg TAIL 'geometry' BR
defs                = HEAD 'defs' BR lineargradient TAIL 'defs' BR
lineargradient      = HEAD 'linearGradient' SP+ 'id=' string BR stop*
                      TAIL 'linearGradient' BR
stop                    = HEAD 'stop' SP+ 'offset=' string 'stop-color=' string
HEADTAIL
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
svg                    = HEAD 'svg' SP+ xmlns BR defs | rect | circle | g1 TAIL
'svg' BR
rect                 = HEAD 'rect SP+ 'width=' string 'height=' string 'x=' string
                       'y=' string 'rx=' string 'ry=' string 'fill=' string
                       'stroke=' string HEADTAIL
circle                  = HEAD 'circle SP+ 'cx=' string 'cy=' string 'r=' string
HEADTAIL
g1                   = HEAD 'g' SP+ 'transform=' string BR g2 TAIL 'g' BR
g2                   = HEAD 'g' SP+ 'id=' string BR [ rect | circle ]* TAIL 'g' BR

% functional section
func_elem            = groupList keyList indicatorsList
groupList            = HEAD 'groupList' BR funcgroup* TAIL 'groupList' BR
funcgroup            = HEAD 'group' SP+ 'name=' string HEADTAIL
keyList              = HEAD 'keyList' BR key* TAIL 'keyList' BR
group                = HEAD 'group' SP+ 'type=' string BR shift TAIL 'group' BR
shift                = symbol | HEAD 'shiftlevel' BR symbol TAIL 'shiftLevel' BR
symbol               = HEAD 'symbol' BR <character>+ TAIL 'symbol' BR
key                  = HEAD 'key' SP+ 'keycode=' string 'scancode=' string BR
                       keygroup TAIL 'key' BR
keygroup              = HEAD 'group' SP+ 'type=' string BR keysymbol TAIL 'group'
BR
keysymbol            = HEAD 'symbol' BR <character>+ TAIL 'symbol' BR
indicatorsList        = HEAD 'indicatorsList' BR indicator* TAIL 'indicatorsList'
BR
indicator            = HEAD 'indicator' SP+ 'name=' string BR ind_modifiers
                       TAIL 'indicator' BR
indmodifiers         = HEAD 'modifiers' BR use indmodifier TAIL 'modifiers' BR
use                  = HEAD 'use' SP+ 'which=' string HEADTAIL
indmodifier          = HEAD 'modifier' SP+ 'name=' string HEADTAIL

% syntax parsing
comment              = '<!--' <character>* '-->'
string               = SP* '"' <character>* '"' SP*
HEAD                 = '<' SP*
TAIL                 = '<' SP* '/' SP*
HEADTAIL             = SP* '/ SP* '>'
BR                   = SP* '>'
SP                   = ' ' | <EOL> | <TAB> | comment
```

B.6 An example keyboard description

```
<?xml version="1.0" encoding="UTF-8"?>
<keyboard xmlns="http://www.iso.org/jtc1/sc35/wg1/iso24757">
   <dictionaries>
      <keycodes>
         <keycode id="aa" value="1"/>
         <keycode id="bb" value="2"/>
         <keycode id="cc" value="3"/>
      </keycodes>
      <modifiers>

      </modifiers>
      <types>
      </types>
      <interpretation>

      </interpretation>
   </dictionaries>
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    <meta>
       <countries/>
       <languages/>
    </meta>
    <nonFunctional>
       <geometry>
          <ns:svg xmlns:ns="http://www.w3.org/2000/svg">
             <ns:circle cx="10" cy="10" r="10"/>
          </ns:svg>
       </geometry>
    </nonFunctional>
    <functional>
       <groupList>
          <group name="US"/>
          <group name="Russian"/>
       </groupList>
       <keyList>
          <key keycode="A" scancode="11">
                <group type="TWO_LEVEL">
                   <symbol>a</symbol><symbol>A</symbol>
                </group>
          </key>
          <key keycode="B" scancode="11">
                <group type="TWO_LEVEL">
                   <symbol>b</symbol><symbol>B</symbol>
                </group>
          </key>
          <key keycode="C" scancode="11">
                <group type="TWO_LEVEL">
                   <symbol>c</symbol><symbol>C</symbol>
                </group>
          </key>
       </keyList>
       <indicatorsList>
          <indicator name="Caps Lock"/>
       </indicatorsList>
    </functional>
</keyboard>
```

B.7 Format in XML syntax

The format described in this annex can also be expressed in XML, as follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
           elementFormDefault="qualified"
           targetNamespace="http://www.iso.org/jtc1/sc35/wg1/iso24757"
           xmlns:iso24757="http://www.iso.org/jtc1/sc35/wg1/iso24757"
           xmlns:svg="http://www.w3.org/2000/svg">

  <!-- SVG namespace is external -->
  <import namespace="http://www.w3.org/2000/svg"/>

  <!-- A reference to a set if modifiers -->
  <xs:group name="setOfModifiers">
    <xs:sequence>
      <xs:element maxOccurs="unbounded" ref="iso24757:modifier"/>
    </xs:sequence>
  </xs:group>
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
  <xs:element name="modifier">
    <xs:complexType>
      <xs:attribute name="name" use="required" type="xs:string"/>
    </xs:complexType>
  </xs:element>
  <!--
    Some actions affect either group or
    modifiers
  -->
  <xs:complexType name="stateChangeAction" mixed="true">
    <xs:group minOccurs="0" ref="iso24757:setOfModifiers"/>
    <xs:attribute name="type" use="required">
      <xs:simpleType>
        <xs:restriction base="xs:token">
          <xs:enumeration value="group"/>
          <xs:enumeration value="modifiers"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="relative" type="xs:boolean"/>
  </xs:complexType>
  <!-- How indicators use groups or modifiers -->
  <xs:complexType name="indicatorUse">
    <xs:sequence>
      <xs:element maxOccurs="unbounded" ref="iso24757:use"/>
    </xs:sequence>
  </xs:complexType>
  <xs:element name="use">
    <xs:complexType>
      <xs:attribute name="which" use="required">
        <xs:simpleType>
          <xs:restriction base="xs:token">
            <xs:enumeration value="base"/>
            <xs:enumeration value="compat"/>
            <xs:enumeration value="effective"/>
            <xs:enumeration value="latched"/>
            <xs:enumeration value="locked"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
    </xs:complexType>
  </xs:element>
  <xs:group name="customProperties">
    <xs:sequence>
      <xs:element               minOccurs="0"               maxOccurs="unbounded"
ref="iso24757:customProperty"/>
    </xs:sequence>
  </xs:group>
  <xs:element name="customProperty">
    <xs:complexType>
      <xs:simpleContent>
        <xs:extension base="xs:string">
          <xs:attribute name="name" use="required" type="xs:string"/>
        </xs:extension>
      </xs:simpleContent>
    </xs:complexType>
  </xs:element>
  <xs:element name="keyboard">
    <xs:complexType>
      <xs:sequence>
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        <xs:element ref="iso24757:dictionaries"/>
        <xs:element name="meta">
          <xs:complexType>
            <xs:sequence>
              <xs:element ref="iso24757:countriesList"/>
              <xs:element ref="iso24757:languagesList"/>
              <xs:group ref="iso24757:customProperties"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element ref="iso24757:nonFunctional"/>
        <xs:element ref="iso24757:functional"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="dictionaries">
    <xs:complexType>
      <xs:sequence>
        <xs:element ref="iso24757:keycodes"/>
        <xs:element name="modifiers">
          <xs:complexType>
            <xs:sequence>
              <xs:element          minOccurs="0"          maxOccurs="unbounded"
ref="iso24757:modifier"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element ref="iso24757:types"/>
        <xs:element ref="iso24757:interpretation"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="keycodes">
    <xs:complexType>
      <xs:sequence>
        <xs:element maxOccurs="unbounded" ref="iso24757:keycode"/>
        <xs:element minOccurs="0" maxOccurs="unbounded" ref="iso24757:alias"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="keycode">
    <xs:complexType>
      <xs:attribute name="id" use="required" type="xs:string"/>
      <xs:attribute name="value" use="required" type="xs:int"/>
    </xs:complexType>
  </xs:element>
  <xs:element name="alias">
    <xs:complexType>
      <xs:attribute name="id" use="required" type="xs:string"/>
      <xs:attribute name="ref" use="required" type="xs:string"/>
    </xs:complexType>
  </xs:element>
  <xs:element name="types">
    <xs:complexType>
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="unbounded" ref="iso24757:type"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="type">
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    <xs:complexType>
      <xs:sequence>
        <xs:element ref="iso24757:map"/>
      </xs:sequence>
      <xs:attribute name="name" use="required" type="xs:string"/>
      <xs:attribute name="numLevels" use="required" type="xs:int"/>
    </xs:complexType>
  </xs:element>
  <xs:element name="map">
    <xs:complexType>
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="unbounded" ref="iso24757:mapEntry"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="mapEntry">
    <xs:complexType>
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="unbounded" ref="iso24757:modifier"/>
      </xs:sequence>
      <xs:attribute name="level" use="required" type="xs:int"/>
    </xs:complexType>
  </xs:element>
  <xs:element name="interpretation">
    <xs:complexType>
      <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="unbounded" ref="iso24757:rule"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="rule">
    <xs:complexType>
      <xs:sequence>
        <xs:element ref="iso24757:condition"/>
        <xs:element ref="iso24757:action"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="condition">
    <xs:complexType>
      <xs:sequence>
        <xs:element ref="iso24757:keysym"/>
        <xs:element minOccurs="0" ref="iso24757:modifiersList"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="keysym">
    <xs:complexType>
      <xs:attribute name="id" use="required" type="xs:string"/>
    </xs:complexType>
  </xs:element>
  <xs:element name="modifiersList">
    <xs:complexType>
      <xs:sequence>
        <xs:element maxOccurs="unbounded" ref="iso24757:modifier"/>
      </xs:sequence>
      <xs:attribute name="predicate">
        <xs:simpleType>
          <xs:restriction base="xs:token">
            <xs:enumeration value="all"/>
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
          <xs:enumeration value="any"/>
          <xs:enumeration value="exactly"/>
          <xs:enumeration value="none"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
  </xs:complexType>
</xs:element>
<xs:element name="action">
  <xs:complexType>
    <xs:choice>
      <xs:element ref="iso24757:latch"/>
      <xs:element ref="iso24757:lock"/>
      <xs:element ref="iso24757:set"/>
    </xs:choice>
  </xs:complexType>
</xs:element>
<xs:element name="latch" type="iso24757:stateChangeAction"/>
<xs:element name="lock" type="iso24757:stateChangeAction"/>
<xs:element name="set" type="iso24757:stateChangeAction"/>
<xs:element name="countriesList">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="unbounded" ref="iso24757:country"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="country" type="xs:string"/>
<xs:element name="languagesList">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="unbounded" ref="iso24757:language"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="language" type="xs:string"/>
<xs:element name="nonFunctional">
  <xs:complexType>
    <xs:sequence>
      <xs:element ref="iso24757:geometry"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="geometry">
  <xs:complexType>
    <xs:sequence>
      <xs:element ref="svg:svg"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="functional">
  <xs:complexType>
    <xs:sequence>
      <xs:element ref="iso24757:groupList"/>
      <xs:element ref="iso24757:keyList"/>
      <xs:element ref="iso24757:indicatorsList"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="groupList">
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    <xs:complexType>
      <xs:sequence>
        <xs:element maxOccurs="unbounded" name="group">
          <xs:complexType>
            <xs:attribute name="name" use="required" type="xs:string"/>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="keyList">
    <xs:complexType>
      <xs:sequence>
        <xs:element maxOccurs="unbounded" ref="iso24757:key"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="key">
    <xs:complexType>
      <xs:sequence>
        <xs:element minOccurs="0" name="meta">
          <xs:complexType>
            <xs:sequence>
              <xs:element minOccurs="0" ref="iso24757:engraving"/>
              <xs:group ref="iso24757:customProperties"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element minOccurs="0" maxOccurs="unbounded" name="group">
          <xs:complexType>
            <xs:sequence>
              <xs:element maxOccurs="unbounded" ref="iso24757:shiftLevel"/>
            </xs:sequence>
            <xs:attribute name="type" use="required" type="xs:string"/>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
      <xs:attribute name="scancode" use="required" type="xs:int"/>
      <xs:attribute name="keycode" use="required" type="xs:string"/>
    </xs:complexType>
  </xs:element>
  <xs:element name="engraving">
    <xs:complexType>
      <xs:simpleContent>
        <xs:extension base="xs:base64Binary">
          <xs:attribute name="format" use="required">
            <xs:simpleType>
              <xs:restriction base="xs:token">
                <xs:enumeration value="png"/>
                <xs:enumeration value="gif"/>
                <xs:enumeration value="bmp"/>
              </xs:restriction>
            </xs:simpleType>
          </xs:attribute>
        </xs:extension>
      </xs:simpleContent>
    </xs:complexType>
  </xs:element>
  <xs:element name="shiftLevel">
    <xs:complexType>
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
      <xs:sequence>
        <xs:element maxOccurs="unbounded" ref="iso24757:symbol"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="symbol" type="xs:string"/>
  <xs:element name="indicatorsList">
    <xs:complexType>
      <xs:sequence>
        <xs:element maxOccurs="unbounded" ref="iso24757:indicator"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="indicator">
    <xs:complexType>
      <xs:sequence>
        <xs:element minOccurs="0" ref="iso24757:groups"/>
        <xs:element minOccurs="0" name="modifiers">
          <xs:complexType>
            <xs:complexContent>
              <xs:extension base="iso24757:indicatorUse">
                <xs:group ref="iso24757:setOfModifiers"/>
              </xs:extension>
            </xs:complexContent>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
      <xs:attribute name="name" use="required" type="xs:string"/>
    </xs:complexType>
  </xs:element>
  <xs:element name="groups" type="iso24757:indicatorUse"/>
</xs:schema>
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Annex C
(informative)

Brief History of computer keyboards and their associated software

The technical evolution of the interface of PC keyboards have been through a number of phases, including the following stages: 1, the original IBM PC, 2, the AT and PS/2 keyboards, and 3: the USB interface. In the following a description of the technical facilities of each of these phases of the interface is presented.

C.1 The IBM keyboard

The IBM keyboard was introduced with the IBM PC in 1981. Of course a number of computer keyboards have existed before that time.

There was a small CPU imbedded in the keyboard, which controlled the keys and the sending of codes to the computer. The codes were the so-called scancodes, a value between 1 and 127. In addition a state code was submitted for every key punched, namely a “push” code when the key was pressed, and a “release” code when the key was released. The CPU was also responsible for generating repeated scancodes, when a key was pressed for a longer time. The state (push or release) was using one bit in front of the one-octet scan code being sent to the computer.

The keyboard could not receive any information from the computer.

The interface between the computer and the keyboard were either a 9 pin DB9 serial interface, or a bigger 5 pin round keyboard plug. Both conformed to the V.24 interface, and there were mechanical converter cables and plugs to convert one plug to another, which only were electrical connections of corresponding pins. The interface speed was typically 9600 bits per second.

The physical layout of the IBM PC keyboard was with a row of 10 function keys at the left side, then a main section with a varying number of keys, depending on the market (country, language) to be covered. The original PC had a single editing and numeric section, and the way to switch between each other was through the NumLock key. There were no function or special keys in the top of the keyboard.

C.2 The AT and PS/2 keyboard

The IBM PC AT keyboard was much alike the IBM PC keyboard. It also sent keyscan and action codes to the computer.

The keyboard cpu could also get an order from the computer to turn on the status of 3 lock controls, namely numeric lock (Num Lock), Caps Lock, and Scroll Lock. This also turned on a light on the keyboard for the corresponding key could be lit or turned off.

The AT Keyboard layout was equivalent to the IBM PC keyboard, with 10 function keys on the left side. A new design was introduced with the PS/2 and RT enhanced keyboards, where the 10 function keys to the left were moved to the top of the keyboard, and there were now 2 more keys (in total 12 function keys). Furthermore an independent editing section was available while the numeric section preserved its compatibility with the first PC (toggling from an editing section to a numeric keybad was still possible through the use of the NumLock key).

The scan codes and the state codes were the transmitted on two octets rather than one octet containing both.

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

The PS/2 keyboard plug was a smaller round PS/2 plug with 6 pins. This was not electrically compatible with the DB9 interface and the bigger IBM PC round 5-pin plug. The PS/2 plug was often coloured blue, and was often flat or otherwise marked on the top side. Passive converter cables between the different newer plug formats existed and were common.

C.3 The USB keyboard

The USB keyboard introduced a new generation of electronics for this unit. The physical layout of the keyboard was similar to the PS/2 keyboard, with minimal modifications, but what was sent from the keyboard to the computer was different. The key code values could now be well above 127. Also more information about the keyboard could be obtained via the USB interface. In many cases the keyboard implemented both USB and PS/2 interfaces, and there exists passive mechanical plug converters between the USB and the PS/2 interfaces.

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Annex D
(informative)

Format Mapping

D.1 General

This Annex surveys descriptions of machine parsable keyboard description formats, that are used in different operating systems.

For each description format, first an overview of the format is given, then an example description is given, then a formal description in BNF is given and lastly a mapping between the format defined in this international standard and the industry standard description format is given. The information tries to be complete, but there may be errors in the description.

D.2 Unix/Linux X Window xkb keyboard format

The xkb format is part of the X Window graphical system.

D.2.1 xkb description

The X keyboard is described via APIs in http://www.xfree86.org/current/XKBlib.pdf .

D.2.2 xkb example

This example is a demonstration example, that is actually not a production specification, but produced for this International Standard. It is believed that the example demonstrates all uses of xkb facilities.

```
xkb_keymap {
xkb_keycodes "xfree86+aliases(qwerty)" {
    minimum = 8;
    maximum = 255;
     <ESC> = 9;
    <AE01> = 10;
    <AE02> = 11;
    <AE03> = 12;
    <AE04> = 13;
    <AE05> = 14;
    <AE06> = 15;
    <AE07> = 16;
    <AE08> = 17;
    <AE09> = 18;
    <AE10> = 19;
    <AE11> = 20;
    <AE12> = 21;
    <BKSP> = 22;
     <TAB> = 23;
    <AD01> = 24;
    <AD02> = 25;
    <AD03> = 26;
    <AD04> = 27;
    <AD05> = 28;
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
<AD06> = 29;
<AD07> = 30;
<AD08> = 31;
<AD09> = 32;
<AD10> = 33;
<AD11> = 34;
<AD12> = 35;
<RTRN> = 36;
<LCTL> = 37;
<AC01> = 38;
<AC02> = 39;
<AC03> = 40;
<AC04> = 41;
<AC05> = 42;
<AC06> = 43;
<AC07> = 44;
<AC08> = 45;
<AC09> = 46;
<AC10> = 47;
<AC11> = 48;
<TLDE> = 49;
<LFSH> = 50;
<BKSL> = 51;
<AB01> = 52;
<AB02> = 53;
<AB03> = 54;
<AB04> = 55;
<AB05> = 56;
<AB06> = 57;
<AB07> = 58;
<AB08> = 59;
<AB09> = 60;
<AB10> = 61;
<RTSH> = 62;
<KPMU> = 63;
<LALT> = 64;
<SPCE> = 65;
<CAPS> = 66;
<FK01> = 67;
<FK02> = 68;
<FK03> = 69;
<FK04> = 70;
<FK05> = 71;
<FK06> = 72;
<FK07> = 73;
<FK08> = 74;
<FK09> = 75;
<FK10> = 76;
<NMLK> = 77;
<SCLK> = 78;
 <KP7> = 79;
 <KP8> = 80;
 <KP9> = 81;
<KPSU> = 82;
 <KP4> = 83;
 <KP5> = 84;
 <KP6> = 85;
<KPAD> = 86;
 <KP1> = 87;
 <KP2> = 88;
 <KP3> = 89;
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
 <KP0> = 90;
<KPDL> = 91;
<SYRQ> = 92;
<MDSW> = 93;
<LSGT> = 94;
<FK11> = 95;
<FK12> = 96;
<HOME> = 97;
  <UP> = 98;
<PGUP> = 99;
<LEFT> = 100;
<RGHT> = 102;
 <END> = 103;
<DOWN> = 104;
<PGDN> = 105;
 <INS> = 106;
<DELE> = 107;
<KPEN> = 108;
<RCTL> = 109;
<PAUS> = 110;
<PRSC> = 111;
<KPDV> = 112;
<RALT> = 113;
 <BRK> = 114;
<LWIN> = 115;
<RWIN> = 116;
<MENU> = 117;
<FK13> = 118;
<FK14> = 119;
<FK15> = 120;
<FK16> = 121;
<FK17> = 122;
<KPDC> = 123;
<LVL3> = 124;
 <ALT> = 125;
<KPEQ> = 126;
<SUPR> = 127;
<HYPR> = 128;
<XFER> = 129;
 <I02> = 130;
<NFER> = 131;
 <I04> = 132;
<AE13> = 133;
 <I06> = 134;
 <I07> = 135;
 <I08> = 136;
 <I09> = 137;
 <I0A> = 138;
 <I0B> = 139;
 <I0C> = 140;
 <I0D> = 141;
 <I0E> = 142;
 <I0F> = 143;
 <I10> = 144;
 <I11> = 145;
 <I12> = 146;
 <I13> = 147;
 <I14> = 148;
 <I15> = 149;
 <I16> = 150;
 <I17> = 151;
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
 <I18> = 152;
 <I19> = 153;
 <I1A> = 154;
 <I1B> = 155;
<META> = 156;
 <K59> = 157;
 <I1E> = 158;
 <I1F> = 159;
 <I20> = 160;
 <I21> = 161;
 <I22> = 162;
 <I23> = 163;
 <I24> = 164;
 <I25> = 165;
 <I26> = 166;
 <I27> = 167;
 <I28> = 168;
 <I29> = 169;
 <K5A> = 170;
 <I2B> = 171;
 <I2C> = 172;
 <I2D> = 173;
 <I2E> = 174;
 <I2F> = 175;
 <I30> = 176;
 <I31> = 177;
 <I32> = 178;
 <I33> = 179;
 <I34> = 180;
 <K5B> = 181;
 <K5D> = 182;
 <K5E> = 183;
 <K5F> = 184;
 <I39> = 185;
 <I3A> = 186;
 <I3B> = 187;
 <I3C> = 188;
 <K62> = 189;
 <K63> = 190;
 <K64> = 191;
 <K65> = 192;
 <K66> = 193;
 <I42> = 194;
 <I43> = 195;
 <I44> = 196;
 <I45> = 197;
 <K67> = 198;
 <K68> = 199;
 <K69> = 200;
 <K6A> = 201;
 <I4A> = 202;
 <K6B> = 203;
 <K6C> = 204;
 <K6D> = 205;
 <K6E> = 206;
 <K6F> = 207;
<HKTG> = 208;
 <K71> = 209;
 <K72> = 210;
<AB11> = 211;
 <I54> = 212;
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    <I55> = 213;
    <I56> = 214;
    <I57> = 215;
    <I58> = 216;
    <I59> = 217;
    <I5A> = 218;
    <K74> = 219;
    <K75> = 220;
    <K76> = 221;
    <I5E> = 222;
    <I5F> = 223;
    <I60> = 224;
    <I61> = 225;
    <I62> = 226;
    <I63> = 227;
    <I64> = 228;
    <I65> = 229;
    <I66> = 230;
    <I67> = 231;
    <I68> = 232;
    <I69> = 233;
    <I6A> = 234;
    <I6B> = 235;
    <I6C> = 236;
    <I6D> = 237;
    <I6E> = 238;
    <I6F> = 239;
    <I70> = 240;
    <I71> = 241;
    <I72> = 242;
    <I73> = 243;
    <I74> = 244;
    <I75> = 245;
    <I76> = 246;
    <I77> = 247;
    <I78> = 248;
    <I79> = 249;
    <I7A> = 250;
    <I7B> = 251;
    <I7C> = 252;
    <I7D> = 253;
    <I7E> = 254;
    <I7F> = 255;
  indicator 1 = "Caps Lock";
  indicator 2 = "Num Lock";
  indicator 3 = "Scroll Lock";
  virtual indicator 4 = "Shift Lock";
  virtual indicator 5 = "Group 2";
  virtual indicator 6 = "Mouse Keys";
  alias <HZTG> = <TLDE>;
  alias <HNGL> = <FK16>;
  alias <HJCV> = <FK17>;
  alias  <I01> = <XFER>;
  alias  <I03> = <NFER>;
  alias  <I05> = <AE13>;
  alias  <K5C> = <KPEQ>;
  alias  <K70> = <HKTG>;
  alias  <K73> = <AB11>;
  alias <LMTA> = <LWIN>;
  alias <RMTA> = <RWIN>;
  alias <COMP> = <MENU>;
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    alias <POWR> =  <I0C>;
    alias <MUTE> =  <I0D>;
    alias <VOL-> =  <I0E>;
    alias <VOL+> =  <I0F>;
    alias <HELP> =  <I10>;
    alias <STOP> =  <I11>;
    alias <AGAI> =  <I12>;
    alias <PROP> =  <I13>;
    alias <UNDO> =  <I14>;
    alias <FRNT> =  <I15>;
    alias <COPY> =  <I16>;
    alias <OPEN> =  <I17>;
    alias <PAST> =  <I18>;
    alias <FIND> =  <I19>;
    alias  <CUT> =  <I1A>;
    alias <ALGR> = <RALT>;
    alias <LatQ> = <AD01>;
    alias <LatW> = <AD02>;
    alias <LatE> = <AD03>;
    alias <LatR> = <AD04>;
    alias <LatT> = <AD05>;
    alias <LatY> = <AD06>;
    alias <LatU> = <AD07>;
    alias <LatI> = <AD08>;
    alias <LatO> = <AD09>;
    alias <LatP> = <AD10>;
    alias <LatA> = <AC01>;
    alias <LatS> = <AC02>;
    alias <LatD> = <AC03>;
    alias <LatF> = <AC04>;
    alias <LatG> = <AC05>;
    alias <LatH> = <AC06>;
    alias <LatJ> = <AC07>;
    alias <LatK> = <AC08>;
    alias <LatL> = <AC09>;
    alias <LatZ> = <AB01>;
    alias <LatX> = <AB02>;
    alias <LatC> = <AB03>;
    alias <LatV> = <AB04>;
    alias <LatB> = <AB05>;
    alias <LatN> = <AB06>;
    alias <LatM> = <AB07>;
};

xkb_types "complete" {

    virtual_modifiers
NumLock,Alt,LevelThree,ScrollLock,LevelFive,AltGr,Meta,Super,Hyper;

    type "ONE_LEVEL" {
        modifiers= none;
        level_name[Level1]= "Any";
    };
    type "TWO_LEVEL" {
        modifiers= Shift;
        map[Shift]= Level2;
        level_name[Level1]= "Base";
        level_name[Level2]= "Shift";
    };
    type "ALPHABETIC" {
        modifiers= Shift+Lock;
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        map[Shift]= Level2;
        map[Lock]= Level2;
        level_name[Level1]= "Base";
        level_name[Level2]= "Caps";
    };
    type "KEYPAD" {
        modifiers= Shift+NumLock;
        map[Shift]= Level2;
        map[NumLock]= Level2;
        level_name[Level1]= "Base";
        level_name[Level2]= "Number";
    };
    type "SHIFT+ALT" {
        modifiers= Shift+Alt;
        map[Shift+Alt]= Level2;
        level_name[Level1]= "Base";
        level_name[Level2]= "Shift+Alt";
    };
    type "PC_BREAK" {
        modifiers= Control;
        map[Control]= Level2;
        level_name[Level1]= "Base";
        level_name[Level2]= "Control";
    };
    type "PC_SYSRQ" {
        modifiers= Alt+LevelThree;
        map[Alt]= Level2;
        map[LevelThree]= Level3;
        level_name[Level1]= "Base";
        level_name[Level2]= "Alt";
        level_name[Level3]= "Level3";
    };
    type "CTRL+ALT" {
        modifiers= Control+Alt;
        map[Control+Alt]= Level2;
        level_name[Level1]= "Base";
        level_name[Level2]= "Ctrl+Alt";
    };
    type "THREE_LEVEL" {
        modifiers= Shift+LevelThree;
        map[Shift]= Level2;
        map[LevelThree]= Level3;
        map[Shift+LevelThree]= Level3;
        level_name[Level1]= "Base";
        level_name[Level2]= "Shift";
        level_name[Level3]= "Level3";
    };
    type "EIGHT_LEVEL" {
        modifiers= Shift+LevelThree+LevelFive;
        map[Shift]= Level2;
        map[LevelThree]= Level3;
        map[Shift+LevelThree]= Level4;
        map[LevelFive]= Level5;
        map[Shift+LevelFive]= Level6;
        map[LevelThree+LevelFive]= Level7;
        map[Shift+LevelThree+LevelFive]= Level8;
        level_name[Level1]= "Base";
        level_name[Level2]= "Shift";
        level_name[Level3]= "Alt Base";
        level_name[Level4]= "Shift Alt";
        level_name[Level5]= "X";
```


--`,,```,,,,````-`-`,,`,,`,`,,`---
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale
© ISO/IEC 2008 – All rights reserved

```
    level_name[Level6]= "X Shift";
    level_name[Level7]= "X Alt Base";
    level_name[Level8]= "X Shift Alt";
};
type "EIGHT_LEVEL_ALPHABETIC" {
    modifiers= Shift+Lock+LevelThree+LevelFive;
    map[Shift]= Level2;
    map[Lock]= Level2;
    map[LevelThree]= Level3;
    map[Shift+LevelThree]= Level4;
    map[Lock+LevelThree]= Level4;
    map[Shift+Lock+LevelThree]= Level3;
    map[LevelFive]= Level5;
    map[Shift+LevelFive]= Level6;
    map[Lock+LevelFive]= Level6;
    map[LevelThree+LevelFive]= Level7;
    map[Shift+LevelThree+LevelFive]= Level8;
    map[Lock+LevelThree+LevelFive]= Level8;
    map[Shift+Lock+LevelThree+LevelFive]= Level7;
    level_name[Level1]= "Base";
    level_name[Level2]= "Shift";
    level_name[Level3]= "Alt Base";
    level_name[Level4]= "Shift Alt";
    level_name[Level5]= "X";
    level_name[Level6]= "X Shift";
    level_name[Level7]= "X Alt Base";
    level_name[Level8]= "X Shift Alt";
};
type "EIGHT_LEVEL_SEMIALPHABETIC" {
    modifiers= Shift+Lock+LevelThree+LevelFive;
    map[Shift]= Level2;
    map[Lock]= Level2;
    map[LevelThree]= Level3;
    map[Shift+LevelThree]= Level4;
    map[Lock+LevelThree]= Level3;
    preserve[Lock+LevelThree]= Lock;
    map[Shift+Lock+LevelThree]= Level4;
    preserve[Shift+Lock+LevelThree]= Lock;
    map[LevelFive]= Level5;
    map[Shift+LevelFive]= Level6;
    map[Lock+LevelFive]= Level6;
    preserve[Lock+LevelFive]= Lock;
    map[LevelThree+LevelFive]= Level7;
    map[Shift+LevelThree+LevelFive]= Level8;
    map[Lock+LevelThree+LevelFive]= Level7;
    preserve[Lock+LevelThree+LevelFive]= Lock;
    map[Shift+Lock+LevelThree+LevelFive]= Level8;
    preserve[Shift+Lock+LevelThree+LevelFive]= Lock;
    map[Shift+Lock+LevelFive]= Level1;
    preserve[Shift+Lock+LevelFive]= Lock;
    level_name[Level1]= "Base";
    level_name[Level2]= "Shift";
    level_name[Level3]= "Alt Base";
    level_name[Level4]= "Shift Alt";
    level_name[Level5]= "X";
    level_name[Level6]= "X Shift";
    level_name[Level7]= "X Alt Base";
    level_name[Level8]= "X Shift Alt";
};
type "FOUR_LEVEL" {
    modifiers= Shift+LevelThree;
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        map[Shift]= Level2;
        map[LevelThree]= Level3;
        map[Shift+LevelThree]= Level4;
        level_name[Level1]= "Base";
        level_name[Level2]= "Shift";
        level_name[Level3]= "Alt Base";
        level_name[Level4]= "Shift Alt";
    };
    type "FOUR_LEVEL_ALPHABETIC" {
        modifiers= Shift+Lock+LevelThree;
        map[Shift]= Level2;
        map[Lock]= Level2;
        map[LevelThree]= Level3;
        map[Shift+LevelThree]= Level4;
        map[Lock+LevelThree]= Level4;
        map[Shift+Lock+LevelThree]= Level3;
        level_name[Level1]= "Base";
        level_name[Level2]= "Shift";
        level_name[Level3]= "Alt Base";
        level_name[Level4]= "Shift Alt";
    };
    type "FOUR_LEVEL_SEMIALPHABETIC" {
        modifiers= Shift+Lock+LevelThree;
        map[Shift]= Level2;
        map[Lock]= Level2;
        map[LevelThree]= Level3;
        map[Shift+LevelThree]= Level4;
        map[Lock+LevelThree]= Level3;
        preserve[Lock+LevelThree]= Lock;
        map[Shift+Lock+LevelThree]= Level4;
        preserve[Shift+Lock+LevelThree]= Lock;
        level_name[Level1]= "Base";
        level_name[Level2]= "Shift";
        level_name[Level3]= "Alt Base";
        level_name[Level4]= "Shift Alt";
    };
    type "FOUR_LEVEL_KEYPAD" {
        modifiers= Shift+NumLock+LevelThree;
        map[Shift]= Level2;
        map[NumLock]= Level2;
        map[LevelThree]= Level3;
        map[Shift+LevelThree]= Level4;
        map[NumLock+LevelThree]= Level4;
        map[Shift+NumLock+LevelThree]= Level3;
        level_name[Level1]= "Base";
        level_name[Level2]= "Number";
        level_name[Level3]= "Alt Base";
        level_name[Level4]= "Alt Number";
    };
    type "SEPARATE_CAPS_AND_SHIFT_ALPHABETIC" {
        modifiers= Shift+Lock+LevelThree;
        map[Shift]= Level2;
        map[Lock]= Level4;
        preserve[Lock]= Lock;
        map[LevelThree]= Level3;
        map[Shift+LevelThree]= Level4;
        map[Lock+LevelThree]= Level3;
        preserve[Lock+LevelThree]= Lock;
        map[Shift+Lock+LevelThree]= Level3;
        level_name[Level1]= "Base";
        level_name[Level2]= "Shift";
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        level_name[Level3]= "AltGr Base";
        level_name[Level4]= "Shift AltGr";
    };
};

xkb_compatibility "complete" {

    virtual_modifiers
NumLock,Alt,LevelThree,ScrollLock,LevelFive,AltGr,Meta,Super,Hyper;

    interpret.useModMapMods= AnyLevel;
    interpret.repeat= False;
    interpret.locking= False;
    interpret ISO_Level2_Latch+Exactly(Shift) {
        useModMapMods=level1;
        action= LatchMods(modifiers=Shift,clearLocks,latchToLock);
    };
    interpret Shift_Lock+AnyOf(Shift+Lock) {
        action= LockMods(modifiers=Shift);
    };
    interpret Num_Lock+AnyOf(all) {
        virtualModifier= NumLock;
        action= LockMods(modifiers=NumLock);
    };
    interpret ISO_Lock+AnyOf(all) {
        action= ISOLock(modifiers=modMapMods,affect=all);
    };
    interpret ISO_Level3_Shift+AnyOf(all) {
        virtualModifier= LevelThree;
        useModMapMods=level1;
        action= SetMods(modifiers=LevelThree,clearLocks);
    };
    interpret ISO_Level3_Latch+AnyOf(all) {
        virtualModifier= LevelThree;
        useModMapMods=level1;
        action= LatchMods(modifiers=LevelThree,clearLocks,latchToLock);
    };
    interpret ISO_Level3_Lock+AnyOf(all) {
        virtualModifier= LevelThree;
        useModMapMods=level1;
        action= LockMods(modifiers=LevelThree);
    };
    interpret Alt_L+AnyOf(all) {
        virtualModifier= Alt;
        action= SetMods(modifiers=modMapMods,clearLocks);
    };
    interpret Alt_R+AnyOf(all) {
        virtualModifier= Alt;
        action= SetMods(modifiers=modMapMods,clearLocks);
    };
    interpret Meta_L+AnyOf(all) {
        virtualModifier= Meta;
        action= SetMods(modifiers=modMapMods,clearLocks);
    };
    interpret Meta_R+AnyOf(all) {
        virtualModifier= Meta;
        action= SetMods(modifiers=modMapMods,clearLocks);
    };
    interpret Super_L+AnyOf(all) {
        virtualModifier= Super;
        action= SetMods(modifiers=modMapMods,clearLocks);
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
};
interpret Super_R+AnyOf(all) {
    virtualModifier= Super;
    action= SetMods(modifiers=modMapMods,clearLocks);
};
interpret Hyper_L+AnyOf(all) {
    virtualModifier= Hyper;
    action= SetMods(modifiers=modMapMods,clearLocks);
};
interpret Hyper_R+AnyOf(all) {
    virtualModifier= Hyper;
    action= SetMods(modifiers=modMapMods,clearLocks);
};
interpret Scroll_Lock+AnyOf(all) {
    virtualModifier= ScrollLock;
    action= LockMods(modifiers=modMapMods);
};
interpret F35+AnyOf(all) {
    virtualModifier= LevelFive;
    useModMapMods=level1;
    action= SetMods(modifiers=LevelFive,clearLocks);
};
interpret F34+AnyOf(all) {
    virtualModifier= LevelFive;
    action= LatchMods(modifiers=LevelFive,clearLocks,latchToLock);
};
interpret F33+AnyOf(all) {
    virtualModifier= LevelFive;
    action= LockMods(modifiers=LevelFive);
};
interpret Mode_switch+AnyOfOrNone(all) {
    virtualModifier= AltGr;
    useModMapMods=level1;
    action= SetGroup(group=+1);
};
interpret ISO_Level3_Shift+AnyOfOrNone(all) {
    action= SetMods(modifiers=LevelThree,clearLocks);
};
interpret ISO_Level3_Latch+AnyOfOrNone(all) {
    action= LatchMods(modifiers=LevelThree,clearLocks,latchToLock);
};
interpret ISO_Level3_Lock+AnyOfOrNone(all) {
    action= LockMods(modifiers=LevelThree);
};
interpret ISO_Group_Latch+AnyOfOrNone(all) {
    virtualModifier= AltGr;
    useModMapMods=level1;
    action= LatchGroup(group=2);
};
interpret ISO_Next_Group+AnyOfOrNone(all) {
    virtualModifier= AltGr;
    useModMapMods=level1;
    action= LockGroup(group=+1);
};
interpret ISO_Prev_Group+AnyOfOrNone(all) {
    virtualModifier= AltGr;
    useModMapMods=level1;
    action= LockGroup(group=-1);
};
interpret ISO_First_Group+AnyOfOrNone(all) {
    action= LockGroup(group=1);
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
};
interpret ISO_Last_Group+AnyOfOrNone(all) {
    action= LockGroup(group=2);
};
interpret KP_1+AnyOfOrNone(all) {
    repeat= True;
    action= MovePtr(x=-1,y=+1);
};
interpret KP_End+AnyOfOrNone(all) {
    repeat= True;
    action= MovePtr(x=-1,y=+1);
};
interpret KP_2+AnyOfOrNone(all) {
    repeat= True;
    action= MovePtr(x=+0,y=+1);
};
interpret KP_Down+AnyOfOrNone(all) {
    repeat= True;
    action= MovePtr(x=+0,y=+1);
};
interpret KP_3+AnyOfOrNone(all) {
    repeat= True;
    action= MovePtr(x=+1,y=+1);
};
interpret KP_Next+AnyOfOrNone(all) {
    repeat= True;
    action= MovePtr(x=+1,y=+1);
};
interpret KP_4+AnyOfOrNone(all) {
    repeat= True;
    action= MovePtr(x=-1,y=+0);
};
interpret KP_Left+AnyOfOrNone(all) {
    repeat= True;
    action= MovePtr(x=-1,y=+0);
};
interpret KP_6+AnyOfOrNone(all) {
    repeat= True;
    action= MovePtr(x=+1,y=+0);
};
interpret KP_Right+AnyOfOrNone(all) {
    repeat= True;
    action= MovePtr(x=+1,y=+0);
};
interpret KP_7+AnyOfOrNone(all) {
    repeat= True;
    action= MovePtr(x=-1,y=-1);
};
interpret KP_Home+AnyOfOrNone(all) {
    repeat= True;
    action= MovePtr(x=-1,y=-1);
};
interpret KP_8+AnyOfOrNone(all) {
    repeat= True;
    action= MovePtr(x=+0,y=-1);
};
interpret KP_Up+AnyOfOrNone(all) {
    repeat= True;
    action= MovePtr(x=+0,y=-1);
};
interpret KP_9+AnyOfOrNone(all) {
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        repeat= True;
        action= MovePtr(x=+1,y=-1);
    };
    interpret KP_Prior+AnyOfOrNone(all) {
        repeat= True;
        action= MovePtr(x=+1,y=-1);
    };
    interpret KP_5+AnyOfOrNone(all) {
        repeat= True;
        action= PtrBtn(button=default);
    };
    interpret KP_Begin+AnyOfOrNone(all) {
        repeat= True;
        action= PtrBtn(button=default);
    };
    interpret KP_F2+AnyOfOrNone(all) {
        repeat= True;
        action= SetPtrDflt(affect=button,button=1);
    };
    interpret KP_Divide+AnyOfOrNone(all) {
        repeat= True;
        action= SetPtrDflt(affect=button,button=1);
    };
    interpret KP_F3+AnyOfOrNone(all) {
        repeat= True;
        action= SetPtrDflt(affect=button,button=2);
    };
    interpret KP_Multiply+AnyOfOrNone(all) {
        repeat= True;
        action= SetPtrDflt(affect=button,button=2);
    };
    interpret KP_F4+AnyOfOrNone(all) {
        repeat= True;
        action= SetPtrDflt(affect=button,button=3);
    };
    interpret KP_Subtract+AnyOfOrNone(all) {
        repeat= True;
        action= SetPtrDflt(affect=button,button=3);
    };
    interpret KP_Separator+AnyOfOrNone(all) {
        repeat= True;
        action= PtrBtn(button=default,count=2);
    };
    interpret KP_Add+AnyOfOrNone(all) {
        repeat= True;
        action= PtrBtn(button=default,count=2);
    };
    interpret KP_0+AnyOfOrNone(all) {
        repeat= True;
        action= LockPtrBtn(button=default,affect=lock);
    };
    interpret KP_Insert+AnyOfOrNone(all) {
        repeat= True;
        action= LockPtrBtn(button=default,affect=lock);
    };
    interpret KP_Decimal+AnyOfOrNone(all) {
        repeat= True;
        action= LockPtrBtn(button=default,affect=unlock);
    };
    interpret KP_Delete+AnyOfOrNone(all) {
        repeat= True;
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    action= LockPtrBtn(button=default,affect=unlock);
};
interpret F25+AnyOfOrNone(all) {
    repeat= True;
    action= SetPtrDflt(affect=button,button=1);
};
interpret F26+AnyOfOrNone(all) {
    repeat= True;
    action= SetPtrDflt(affect=button,button=2);
};
interpret F27+AnyOfOrNone(all) {
    repeat= True;
    action= MovePtr(x=-1,y=-1);
};
interpret F29+AnyOfOrNone(all) {
    repeat= True;
    action= MovePtr(x=+1,y=-1);
};
interpret F31+AnyOfOrNone(all) {
    repeat= True;
    action= PtrBtn(button=default);
};
interpret F33+AnyOfOrNone(all) {
    repeat= True;
    action= MovePtr(x=-1,y=+1);
};
interpret F35+AnyOfOrNone(all) {
    repeat= True;
    action= MovePtr(x=+1,y=+1);
};
interpret Pointer_Button_Dflt+AnyOfOrNone(all) {
    action= PtrBtn(button=default);
};
interpret Pointer_Button1+AnyOfOrNone(all) {
    action= PtrBtn(button=1);
};
interpret Pointer_Button2+AnyOfOrNone(all) {
    action= PtrBtn(button=2);
};
interpret Pointer_Button3+AnyOfOrNone(all) {
    action= PtrBtn(button=3);
};
interpret Pointer_DblClick_Dflt+AnyOfOrNone(all) {
    action= PtrBtn(button=default,count=2);
};
interpret Pointer_DblClick1+AnyOfOrNone(all) {
    action= PtrBtn(button=1,count=2);
};
interpret Pointer_DblClick2+AnyOfOrNone(all) {
    action= PtrBtn(button=2,count=2);
};
interpret Pointer_DblClick3+AnyOfOrNone(all) {
    action= PtrBtn(button=3,count=2);
};
interpret Pointer_Drag_Dflt+AnyOfOrNone(all) {
    action= LockPtrBtn(button=default,affect=both);
};
interpret Pointer_Drag1+AnyOfOrNone(all) {
    action= LockPtrBtn(button=1,affect=both);
};
interpret Pointer_Drag2+AnyOfOrNone(all) {
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        action= LockPtrBtn(button=2,affect=both);
    };
    interpret Pointer_Drag3+AnyOfOrNone(all) {
        action= LockPtrBtn(button=3,affect=both);
    };
    interpret Pointer_EnableKeys+AnyOfOrNone(all) {
        action= LockControls(controls=MouseKeys);
    };
    interpret Pointer_Accelerate+AnyOfOrNone(all) {
        action= LockControls(controls=MouseKeysAccel);
    };
    interpret Pointer_DfltBtnNext+AnyOfOrNone(all) {
        action= SetPtrDflt(affect=button,button=+1);
    };
    interpret Pointer_DfltBtnPrev+AnyOfOrNone(all) {
        action= SetPtrDflt(affect=button,button=-1);
    };
    interpret AccessX_Enable+AnyOfOrNone(all) {
        action= LockControls(controls=AccessXKeys);
    };
    interpret AccessX_Feedback_Enable+AnyOfOrNone(all) {
        action= LockControls(controls=AccessXFeedback);
    };
    interpret RepeatKeys_Enable+AnyOfOrNone(all) {
        action= LockControls(controls=RepeatKeys);
    };
    interpret SlowKeys_Enable+AnyOfOrNone(all) {
        action= LockControls(controls=SlowKeys);
    };
    interpret BounceKeys_Enable+AnyOfOrNone(all) {
        action= LockControls(controls=BounceKeys);
    };
    interpret StickyKeys_Enable+AnyOfOrNone(all) {
        action= LockControls(controls=StickyKeys);
    };
    interpret MouseKeys_Enable+AnyOfOrNone(all) {
        action= LockControls(controls=MouseKeys);
    };
    interpret MouseKeys_Accel_Enable+AnyOfOrNone(all) {
        action= LockControls(controls=MouseKeysAccel);
    };
    interpret Overlay1_Enable+AnyOfOrNone(all) {
        action= LockControls(controls=Overlay1);
    };
    interpret Overlay2_Enable+AnyOfOrNone(all) {
        action= LockControls(controls=Overlay2);
    };
    interpret AudibleBell_Enable+AnyOfOrNone(all) {
        action= LockControls(controls=AudibleBell);
    };
    interpret Terminate_Server+AnyOfOrNone(all) {
        action= Terminate();
    };
    interpret Alt_L+AnyOfOrNone(all) {
        action= SetMods(modifiers=Alt,clearLocks);
    };
    interpret Alt_R+AnyOfOrNone(all) {
        action= SetMods(modifiers=Alt,clearLocks);
    };
    interpret Meta_L+AnyOfOrNone(all) {
        action= SetMods(modifiers=Meta,clearLocks);
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
};
interpret Meta_R+AnyOfOrNone(all) {
    action= SetMods(modifiers=Alt,clearLocks);
};
interpret Super_L+AnyOfOrNone(all) {
    action= SetMods(modifiers=Super,clearLocks);
};
interpret Super_R+AnyOfOrNone(all) {
    action= SetMods(modifiers=Super,clearLocks);
};
interpret Hyper_L+AnyOfOrNone(all) {
    action= SetMods(modifiers=Hyper,clearLocks);
};
interpret Hyper_R+AnyOfOrNone(all) {
    action= SetMods(modifiers=Hyper,clearLocks);
};
interpret XF86_Switch_VT_1+AnyOfOrNone(all) {
    repeat= True;
    action= SwitchScreen(screen=1,!same);
};
interpret XF86_Switch_VT_2+AnyOfOrNone(all) {
    repeat= True;
    action= SwitchScreen(screen=2,!same);
};
interpret XF86_Switch_VT_3+AnyOfOrNone(all) {
    repeat= True;
    action= SwitchScreen(screen=3,!same);
};
interpret XF86_Switch_VT_4+AnyOfOrNone(all) {
    repeat= True;
    action= SwitchScreen(screen=4,!same);
};
interpret XF86_Switch_VT_5+AnyOfOrNone(all) {
    repeat= True;
    action= SwitchScreen(screen=5,!same);
};
interpret XF86_Switch_VT_6+AnyOfOrNone(all) {
    repeat= True;
    action= SwitchScreen(screen=6,!same);
};
interpret XF86_Switch_VT_7+AnyOfOrNone(all) {
    repeat= True;
    action= SwitchScreen(screen=7,!same);
};
interpret XF86_Switch_VT_8+AnyOfOrNone(all) {
    repeat= True;
    action= SwitchScreen(screen=8,!same);
};
interpret XF86_Switch_VT_9+AnyOfOrNone(all) {
    repeat= True;
    action= SwitchScreen(screen=9,!same);
};
interpret XF86_Switch_VT_10+AnyOfOrNone(all) {
    repeat= True;
    action= SwitchScreen(screen=10,!same);
};
interpret XF86_Switch_VT_11+AnyOfOrNone(all) {
    repeat= True;
    action= SwitchScreen(screen=11,!same);
};
interpret XF86_Switch_VT_12+AnyOfOrNone(all) {
```

--`,,```,,,,````-`-`,,`,,`,`,,`---
© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        repeat= True;
        action= SwitchScreen(screen=12,!same);
    };
    interpret XF86_Ungrab+AnyOfOrNone(all) {
        repeat= True;
        action=
Private(type=0x86,data[0]=0x55,data[1]=0x6e,data[2]=0x67,data[3]=0x72,data[4]=0x6
1,data[5]=0x62,data[6]=0x00);
    };
    interpret XF86_ClearGrab+AnyOfOrNone(all) {
        repeat= True;
        action=
Private(type=0x86,data[0]=0x43,data[1]=0x6c,data[2]=0x73,data[3]=0x47,data[4]=0x7
2,data[5]=0x62,data[6]=0x00);
    };
    interpret XF86_Next_VMode+AnyOfOrNone(all) {
        repeat= True;
        action=
Private(type=0x86,data[0]=0x2b,data[1]=0x56,data[2]=0x4d,data[3]=0x6f,data[4]=0x6
4,data[5]=0x65,data[6]=0x00);
    };
    interpret XF86_Prev_VMode+AnyOfOrNone(all) {
        repeat= True;
        action=
Private(type=0x86,data[0]=0x2d,data[1]=0x56,data[2]=0x4d,data[3]=0x6f,data[4]=0x6
4,data[5]=0x65,data[6]=0x00);
    };
    interpret F34+AnyOfOrNone(all) {
        action= LatchMods(modifiers=LevelFive,clearLocks,latchToLock);
    };
    interpret Any+Exactly(Lock) {
        action= LockMods(modifiers=Lock);
    };
    interpret Any+AnyOf(all) {
        action= SetMods(modifiers=modMapMods,clearLocks);
    };
    group 2 = AltGr;
    group 3 = AltGr;
    group 4 = AltGr;
    indicator "Caps Lock" {
        !allowExplicit;
        whichModState= locked;
        modifiers= Lock;
    };
    indicator "Num Lock" {
        !allowExplicit;
        whichModState= locked;
        modifiers= NumLock;
    };
    indicator "Scroll Lock" {
        whichModState= locked;
        modifiers= ScrollLock;
    };
    indicator "Shift Lock" {
        !allowExplicit;
        whichModState= locked;
        modifiers= Shift;
    };
    indicator "Group 2" {
        !allowExplicit;
        groups= 0xfe;
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    };
    indicator "Mouse Keys" {
        indicatorDrivesKeyboard;
        controls= mouseKeys;
    };
};

xkb_symbols
"pc(pc105)+us+inet(power_g5)+ru(winkeys):2+group(rctrl_toggle)+eurosign(e)" {

    name[group1]="U.S. English";
    name[group2]="Russia - Winkeys";

    key  <ESC> {         [          Escape ] };
    key <AE01> {         [               1,          exclam ] };
    key <AE02> {
        symbols[Group1]= [               2,              at ],
        symbols[Group2]= [               2,        quotedbl ]
    };
    key <AE03> {
        symbols[Group1]= [               3,      numbersign ],
        symbols[Group2]= [               3,      numerosign ]
    };
    key <AE04> {
        symbols[Group1]= [               4,          dollar ],
        symbols[Group2]= [               4,       semicolon ]
    };
    key <AE05> {         [               5,         percent ] };
    key <AE06> {
        symbols[Group1]= [               6,     asciicircum ],
        symbols[Group2]= [               6,           colon ]
    };
    key <AE07> {
        symbols[Group1]= [               7,       ampersand ],
        symbols[Group2]= [               7,        question ]
    };
    key <AE08> {         [               8,        asterisk ] };
    key <AE09> {         [               9,       parenleft ] };
    key <AE10> {         [               0,      parenright ] };
    key <AE11> {         [           minus,      underscore ] };
    key <AE12> {         [           equal,            plus ] };
    key <BKSP> {
        type= "CTRL+ALT",
        symbols[Group1]= [       BackSpace, Terminate_Server ]
    };
    key  <TAB> {         [             Tab,    ISO_Left_Tab ] };
    key <AD01> {
        type= "ALPHABETIC",
        symbols[Group1]= [               q,               Q ],
        symbols[Group2]= [ Cyrillic_shorti, Cyrillic_SHORTI ]
    };
    key <AD02> {
        type= "ALPHABETIC",
        symbols[Group1]= [               w,               W ],
        symbols[Group2]= [    Cyrillic_tse,    Cyrillic_TSE ]
    };
    key <AD03> {
        type[group1]= "FOUR_LEVEL_SEMIALPHABETIC",
        type[group2]= "ALPHABETIC",
        symbols[Group1]= [               e,               E,        EuroSign,
NoSymbol ],
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    symbols[Group2]= [      Cyrillic_u,      Cyrillic_U ]
};
key <AD04> {
    type= "ALPHABETIC",
    symbols[Group1]= [               r,               R ],
    symbols[Group2]= [     Cyrillic_ka,     Cyrillic_KA ]
};
key <AD05> {
    type= "ALPHABETIC",
    symbols[Group1]= [               t,               T ],
    symbols[Group2]= [     Cyrillic_ie,     Cyrillic_IE ]
};
key <AD06> {
    type= "ALPHABETIC",
    symbols[Group1]= [               y,               Y ],
    symbols[Group2]= [     Cyrillic_en,     Cyrillic_EN ]
};
key <AD07> {
    type= "ALPHABETIC",
    symbols[Group1]= [               u,               U ],
    symbols[Group2]= [    Cyrillic_ghe,    Cyrillic_GHE ]
};
key <AD08> {
    type= "ALPHABETIC",
    symbols[Group1]= [               i,               I ],
    symbols[Group2]= [    Cyrillic_sha,    Cyrillic_SHA ]
};
key <AD09> {
    type= "ALPHABETIC",
    symbols[Group1]= [               o,               O ],
    symbols[Group2]= [  Cyrillic_shcha,  Cyrillic_SHCHA ]
};
key <AD10> {
    type= "ALPHABETIC",
    symbols[Group1]= [               p,               P ],
    symbols[Group2]= [     Cyrillic_ze,     Cyrillic_ZE ]
};
key <AD11> {
    type[group2]= "ALPHABETIC",
    symbols[Group1]= [     bracketleft,       braceleft ],
    symbols[Group2]= [     Cyrillic_ha,     Cyrillic_HA ]
};
key <AD12> {
    type[group2]= "ALPHABETIC",
    symbols[Group1]= [    bracketright,      braceright ],
    symbols[Group2]= [ Cyrillic_hardsign, Cyrillic_HARDSIGN ]
};
key <RTRN> {         [          Return ] };
key <LCTL> {         [       Control_L ] };
key <AC01> {
    type= "ALPHABETIC",
    symbols[Group1]= [               a,               A ],
    symbols[Group2]= [     Cyrillic_ef,     Cyrillic_EF ]
};
key <AC02> {
    type= "ALPHABETIC",
    symbols[Group1]= [               s,               S ],
    symbols[Group2]= [   Cyrillic_yeru,   Cyrillic_YERU ]
};
key <AC03> {
    type= "ALPHABETIC",
```


Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
© ISO/IEC 2008 – All rights reserved
Not for Resale

```
    symbols[Group1]= [              d,              D ],
    symbols[Group2]= [     Cyrillic_ve,     Cyrillic_VE ]
};
key <AC04> {
    type= "ALPHABETIC",
    symbols[Group1]= [              f,              F ],
    symbols[Group2]= [      Cyrillic_a,      Cyrillic_A ]
};
key <AC05> {
    type= "ALPHABETIC",
    symbols[Group1]= [              g,              G ],
    symbols[Group2]= [     Cyrillic_pe,     Cyrillic_PE ]
};
key <AC06> {
    type= "ALPHABETIC",
    symbols[Group1]= [              h,              H ],
    symbols[Group2]= [     Cyrillic_er,     Cyrillic_ER ]
};
key <AC07> {
    type= "ALPHABETIC",
    symbols[Group1]= [              j,              J ],
    symbols[Group2]= [      Cyrillic_o,      Cyrillic_O ]
};
key <AC08> {
    type= "ALPHABETIC",
    symbols[Group1]= [              k,              K ],
    symbols[Group2]= [     Cyrillic_el,     Cyrillic_EL ]
};
key <AC09> {
    type= "ALPHABETIC",
    symbols[Group1]= [              l,              L ],
    symbols[Group2]= [     Cyrillic_de,     Cyrillic_DE ]
};
key <AC10> {
    type[group2]= "ALPHABETIC",
    symbols[Group1]= [       semicolon,          colon ],
    symbols[Group2]= [    Cyrillic_zhe,    Cyrillic_ZHE ]
};
key <AC11> {
    type[group2]= "ALPHABETIC",
    symbols[Group1]= [      apostrophe,        quotedbl ],
    symbols[Group2]= [      Cyrillic_e,      Cyrillic_E ]
};
key <TLDE> {
    type[group2]= "ALPHABETIC",
    symbols[Group1]= [          grave,      asciitilde ],
    symbols[Group2]= [     Cyrillic_io,     Cyrillic_IO ]
};
key <LFSH> {         [         Shift_L ] };
key <BKSL> {
    symbols[Group1]= [       backslash,            bar ],
    symbols[Group2]= [       backslash,          slash ]
};
key <AB01> {
    type= "ALPHABETIC",
    symbols[Group1]= [              z,              Z ],
    symbols[Group2]= [     Cyrillic_ya,     Cyrillic_YA ]
};
key <AB02> {
    type= "ALPHABETIC",
    symbols[Group1]= [              x,              X ],
```

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    symbols[Group2]= [    Cyrillic_che,    Cyrillic_CHE ]
};
key <AB03> {
    type= "ALPHABETIC",
    symbols[Group1]= [               c,               C ],
    symbols[Group2]= [     Cyrillic_es,     Cyrillic_ES ]
};
key <AB04> {
    type= "ALPHABETIC",
    symbols[Group1]= [               v,               V ],
    symbols[Group2]= [     Cyrillic_em,     Cyrillic_EM ]
};
key <AB05> {
    type= "ALPHABETIC",
    symbols[Group1]= [               b,               B ],
    symbols[Group2]= [      Cyrillic_i,      Cyrillic_I ]
};
key <AB06> {
    type= "ALPHABETIC",
    symbols[Group1]= [               n,               N ],
    symbols[Group2]= [     Cyrillic_te,     Cyrillic_TE ]
};
key <AB07> {
    type= "ALPHABETIC",
    symbols[Group1]= [               m,               M ],
    symbols[Group2]= [ Cyrillic_softsign, Cyrillic_SOFTSIGN ]
};
key <AB08> {
    type[group2]= "ALPHABETIC",
    symbols[Group1]= [           comma,           less ],
    symbols[Group2]= [     Cyrillic_be,     Cyrillic_BE ]
};
key <AB09> {
    type[group2]= "ALPHABETIC",
    symbols[Group1]= [          period,         greater ],
    symbols[Group2]= [     Cyrillic_yu,     Cyrillic_YU ]
};
key <AB10> {
    symbols[Group1]= [           slash,        question ],
    symbols[Group2]= [          period,           comma ]
};
key <RTSH> {         [         Shift_R ] };
key <KPMU> {
    type= "CTRL+ALT",
    symbols[Group1]= [     KP_Multiply,  XF86_ClearGrab ]
};
key <LALT> {         [           Alt_L,          Meta_L ] };
key <SPCE> {         [           space ] };
key <CAPS> {         [       Caps_Lock ] };
key <FK01> {
    type= "CTRL+ALT",
    symbols[Group1]= [              F1, XF86_Switch_VT_1 ]
};
key <FK02> {
    type= "CTRL+ALT",
    symbols[Group1]= [              F2, XF86_Switch_VT_2 ]
};
key <FK03> {
    type= "CTRL+ALT",
    symbols[Group1]= [              F3, XF86_Switch_VT_3 ]
};
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    key <FK04> {
        type= "CTRL+ALT",
        symbols[Group1]= [             F4, XF86_Switch_VT_4 ]
    };
    key <FK05> {
        type= "CTRL+ALT",
        symbols[Group1]= [             F5, XF86_Switch_VT_5 ]
    };
    key <FK06> {
        type= "CTRL+ALT",
        symbols[Group1]= [             F6, XF86_Switch_VT_6 ]
    };
    key <FK07> {
        type= "CTRL+ALT",
        symbols[Group1]= [             F7, XF86_Switch_VT_7 ]
    };
    key <FK08> {
        type= "CTRL+ALT",
        symbols[Group1]= [             F8, XF86_Switch_VT_8 ]
    };
    key <FK09> {
        type= "CTRL+ALT",
        symbols[Group1]= [             F9, XF86_Switch_VT_9 ]
    };
    key <FK10> {
        type= "CTRL+ALT",
        symbols[Group1]= [            F10, XF86_Switch_VT_10 ]
    };
    key <NMLK> {         [        Num_Lock, Pointer_EnableKeys ] };
    key <SCLK> {         [     Scroll_Lock ] };
    key  <KP7> {         [         KP_Home,            KP_7 ] };
    key  <KP8> {         [           KP_Up,            KP_8 ] };
    key  <KP9> {         [        KP_Prior,            KP_9 ] };
    key <KPSU> {
        type= "CTRL+ALT",
        symbols[Group1]= [     KP_Subtract, XF86_Prev_VMode ]
    };
    key  <KP4> {         [         KP_Left,            KP_4 ] };
    key  <KP5> {         [        KP_Begin,            KP_5 ] };
    key  <KP6> {         [        KP_Right,            KP_6 ] };
    key <KPAD> {
        type= "CTRL+ALT",
        symbols[Group1]= [          KP_Add, XF86_Next_VMode ]
    };
    key  <KP1> {         [          KP_End,            KP_1 ] };
    key  <KP2> {         [         KP_Down,            KP_2 ] };
    key  <KP3> {         [         KP_Next,            KP_3 ] };
    key  <KP0> {         [       KP_Insert,            KP_0 ] };
    key <KPDL> {
        symbols[Group1]= [       KP_Delete,      KP_Decimal ],
        symbols[Group2]= [       KP_Delete,    KP_Separator ]
    };
    key <MDSW> {         [             F16 ] };
    key <LSGT> {
        type[group1]= "FOUR_LEVEL",
        symbols[Group1]= [            less,         greater,             bar,
brokenbar ],
        symbols[Group2]= [           slash,             bar ]
    };
    key <FK11> {
        type= "CTRL+ALT",
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        symbols[Group1]= [             F11, XF86_Switch_VT_11 ]
    };
    key <FK12> {
        type= "CTRL+ALT",
        symbols[Group1]= [             F12, XF86_Switch_VT_12 ]
    };
    key <HOME> {         [            Home ] };
    key   <UP> {         [              Up ] };
    key <PGUP> {         [           Prior ] };
    key <LEFT> {         [            Left ] };
    key <RGHT> {         [           Right ] };
    key  <END> {         [             End ] };
    key <DOWN> {         [            Down ] };
    key <PGDN> {         [            Next ] };
    key  <INS> {         [          Insert ] };
    key <DELE> {         [          Delete ] };
    key <KPEN> {         [       KP_Enter ] };
    key <RCTL> {         [  ISO_Next_Group ] };
    key <PAUS> {
        type= "PC_BREAK",
        symbols[Group1]= [           Pause,           Break ]
    };
    key <PRSC> {
        type= "PC_SYSRQ",
        symbols[Group1]= [           Print,         Sys_Req,        NoSymbol ]
    };
    key <KPDV> {
        type= "CTRL+ALT",
        symbols[Group1]= [       KP_Divide,     XF86_Ungrab ]
    };
    key <RALT> {         [           Alt_R,          Meta_R ] };
    key <LWIN> {         [         Super_L ] };
    key <RWIN> {         [         Super_R ] };
    key <MENU> {         [            Menu ] };
    key <LVL3> {         [ ISO_Level3_Shift ] };
    key  <ALT> {         [        NoSymbol,           Alt_L ] };
    key <KPEQ> {         [        KP_Equal ] };
    key <SUPR> {         [        NoSymbol,         Super_L ] };
    key <HYPR> {         [        NoSymbol,         Hyper_L ] };
    key <META> {         [        NoSymbol,          Meta_L ] };
    key  <K5D> {         [             F13 ] };
    key  <K5E> {         [             F14 ] };
    key  <K5F> {         [             F15 ] };
    key  <K6C> {         [       XF86Eject ] };
    modifier_map Control { <LCTL> };
    modifier_map Shift { <LFSH> };
    modifier_map Shift { <RTSH> };
    modifier_map Mod1 { <LALT> };
    modifier_map Lock { <CAPS> };
    modifier_map Mod2 { <NMLK> };
    modifier_map Mod5 { <MDSW> };
    modifier_map Mod5 { <LVL3> };
    modifier_map Mod1 { <ALT> };
    modifier_map Mod4 { <SUPR> };
    modifier_map Mod4 { <HYPR> };
    modifier_map Mod1 { <META> };
};

xkb_geometry "pc(pc104)" {

    width=       470;
```


Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
© ISO/IEC 2008 – All rights reserved
Not for Resale

```
height=      210;

alias <AC00> = <CAPS>;
alias <AA00> = <LCTL>;

baseColor=   "white";
labelColor=  "black";
xfont=       "-*-helvetica-medium-r-normal--*-120-*-*-*-*-iso8859-1";
description= "Generic 104";

shape "NORM" {
    corner= 1,
    { [  18,  18 ] },
    { [   2,   1 ], [  16,  16 ] }
};
shape "BKSP" {
    corner= 1,
    { [  38,  18 ] },
    { [   2,   1 ], [  36,  16 ] }
};
shape "TABK" {
    corner= 1,
    { [  28,  18 ] },
    { [   2,   1 ], [  26,  16 ] }
};
shape "BKSL" {
    corner= 1,
    { [  28,  18 ] },
    { [   2,   1 ], [  26,  16 ] }
};
shape "RTRN" {
    corner= 1,
    { [  42,  18 ] },
    { [   2,   1 ], [  40,  16 ] }
};
shape "CAPS" {
    corner= 1,
    { [  33,  18 ] },
    { [   2,   1 ], [  31,  16 ] }
};
shape "LFSH" {
    corner= 1,
    { [  42,  18 ] },
    { [   2,   1 ], [  40,  16 ] }
};
shape "RTSH" {
    corner= 1,
    { [  52,  18 ] },
    { [   2,   1 ], [  50,  16 ] }
};
shape "MODK" {
    corner= 1,
    { [  27,  18 ] },
    { [   2,   1 ], [  25,  16 ] }
};
shape "SMOD" {
    corner= 1,
    { [  23,  18 ] },
    { [   2,   1 ], [  21,  16 ] }
};
shape "SPCE" {
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        corner= 1,
        { [ 113,  18 ] },
        { [   2,   1 ], [ 111,  16 ] }
    };
    shape "KP0" {
        corner= 1,
        { [  37,  18 ] },
        { [   2,   1 ], [  35,  16 ] }
    };
    shape "KPAD" {
        corner= 1,
        { [  18,  37 ] },
        { [   2,   1 ], [  16,  35 ] }
    };
    shape "LEDS" { { [  75,  20 ] } };
    shape "LED" { { [   5,   1 ] } };
    section "Function" {
        key.color= "grey20";
        priority=  7;
        top=       52;
        left=      19;
        width=     351;
        height=    19;
        row {
            top=  1;
            left= 1;
            keys {
                {  <ESC>, "NORM",   1 },
                { <FK01>, "NORM",  20, color="white" },
                { <FK02>, "NORM",   1, color="white" },
                { <FK03>, "NORM",   1, color="white" },
                { <FK04>, "NORM",   1, color="white" },
                { <FK05>, "NORM",  11, color="white" },
                { <FK06>, "NORM",   1, color="white" },
                { <FK07>, "NORM",   1, color="white" },
                { <FK08>, "NORM",   1, color="white" },
                { <FK09>, "NORM",  11, color="white" },
                { <FK10>, "NORM",   1, color="white" },
                { <FK11>, "NORM",   1, color="white" },
                { <FK12>, "NORM",   1, color="white" },
                { <PRSC>, "NORM",   8, color="white" },
                { <SCLK>, "NORM",   1, color="white" },
                { <PAUS>, "NORM",   1, color="white" }
            };
        };
    }; // End of "Function" section

    section "Alpha" {
        key.color= "white";
        priority=  8;
        top=       91;
        left=      19;
        width=     287;
        height=    95;
        row {
            top=  1;
            left= 1;
            keys {
                { <TLDE>, "NORM",   1 }, { <AE01>, "NORM",   1 },
                { <AE02>, "NORM",   1 }, { <AE03>, "NORM",   1 },
                { <AE04>, "NORM",   1 }, { <AE05>, "NORM",   1 },
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        { <AE06>, "NORM",   1 }, { <AE07>, "NORM",   1 },
        { <AE08>, "NORM",   1 }, { <AE09>, "NORM",   1 },
        { <AE10>, "NORM",   1 }, { <AE11>, "NORM",   1 },
        { <AE12>, "NORM",   1 },
        { <BKSP>, "BKSP",   1, color="grey20" }
    };
};
row {
    top=  20;
    left= 1;
    keys {
        {  <TAB>, "TABK",   1, color="grey20" },
        { <AD01>, "NORM",   1 }, { <AD02>, "NORM",   1 },
        { <AD03>, "NORM",   1 }, { <AD04>, "NORM",   1 },
        { <AD05>, "NORM",   1 }, { <AD06>, "NORM",   1 },
        { <AD07>, "NORM",   1 }, { <AD08>, "NORM",   1 },
        { <AD09>, "NORM",   1 }, { <AD10>, "NORM",   1 },
        { <AD11>, "NORM",   1 }, { <AD12>, "NORM",   1 },
        { <BKSL>, "BKSL",   1 }
    };
};
row {
    top=  39;
    left= 1;
    keys {
        { <CAPS>, "CAPS",   1, color="grey20" },
        { <AC01>, "NORM",   1 }, { <AC02>, "NORM",   1 },
        { <AC03>, "NORM",   1 }, { <AC04>, "NORM",   1 },
        { <AC05>, "NORM",   1 }, { <AC06>, "NORM",   1 },
        { <AC07>, "NORM",   1 }, { <AC08>, "NORM",   1 },
        { <AC09>, "NORM",   1 }, { <AC10>, "NORM",   1 },
        { <AC11>, "NORM",   1 },
        { <RTRN>, "RTRN",   1, color="grey20" }
    };
};
row {
    top=  58;
    left= 1;
    keys {
        { <LFSH>, "LFSH",   1, color="grey20" },
        { <AB01>, "NORM",   1 }, { <AB02>, "NORM",   1 },
        { <AB03>, "NORM",   1 }, { <AB04>, "NORM",   1 },
        { <AB05>, "NORM",   1 }, { <AB06>, "NORM",   1 },
        { <AB07>, "NORM",   1 }, { <AB08>, "NORM",   1 },
        { <AB09>, "NORM",   1 }, { <AB10>, "NORM",   1 },
        { <RTSH>, "RTSH",   1, color="grey20" }
    };
};
row {
    top=  77;
    left= 1;
    keys {
        { <LCTL>, "MODK",   1, color="grey20" },
        { <LWIN>, "SMOD",   1, color="grey20" },
        { <LALT>, "SMOD",   1, color="grey20" },
        { <SPCE>, "SPCE",   1 },
        { <RALT>, "SMOD",   1, color="grey20" },
        { <RWIN>, "SMOD",   1, color="grey20" },
        { <MENU>, "SMOD",   1, color="grey20" },
        { <RCTL>, "SMOD",   1, color="grey20" }
    };
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        };
    }; // End of "Alpha" section

    section "Editing" {
        key.color= "grey20";
        priority=  9;
        top=       91;
        left=      312;
        width=     58;
        height=    95;
        row {
            top=  1;
            left= 1;
            keys {
                {  <INS>, "NORM",   1 }, { <HOME>, "NORM",   1 },
                { <PGUP>, "NORM",   1 }
            };
        };
        row {
            top=  20;
            left= 1;
            keys {
                { <DELE>, "NORM",   1 }, {  <END>, "NORM",   1 },
                { <PGDN>, "NORM",   1 }
            };
        };
        row {
            top=  58;
            left= 20;
            keys {
                {   <UP>, "NORM",   1 }
            };
        };
        row {
            top=  77;
            left= 1;
            keys {
                { <LEFT>, "NORM",   1 }, { <DOWN>, "NORM",   1 },
                { <RGHT>, "NORM",   1 }
            };
        };
    }; // End of "Editing" section

    section "Keypad" {
        key.color= "grey20";
        priority=  10;
        top=       91;
        left=      376;
        width=     77;
        height=    95;
        row {
            top=  1;
            left= 1;
            keys {
                { <NMLK>, "NORM",   1 }, { <KPDV>, "NORM",   1 },
                { <KPMU>, "NORM",   1 }, { <KPSU>, "NORM",   1 }
            };
        };
        row {
            top=  20;
            left= 1;
```


Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale
© ISO/IEC 2008 – All rights reserved

```
        keys {
            {  <KP7>, "NORM",   1, color="white" },
            {  <KP8>, "NORM",   1, color="white" },
            {  <KP9>, "NORM",   1, color="white" },
            { <KPAD>, "KPAD",   1 }
        };
    };
    row {
        top=  39;
        left= 1;
        keys {
            {  <KP4>, "NORM",   1, color="white" },
            {  <KP5>, "NORM",   1, color="white" },
            {  <KP6>, "NORM",   1, color="white" }
        };
    };
    row {
        top=  58;
        left= 1;
        keys {
            {  <KP1>, "NORM",   1, color="white" },
            {  <KP2>, "NORM",   1, color="white" },
            {  <KP3>, "NORM",   1, color="white" },
            { <KPEN>, "KPAD",   1 }
        };
    };
    row {
        top=  77;
        left= 1;
        keys {
            {  <KP0>, "KP0",   1, color="white" },
            { <KPDL>, "NORM",   1, color="white" }
        };
    };
}; // End of "Keypad" section

solid "LedPanel" {
    top=      52;
    left=     377;
    priority= 0;
    color= "grey10";
    shape= "LEDS";
};
indicator "Num Lock" {
    top=      67;
    left=     382;
    priority= 1;
    onColor= "green";
    offColor= "green30";
    shape= "LED";
};
indicator "Caps Lock" {
    top=      67;
    left=     407;
    priority= 2;
    onColor= "green";
    offColor= "green30";
    shape= "LED";
};
indicator "Scroll Lock" {
    top=      67;
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        left=     433;
        priority= 3;
        onColor= "green";
        offColor= "green30";
        shape= "LED";
    };
    text "NumLockLabel" {
        top=      55;
        left=     378;
        priority= 4;
        width=  19.8;
        height=  10;
        XFont= "-*-helvetica-medium-r-normal--*-120-*-*-*-*-iso8859-1";
        text=  "Num\nLock";
    };
    text "CapsLockLabel" {
        top=      55;
        left=     403;
        priority= 5;
        width=  26.4;
        height=  10;
        XFont= "-*-helvetica-medium-r-normal--*-120-*-*-*-*-iso8859-1";
        text=  "Caps\nLock";
    };
    text "ScrollLockLabel" {
        top=      55;
        left=     428;
        priority= 6;
        width=  39.6;
        height=  10;
        XFont= "-*-helvetica-medium-r-normal--*-120-*-*-*-*-iso8859-1";
        text=  "Scroll\nLock";
    };
};

};
```

D.2.3 Example of keyboard description in ISO/IEC 24757 syntax

The following is the data to describe the keyboard defined in annex D.2.2 in the format described in Annex B.

```
<keyboard xmlns="http://www.iso.org/jtc1/sc35/wg1/iso24757">
    <dictionaries>
        <keycodes>
            <keycode id="ESC" value="9"/>
            <keycode id="AE01" value="10"/>
            <keycode id="AE02" value="11"/>
            <keycode id="AE03" value="12"/>
            <keycode id="AE04" value="13"/>
            <keycode id="AE05" value="14"/>
            <keycode id="AE06" value="15"/>
            <keycode id="AE07" value="16"/>
            <keycode id="AE08" value="17"/>
            <keycode id="AE09" value="18"/>
            <keycode id="AE10" value="19"/>
            <keycode id="AE11" value="20"/>
            <keycode id="AE12" value="21"/>
            <keycode id="BKSP" value="22"/>
            <keycode id="TAB" value="23"/>
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
<keycode id="AD01" value="24"/>
<keycode id="AD02" value="25"/>
<keycode id="AD03" value="26"/>
<keycode id="AD04" value="27"/>
<keycode id="AD05" value="28"/>
<keycode id="AD06" value="29"/>
<keycode id="AD07" value="30"/>
<keycode id="AD08" value="31"/>
<keycode id="AD09" value="32"/>
<keycode id="AD10" value="33"/>
<keycode id="AD11" value="34"/>
<keycode id="AD12" value="35"/>
<keycode id="RTRN" value="36"/>
<keycode id="LCTL" value="37"/>
<keycode id="AC01" value="38"/>
<keycode id="AC02" value="39"/>
<keycode id="AC03" value="40"/>
<keycode id="AC04" value="41"/>
<keycode id="AC05" value="42"/>
<keycode id="AC06" value="43"/>
<keycode id="AC07" value="44"/>
<keycode id="AC08" value="45"/>
<keycode id="AC09" value="46"/>
<keycode id="AC10" value="47"/>
<keycode id="AC11" value="48"/>
<keycode id="TLDE" value="49"/>
<keycode id="LFSH" value="50"/>
<keycode id="BKSL" value="51"/>
<keycode id="AB01" value="52"/>
<keycode id="AB02" value="53"/>
<keycode id="AB03" value="54"/>
<keycode id="AB04" value="55"/>
<keycode id="AB05" value="56"/>
<keycode id="AB06" value="57"/>
<keycode id="AB07" value="58"/>
<keycode id="AB08" value="59"/>
<keycode id="AB09" value="60"/>
<keycode id="AB10" value="61"/>
<keycode id="RTSH" value="62"/>
<keycode id="KPMU" value="63"/>
<keycode id="LALT" value="64"/>
<keycode id="SPCE" value="65"/>
<keycode id="CAPS" value="66"/>
<keycode id="FK01" value="67"/>
<keycode id="FK02" value="68"/>
<keycode id="FK03" value="69"/>
<keycode id="FK04" value="70"/>
<keycode id="FK05" value="71"/>
<keycode id="FK06" value="72"/>
<keycode id="FK07" value="73"/>
<keycode id="FK08" value="74"/>
<keycode id="FK09" value="75"/>
<keycode id="FK10" value="76"/>
<keycode id="NMLK" value="77"/>
<keycode id="SCLK" value="78"/>
<keycode id="KP7" value="79"/>
<keycode id="KP8" value="80"/>
<keycode id="KP9" value="81"/>
<keycode id="KPSU" value="82"/>
<keycode id="KP4" value="83"/>
<keycode id="KP5" value="84"/>
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
<keycode id="KP6" value="85"/>
<keycode id="KPAD" value="86"/>
<keycode id="KP1" value="87"/>
<keycode id="KP2" value="88"/>
<keycode id="KP3" value="89"/>
<keycode id="KP0" value="90"/>
<keycode id="KPDL" value="91"/>
<keycode id="SYRQ" value="92"/>
<keycode id="MDSW" value="93"/>
<keycode id="LSGT" value="94"/>
<keycode id="FK11" value="95"/>
<keycode id="FK12" value="96"/>
<keycode id="HOME" value="97"/>
<keycode id="UP" value="98"/>
<keycode id="PGUP" value="99"/>
<keycode id="LEFT" value="100"/>
<keycode id="II65" value="101"/>
<keycode id="RGHT" value="102"/>
<keycode id="END" value="103"/>
<keycode id="DOWN" value="104"/>
<keycode id="PGDN" value="105"/>
<keycode id="INS" value="106"/>
<keycode id="DELE" value="107"/>
<keycode id="KPEN" value="108"/>
<keycode id="RCTL" value="109"/>
<keycode id="PAUS" value="110"/>
<keycode id="PRSC" value="111"/>
<keycode id="KPDV" value="112"/>
<keycode id="RALT" value="113"/>
<keycode id="BRK" value="114"/>
<keycode id="LWIN" value="115"/>
<keycode id="RWIN" value="116"/>
<keycode id="MENU" value="117"/>
<keycode id="FK13" value="118"/>
<keycode id="FK14" value="119"/>
<keycode id="FK15" value="120"/>
<keycode id="FK16" value="121"/>
<keycode id="FK17" value="122"/>
<keycode id="KPDC" value="123"/>
<keycode id="LVL3" value="124"/>
<keycode id="ALT" value="125"/>
<keycode id="KPEQ" value="126"/>
<keycode id="SUPR" value="127"/>
<keycode id="HYPR" value="128"/>
<keycode id="XFER" value="129"/>
<keycode id="I02" value="130"/>
<keycode id="NFER" value="131"/>
<keycode id="I04" value="132"/>
<keycode id="AE13" value="133"/>
<keycode id="I06" value="134"/>
<keycode id="I07" value="135"/>
<keycode id="I08" value="136"/>
<keycode id="I09" value="137"/>
<keycode id="I0A" value="138"/>
<keycode id="I0B" value="139"/>
<keycode id="I0C" value="140"/>
<keycode id="I0D" value="141"/>
<keycode id="I0E" value="142"/>
<keycode id="I0F" value="143"/>
<keycode id="I10" value="144"/>
<keycode id="I11" value="145"/>
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
<keycode id="I12" value="146"/>
<keycode id="I13" value="147"/>
<keycode id="I14" value="148"/>
<keycode id="I15" value="149"/>
<keycode id="I16" value="150"/>
<keycode id="I17" value="151"/>
<keycode id="I18" value="152"/>
<keycode id="I19" value="153"/>
<keycode id="I1A" value="154"/>
<keycode id="I1B" value="155"/>
<keycode id="META" value="156"/>
<keycode id="K59" value="157"/>
<keycode id="I1E" value="158"/>
<keycode id="I1F" value="159"/>
<keycode id="I20" value="160"/>
<keycode id="I21" value="161"/>
<keycode id="I22" value="162"/>
<keycode id="I23" value="163"/>
<keycode id="I24" value="164"/>
<keycode id="I25" value="165"/>
<keycode id="I26" value="166"/>
<keycode id="I27" value="167"/>
<keycode id="I28" value="168"/>
<keycode id="I29" value="169"/>
<keycode id="K5A" value="170"/>
<keycode id="I2B" value="171"/>
<keycode id="I2C" value="172"/>
<keycode id="I2D" value="173"/>
<keycode id="I2E" value="174"/>
<keycode id="I2F" value="175"/>
<keycode id="I30" value="176"/>
<keycode id="I31" value="177"/>
<keycode id="I32" value="178"/>
<keycode id="I33" value="179"/>
<keycode id="I34" value="180"/>
<keycode id="K5B" value="181"/>
<keycode id="K5D" value="182"/>
<keycode id="K5E" value="183"/>
<keycode id="K5F" value="184"/>
<keycode id="I39" value="185"/>
<keycode id="I3A" value="186"/>
<keycode id="I3B" value="187"/>
<keycode id="I3C" value="188"/>
<keycode id="K62" value="189"/>
<keycode id="K63" value="190"/>
<keycode id="K64" value="191"/>
<keycode id="K65" value="192"/>
<keycode id="K66" value="193"/>
<keycode id="I42" value="194"/>
<keycode id="I43" value="195"/>
<keycode id="I44" value="196"/>
<keycode id="I45" value="197"/>
<keycode id="K67" value="198"/>
<keycode id="K68" value="199"/>
<keycode id="K69" value="200"/>
<keycode id="K6A" value="201"/>
<keycode id="I4A" value="202"/>
<keycode id="K6B" value="203"/>
<keycode id="K6C" value="204"/>
<keycode id="K6D" value="205"/>
<keycode id="K6E" value="206"/>
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
<keycode id="K6F" value="207"/>
<keycode id="HKTG" value="208"/>
<keycode id="KANA" value="209"/>
<keycode id="EISU" value="210"/>
<keycode id="AB11" value="211"/>
<keycode id="I54" value="212"/>
<keycode id="I55" value="213"/>
<keycode id="I56" value="214"/>
<keycode id="I57" value="215"/>
<keycode id="I58" value="216"/>
<keycode id="I59" value="217"/>
<keycode id="I5A" value="218"/>
<keycode id="K74" value="219"/>
<keycode id="K75" value="220"/>
<keycode id="K76" value="221"/>
<keycode id="I5E" value="222"/>
<keycode id="I5F" value="223"/>
<keycode id="I60" value="224"/>
<keycode id="I61" value="225"/>
<keycode id="I62" value="226"/>
<keycode id="I63" value="227"/>
<keycode id="I64" value="228"/>
<keycode id="I65" value="229"/>
<keycode id="I66" value="230"/>
<keycode id="I67" value="231"/>
<keycode id="I68" value="232"/>
<keycode id="I69" value="233"/>
<keycode id="I6A" value="234"/>
<keycode id="I6B" value="235"/>
<keycode id="I6C" value="236"/>
<keycode id="I6D" value="237"/>
<keycode id="I6E" value="238"/>
<keycode id="I6F" value="239"/>
<keycode id="I70" value="240"/>
<keycode id="I71" value="241"/>
<keycode id="I72" value="242"/>
<keycode id="I73" value="243"/>
<keycode id="I74" value="244"/>
<keycode id="I75" value="245"/>
<keycode id="I76" value="246"/>
<keycode id="I77" value="247"/>
<keycode id="I78" value="248"/>
<keycode id="I79" value="249"/>
<keycode id="I7A" value="250"/>
<keycode id="I7B" value="251"/>
<keycode id="I7C" value="252"/>
<keycode id="I7D" value="253"/>
<keycode id="I7E" value="254"/>
<keycode id="I7F" value="255"/>
<alias id="HZTG" ref="TLDE"/>
<alias id="HNGL" ref="FK16"/>
<alias id="HJCV" ref="FK17"/>
<alias id="I01" ref="XFER"/>
<alias id="I03" ref="NFER"/>
<alias id="I05" ref="AE13"/>
<alias id="K5C" ref="KPEQ"/>
<alias id="K70" ref="HKTG"/>
<alias id="K71" ref="KANA"/>
<alias id="K72" ref="EISU"/>
<alias id="K73" ref="AB11"/>
<alias id="LMTA" ref="LWIN"/>
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        <alias id="RMTA" ref="RWIN"/>
        <alias id="COMP" ref="MENU"/>
        <alias id="POWR" ref="I0C"/>
        <alias id="MUTE" ref="I0D"/>
        <alias id="VOL-" ref="I0E"/>
        <alias id="VOL+" ref="I0F"/>
        <alias id="HELP" ref="I10"/>
        <alias id="STOP" ref="I11"/>
        <alias id="AGAI" ref="I12"/>
        <alias id="PROP" ref="I13"/>
        <alias id="UNDO" ref="I14"/>
        <alias id="FRNT" ref="I15"/>
        <alias id="COPY" ref="I16"/>
        <alias id="OPEN" ref="I17"/>
        <alias id="PAST" ref="I18"/>
        <alias id="FIND" ref="I19"/>
        <alias id="CUT" ref="I1A"/>
        <alias id="ALGR" ref="RALT"/>
        <alias id="LatQ" ref="AD01"/>
        <alias id="LatW" ref="AD02"/>
        <alias id="LatE" ref="AD03"/>
        <alias id="LatR" ref="AD04"/>
        <alias id="LatT" ref="AD05"/>
        <alias id="LatY" ref="AD06"/>
        <alias id="LatU" ref="AD07"/>
        <alias id="LatI" ref="AD08"/>
        <alias id="LatO" ref="AD09"/>
        <alias id="LatP" ref="AD10"/>
        <alias id="LatA" ref="AC01"/>
        <alias id="LatS" ref="AC02"/>
        <alias id="LatD" ref="AC03"/>
        <alias id="LatF" ref="AC04"/>
        <alias id="LatG" ref="AC05"/>
        <alias id="LatH" ref="AC06"/>
        <alias id="LatJ" ref="AC07"/>
        <alias id="LatK" ref="AC08"/>
        <alias id="LatL" ref="AC09"/>
        <alias id="LatZ" ref="AB01"/>
        <alias id="LatX" ref="AB02"/>
        <alias id="LatC" ref="AB03"/>
        <alias id="LatV" ref="AB04"/>
        <alias id="LatB" ref="AB05"/>
        <alias id="LatN" ref="AB06"/>
        <alias id="LatM" ref="AB07"/>
    </keycodes>
    <modifiers>
        <modifier name="Shift"/>
        <modifier name="Lock"/>
        <modifier name="Control"/>
        <modifier name="Mod1"/>
        <modifier name="Mod2"/>
        <modifier name="Mod3"/>
        <modifier name="Mod4"/>
        <modifier name="Mod5"/>
        <modifier name="NumLock"/>
        <modifier name="Alt"/>
        <modifier name="LevelThree"/>
        <modifier name="ScrollLock"/>
        <modifier name="LevelFive"/>
        <modifier name="AltGr"/>
        <modifier name="Meta"/>
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        <modifier name="Super"/>
        <modifier name="Hyper"/>
    </modifiers>
    <types>
        <type name="ONE_LEVEL" numLevels="1">
            <map>
            </map>
        </type>
        <type name="TWO_LEVEL" numLevels="2">
            <map>
                <!--  vmods: 0, rmods: 1  -->
                <mapEntry level="2">
                    <modifier name="Shift"/>
                </mapEntry>
            </map>
        </type>
        <type name="ALPHABETIC" numLevels="2">
            <map>
                <!--  vmods: 0, rmods: 1  -->
                <mapEntry level="2">
                    <modifier name="Shift"/>
                </mapEntry>
                <!--  vmods: 0, rmods: 2  -->
                <mapEntry level="2">
                    <modifier name="Lock"/>
                </mapEntry>
            </map>
        </type>
        <type name="KEYPAD" numLevels="2">
            <map>
                <!--  vmods: 0, rmods: 1  -->
                <mapEntry level="2">
                    <modifier name="Shift"/>
                </mapEntry>
                <!--  vmods: 1, rmods: 0  -->
                <mapEntry level="2">
                    <modifier name="NumLock"/>
                </mapEntry>
            </map>
        </type>
        <type name="SHIFT+ALT" numLevels="2">
            <map>
                <!--  vmods: 2, rmods: 1  -->
                <mapEntry level="2">
                    <modifier name="Shift"/>
                    <modifier name="Alt"/>
                </mapEntry>
            </map>
        </type>
        <type name="PC_BREAK" numLevels="2">
            <map>
                <!--  vmods: 0, rmods: 4  -->
                <mapEntry level="2">
                    <modifier name="Control"/>
                </mapEntry>
            </map>
        </type>
        <type name="PC_ALT_LEVEL2" numLevels="2">
            <map>
                <!--  vmods: 2, rmods: 0  -->
                <mapEntry level="2">
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            <modifier name="Alt"/>
        </mapEntry>
    </map>
</type>
<type name="PC_SYSRQ" numLevels="3">
    <map>
        <!--  vmods: 2, rmods: 0  -->
        <mapEntry level="2">
            <modifier name="Alt"/>
        </mapEntry>
        <!--  vmods: 4, rmods: 0  -->
        <mapEntry level="3">
            <modifier name="LevelThree"/>
        </mapEntry>
    </map>
</type>
<type name="CTRL+ALT" numLevels="2">
    <map>
        <!--  vmods: 2, rmods: 4  -->
        <mapEntry level="2">
            <modifier name="Control"/>
            <modifier name="Alt"/>
        </mapEntry>
    </map>
</type>
<type name="THREE_LEVEL" numLevels="3">
    <map>
        <!--  vmods: 0, rmods: 1  -->
        <mapEntry level="2">
            <modifier name="Shift"/>
        </mapEntry>
        <!--  vmods: 4, rmods: 0  -->
        <mapEntry level="3">
            <modifier name="LevelThree"/>
        </mapEntry>
        <!--  vmods: 4, rmods: 1  -->
        <mapEntry level="3">
            <modifier name="Shift"/>
            <modifier name="LevelThree"/>
        </mapEntry>
    </map>
</type>
<type name="EIGHT_LEVEL" numLevels="8">
    <map>
        <!--  vmods: 0, rmods: 1  -->
        <mapEntry level="2">
            <modifier name="Shift"/>
        </mapEntry>
        <!--  vmods: 4, rmods: 0  -->
        <mapEntry level="3">
            <modifier name="LevelThree"/>
        </mapEntry>
        <!--  vmods: 4, rmods: 1  -->
        <mapEntry level="4">
            <modifier name="Shift"/>
            <modifier name="LevelThree"/>
        </mapEntry>
        <!--  vmods: 14, rmods: 0  -->
        <mapEntry level="7">
            <modifier name="LevelThree"/>
            <modifier name="LevelFive"/>
```

© ISO/IEC 2008 All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            </mapEntry>
            <!--  vmods: 14, rmods: 1  -->
            <mapEntry level="8">
                <modifier name="Shift"/>
                <modifier name="LevelThree"/>
                <modifier name="LevelFive"/>
            </mapEntry>
        </map>
    </type>
    <type name="EIGHT_LEVEL_ALPHABETIC" numLevels="8">
        <map>
            <!--  vmods: 0, rmods: 1  -->
            <mapEntry level="2">
                <modifier name="Shift"/>
            </mapEntry>
            <!--  vmods: 0, rmods: 2  -->
            <mapEntry level="2">
                <modifier name="Lock"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 0  -->
            <mapEntry level="3">
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 1  -->
            <mapEntry level="4">
                <modifier name="Shift"/>
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 2  -->
            <mapEntry level="4">
                <modifier name="Lock"/>
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 3  -->
            <mapEntry level="3">
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 14, rmods: 0  -->
            <mapEntry level="7">
                <modifier name="LevelThree"/>
                <modifier name="LevelFive"/>
            </mapEntry>
            <!--  vmods: 14, rmods: 1  -->
            <mapEntry level="8">
                <modifier name="Shift"/>
                <modifier name="LevelThree"/>
                <modifier name="LevelFive"/>
            </mapEntry>
            <!--  vmods: 14, rmods: 2  -->
            <mapEntry level="8">
                <modifier name="Lock"/>
                <modifier name="LevelThree"/>
                <modifier name="LevelFive"/>
            </mapEntry>
            <!--  vmods: 14, rmods: 3  -->
            <mapEntry level="7">
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="LevelThree"/>
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            <modifier name="LevelFive"/>
        </mapEntry>
    </map>
</type>
<type name="EIGHT_LEVEL_SEMIALPHABETIC" numLevels="8">
    <map>
        <!--  vmods: 0, rmods: 1  -->
        <mapEntry level="2">
            <modifier name="Shift"/>
        </mapEntry>
        <!--  vmods: 0, rmods: 2  -->
        <mapEntry level="2">
            <modifier name="Lock"/>
        </mapEntry>
        <!--  vmods: 4, rmods: 0  -->
        <mapEntry level="3">
            <modifier name="LevelThree"/>
        </mapEntry>
        <!--  vmods: 4, rmods: 1  -->
        <mapEntry level="4">
            <modifier name="Shift"/>
            <modifier name="LevelThree"/>
        </mapEntry>
        <!--  vmods: 4, rmods: 2  -->
        <mapEntry level="3">
            <modifier name="Lock"/>
            <modifier name="LevelThree"/>
        </mapEntry>
        <!--  vmods: 4, rmods: 3  -->
        <mapEntry level="4">
            <modifier name="Shift"/>
            <modifier name="Lock"/>
            <modifier name="LevelThree"/>
        </mapEntry>
        <!--  vmods: 14, rmods: 0  -->
        <mapEntry level="7">
            <modifier name="LevelThree"/>
            <modifier name="LevelFive"/>
        </mapEntry>
        <!--  vmods: 14, rmods: 1  -->
        <mapEntry level="8">
            <modifier name="Shift"/>
            <modifier name="LevelThree"/>
            <modifier name="LevelFive"/>
        </mapEntry>
        <!--  vmods: 14, rmods: 2  -->
        <mapEntry level="7">
            <modifier name="Lock"/>
            <modifier name="LevelThree"/>
            <modifier name="LevelFive"/>
        </mapEntry>
        <!--  vmods: 14, rmods: 3  -->
        <mapEntry level="8">
            <modifier name="Shift"/>
            <modifier name="Lock"/>
            <modifier name="LevelThree"/>
            <modifier name="LevelFive"/>
        </mapEntry>
    </map>
</type>
<type name="FOUR_LEVEL" numLevels="4">
```

© ISO/IEC 2008 All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        <map>
            <!--  vmods: 0, rmods: 1  -->
            <mapEntry level="2">
                <modifier name="Shift"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 0  -->
            <mapEntry level="3">
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 1  -->
            <mapEntry level="4">
                <modifier name="Shift"/>
                <modifier name="LevelThree"/>
            </mapEntry>
        </map>
    </type>
    <type name="FOUR_LEVEL_ALPHABETIC" numLevels="4">
        <map>
            <!--  vmods: 0, rmods: 1  -->
            <mapEntry level="2">
                <modifier name="Shift"/>
            </mapEntry>
            <!--  vmods: 0, rmods: 2  -->
            <mapEntry level="2">
                <modifier name="Lock"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 0  -->
            <mapEntry level="3">
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 1  -->
            <mapEntry level="4">
                <modifier name="Shift"/>
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 2  -->
            <mapEntry level="4">
                <modifier name="Lock"/>
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 3  -->
            <mapEntry level="3">
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="LevelThree"/>
            </mapEntry>
        </map>
    </type>
    <type name="FOUR_LEVEL_SEMIALPHABETIC" numLevels="4">
        <map>
            <!--  vmods: 0, rmods: 1  -->
            <mapEntry level="2">
                <modifier name="Shift"/>
            </mapEntry>
            <!--  vmods: 0, rmods: 2  -->
            <mapEntry level="2">
                <modifier name="Lock"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 0  -->
            <mapEntry level="3">
                <modifier name="LevelThree"/>
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            </mapEntry>
            <!--  vmods: 4, rmods: 1  -->
            <mapEntry level="4">
                <modifier name="Shift"/>
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 2  -->
            <mapEntry level="3">
                <modifier name="Lock"/>
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 3  -->
            <mapEntry level="4">
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="LevelThree"/>
            </mapEntry>
        </map>
    </type>
    <type name="FOUR_LEVEL_MIXED_KEYPAD" numLevels="4">
        <map>
            <!--  vmods: 1, rmods: 0  -->
            <mapEntry level="2">
                <modifier name="NumLock"/>
            </mapEntry>
            <!--  vmods: 0, rmods: 1  -->
            <mapEntry level="2">
                <modifier name="Shift"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 0  -->
            <mapEntry level="3">
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 5, rmods: 0  -->
            <mapEntry level="3">
                <modifier name="NumLock"/>
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 1  -->
            <mapEntry level="4">
                <modifier name="Shift"/>
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 5, rmods: 1  -->
            <mapEntry level="4">
                <modifier name="Shift"/>
                <modifier name="NumLock"/>
                <modifier name="LevelThree"/>
            </mapEntry>
        </map>
    </type>
    <type name="FOUR_LEVEL_X" numLevels="4">
        <map>
            <!--  vmods: 4, rmods: 0  -->
            <mapEntry level="2">
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 1  -->
            <mapEntry level="3">
                <modifier name="Shift"/>
                <modifier name="LevelThree"/>
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            </mapEntry>
            <!--  vmods: 2, rmods: 4  -->
            <mapEntry level="4">
                <modifier name="Control"/>
                <modifier name="Alt"/>
            </mapEntry>
        </map>
    </type>
    <type name="SEPARATE_CAPS_AND_SHIFT_ALPHABETIC" numLevels="4">
        <map>
            <!--  vmods: 0, rmods: 1  -->
            <mapEntry level="2">
                <modifier name="Shift"/>
            </mapEntry>
            <!--  vmods: 0, rmods: 2  -->
            <mapEntry level="4">
                <modifier name="Lock"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 0  -->
            <mapEntry level="3">
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 1  -->
            <mapEntry level="4">
                <modifier name="Shift"/>
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 2  -->
            <mapEntry level="3">
                <modifier name="Lock"/>
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 3  -->
            <mapEntry level="3">
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="LevelThree"/>
            </mapEntry>
        </map>
    </type>
    <type name="FOUR_LEVEL_KEYPAD" numLevels="4">
        <map>
            <!--  vmods: 0, rmods: 1  -->
            <mapEntry level="2">
                <modifier name="Shift"/>
            </mapEntry>
            <!--  vmods: 1, rmods: 0  -->
            <mapEntry level="2">
                <modifier name="NumLock"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 0  -->
            <mapEntry level="3">
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 4, rmods: 1  -->
            <mapEntry level="4">
                <modifier name="Shift"/>
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 5, rmods: 0  -->
            <mapEntry level="4">
```


Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
© ISO/IEC 2008 – All rights reserved
Not for Resale

```
                <modifier name="NumLock"/>
                <modifier name="LevelThree"/>
            </mapEntry>
            <!--  vmods: 5, rmods: 1  -->
            <mapEntry level="3">
                <modifier name="Shift"/>
                <modifier name="NumLock"/>
                <modifier name="LevelThree"/>
            </mapEntry>
        </map>
    </type>
</types>
<interpretation>
    <rule>
        <condition>
            <keysym id="ISO_Level2_Latch"/>
            <modifiersList predicate="exactly">
                <modifier name="Shift"/>
            </modifiersList>
        </condition>
        <action>
            <latch changeType="modifiers">
                <!--  flags: 3  -->
                <modifier name="Shift"/>
            </latch>
        </action>
    </rule>
    <rule>
        <condition>
            <keysym id="Shift_Lock"/>
            <modifiersList predicate="any">
                <modifier name="Shift"/>
                <modifier name="Lock"/>
            </modifiersList>
        </condition>
        <action>
            <lock changeType="modifiers">
                <!--  flags: 0  -->
                <modifier name="Shift"/>
            </lock>
        </action>
    </rule>
    <rule>
        <condition>
            <keysym id="Num_Lock"/>
            <modifiersList predicate="any">
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="Control"/>
                <modifier name="Mod1"/>
                <modifier name="Mod2"/>
                <modifier name="Mod3"/>
                <modifier name="Mod4"/>
                <modifier name="Mod5"/>
            </modifiersList>
        </condition>
        <action>
            <lock changeType="modifiers">
                <!--  flags: 0  -->
                <modifier name="NumLock"/>
            </lock>
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    </action>
</rule>
<rule>
    <condition>
        <keysym id="ISO_Level3_Shift"/>
        <modifiersList predicate="any">
            <modifier name="Shift"/>
            <modifier name="Lock"/>
            <modifier name="Control"/>
            <modifier name="Mod1"/>
            <modifier name="Mod2"/>
            <modifier name="Mod3"/>
            <modifier name="Mod4"/>
            <modifier name="Mod5"/>
        </modifiersList>
    </condition>
    <action>
        <set changeType="modifiers">
            <!--  flags: 1  -->
            <modifier name="LevelThree"/>
        </set>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="ISO_Level3_Latch"/>
        <modifiersList predicate="any">
            <modifier name="Shift"/>
            <modifier name="Lock"/>
            <modifier name="Control"/>
            <modifier name="Mod1"/>
            <modifier name="Mod2"/>
            <modifier name="Mod3"/>
            <modifier name="Mod4"/>
            <modifier name="Mod5"/>
        </modifiersList>
    </condition>
    <action>
        <latch changeType="modifiers">
            <!--  flags: 3  -->
            <modifier name="LevelThree"/>
        </latch>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="ISO_Level3_Lock"/>
        <modifiersList predicate="any">
            <modifier name="Shift"/>
            <modifier name="Lock"/>
            <modifier name="Control"/>
            <modifier name="Mod1"/>
            <modifier name="Mod2"/>
            <modifier name="Mod3"/>
            <modifier name="Mod4"/>
            <modifier name="Mod5"/>
        </modifiersList>
    </condition>
    <action>
        <lock changeType="modifiers">
            <!--  flags: 0  -->
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            <modifier name="LevelThree"/>
        </lock>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="Alt_L"/>
        <modifiersList predicate="any">
            <modifier name="Shift"/>
            <modifier name="Lock"/>
            <modifier name="Control"/>
            <modifier name="Mod1"/>
            <modifier name="Mod2"/>
            <modifier name="Mod3"/>
            <modifier name="Mod4"/>
            <modifier name="Mod5"/>
        </modifiersList>
    </condition>
    <action>
        <set changeType="modifiers">
            <!--  flags: 5  -->
            <modifier name="Shift"/>
            <modifier name="Lock"/>
            <modifier name="Control"/>
            <modifier name="Mod1"/>
            <modifier name="Mod2"/>
            <modifier name="Mod3"/>
            <modifier name="Mod4"/>
            <modifier name="Mod5"/>
        </set>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="Alt_R"/>
        <modifiersList predicate="any">
            <modifier name="Shift"/>
            <modifier name="Lock"/>
            <modifier name="Control"/>
            <modifier name="Mod1"/>
            <modifier name="Mod2"/>
            <modifier name="Mod3"/>
            <modifier name="Mod4"/>
            <modifier name="Mod5"/>
        </modifiersList>
    </condition>
    <action>
        <set changeType="modifiers">
            <!--  flags: 5  -->
            <modifier name="Shift"/>
            <modifier name="Lock"/>
            <modifier name="Control"/>
            <modifier name="Mod1"/>
            <modifier name="Mod2"/>
            <modifier name="Mod3"/>
            <modifier name="Mod4"/>
            <modifier name="Mod5"/>
        </set>
    </action>
</rule>
<rule>
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale

```
        <condition>
            <keysym id="Meta_L"/>
            <modifiersList predicate="any">
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="Control"/>
                <modifier name="Mod1"/>
                <modifier name="Mod2"/>
                <modifier name="Mod3"/>
                <modifier name="Mod4"/>
                <modifier name="Mod5"/>
            </modifiersList>
        </condition>
        <action>
            <set changeType="modifiers">
                <!--  flags: 5  -->
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="Control"/>
                <modifier name="Mod1"/>
                <modifier name="Mod2"/>
                <modifier name="Mod3"/>
                <modifier name="Mod4"/>
                <modifier name="Mod5"/>
            </set>
        </action>
    </rule>
    <rule>
        <condition>
            <keysym id="Meta_R"/>
            <modifiersList predicate="any">
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="Control"/>
                <modifier name="Mod1"/>
                <modifier name="Mod2"/>
                <modifier name="Mod3"/>
                <modifier name="Mod4"/>
                <modifier name="Mod5"/>
            </modifiersList>
        </condition>
        <action>
            <set changeType="modifiers">
                <!--  flags: 5  -->
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="Control"/>
                <modifier name="Mod1"/>
                <modifier name="Mod2"/>
                <modifier name="Mod3"/>
                <modifier name="Mod4"/>
                <modifier name="Mod5"/>
            </set>
        </action>
    </rule>
    <rule>
        <condition>
            <keysym id="Super_L"/>
            <modifiersList predicate="any">
                <modifier name="Shift"/>
                <modifier name="Lock"/>
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                <modifier name="Control"/>
                <modifier name="Mod1"/>
                <modifier name="Mod2"/>
                <modifier name="Mod3"/>
                <modifier name="Mod4"/>
                <modifier name="Mod5"/>
            </modifiersList>
        </condition>
        <action>
            <set changeType="modifiers">
                <!--  flags: 5  -->
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="Control"/>
                <modifier name="Mod1"/>
                <modifier name="Mod2"/>
                <modifier name="Mod3"/>
                <modifier name="Mod4"/>
                <modifier name="Mod5"/>
            </set>
        </action>
    </rule>
    <rule>
        <condition>
            <keysym id="Super_R"/>
            <modifiersList predicate="any">
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="Control"/>
                <modifier name="Mod1"/>
                <modifier name="Mod2"/>
                <modifier name="Mod3"/>
                <modifier name="Mod4"/>
                <modifier name="Mod5"/>
            </modifiersList>
        </condition>
        <action>
            <set changeType="modifiers">
                <!--  flags: 5  -->
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="Control"/>
                <modifier name="Mod1"/>
                <modifier name="Mod2"/>
                <modifier name="Mod3"/>
                <modifier name="Mod4"/>
                <modifier name="Mod5"/>
            </set>
        </action>
    </rule>
    <rule>
        <condition>
            <keysym id="Hyper_L"/>
            <modifiersList predicate="any">
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="Control"/>
                <modifier name="Mod1"/>
                <modifier name="Mod2"/>
                <modifier name="Mod3"/>
                <modifier name="Mod4"/>
```

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                <modifier name="Mod5"/>
            </modifiersList>
        </condition>
        <action>
            <set changeType="modifiers">
                <!--  flags: 5  -->
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="Control"/>
                <modifier name="Mod1"/>
                <modifier name="Mod2"/>
                <modifier name="Mod3"/>
                <modifier name="Mod4"/>
                <modifier name="Mod5"/>
            </set>
        </action>
    </rule>
    <rule>
        <condition>
            <keysym id="Hyper_R"/>
            <modifiersList predicate="any">
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="Control"/>
                <modifier name="Mod1"/>
                <modifier name="Mod2"/>
                <modifier name="Mod3"/>
                <modifier name="Mod4"/>
                <modifier name="Mod5"/>
            </modifiersList>
        </condition>
        <action>
            <set changeType="modifiers">
                <!--  flags: 5  -->
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="Control"/>
                <modifier name="Mod1"/>
                <modifier name="Mod2"/>
                <modifier name="Mod3"/>
                <modifier name="Mod4"/>
                <modifier name="Mod5"/>
            </set>
        </action>
    </rule>
    <rule>
        <condition>
            <keysym id="Scroll_Lock"/>
            <modifiersList predicate="any">
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="Control"/>
                <modifier name="Mod1"/>
                <modifier name="Mod2"/>
                <modifier name="Mod3"/>
                <modifier name="Mod4"/>
                <modifier name="Mod5"/>
            </modifiersList>
        </condition>
        <action>
            <lock changeType="modifiers">
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                <!--  flags: 4  -->
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="Control"/>
                <modifier name="Mod1"/>
                <modifier name="Mod2"/>
                <modifier name="Mod3"/>
                <modifier name="Mod4"/>
                <modifier name="Mod5"/>
            </lock>
        </action>
    </rule>
    <rule>
        <condition>
            <keysym id="(null)"/>
            <modifiersList predicate="any">
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="Control"/>
                <modifier name="Mod1"/>
                <modifier name="Mod2"/>
                <modifier name="Mod3"/>
                <modifier name="Mod4"/>
                <modifier name="Mod5"/>
            </modifiersList>
        </condition>
        <action>
            <set changeType="modifiers">
                <!--  flags: 1  -->
                <modifier name="LevelFive"/>
            </set>
        </action>
    </rule>
    <rule>
        <condition>
            <keysym id="(null)"/>
            <modifiersList predicate="any">
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="Control"/>
                <modifier name="Mod1"/>
                <modifier name="Mod2"/>
                <modifier name="Mod3"/>
                <modifier name="Mod4"/>
                <modifier name="Mod5"/>
            </modifiersList>
        </condition>
        <action>
            <latch changeType="modifiers">
                <!--  flags: 3  -->
                <modifier name="LevelFive"/>
            </latch>
        </action>
    </rule>
    <rule>
        <condition>
            <keysym id="(null)"/>
            <modifiersList predicate="any">
                <modifier name="Shift"/>
                <modifier name="Lock"/>
                <modifier name="Control"/>
```

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            <modifier name="Mod1"/>
            <modifier name="Mod2"/>
            <modifier name="Mod3"/>
            <modifier name="Mod4"/>
            <modifier name="Mod5"/>
        </modifiersList>
    </condition>
    <action>
        <lock changeType="modifiers">
            <!--  flags: 0  -->
            <modifier name="LevelFive"/>
        </lock>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="Mode_switch"/>
    </condition>
    <action>
        <set changeType="group" relative="true">
            1
        </set>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="ISO_Level3_Shift"/>
    </condition>
    <action>
        <set changeType="modifiers">
            <!--  flags: 1  -->
            <modifier name="LevelThree"/>
        </set>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="ISO_Level3_Latch"/>
    </condition>
    <action>
        <latch changeType="modifiers">
            <!--  flags: 3  -->
            <modifier name="LevelThree"/>
        </latch>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="ISO_Level3_Lock"/>
    </condition>
    <action>
        <lock changeType="modifiers">
            <!--  flags: 0  -->
            <modifier name="LevelThree"/>
        </lock>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="ISO_Group_Latch"/>
    </condition>
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
© ISO/IEC 2008 – All rights reserved
Not for Resale

```
    <action>
        <latch changeType="group" relative="false">
            1
        </latch>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="ISO_Next_Group"/>
    </condition>
    <action>
        <lock changeType="group" relative="true">
            1
        </lock>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="ISO_Prev_Group"/>
    </condition>
    <action>
        <lock changeType="group" relative="true">
            -1
        </lock>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="ISO_First_Group"/>
    </condition>
    <action>
        <lock changeType="group" relative="false">
            0
        </lock>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="ISO_Last_Group"/>
    </condition>
    <action>
        <lock changeType="group" relative="false">
            1
        </lock>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="Alt_L"/>
    </condition>
    <action>
        <set changeType="modifiers">
            <!--  flags: 1  -->
            <modifier name="Alt"/>
        </set>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="Alt_R"/>
    </condition>
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    <action>
        <set changeType="modifiers">
            <!--  flags: 1  -->
            <modifier name="Alt"/>
        </set>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="Meta_L"/>
    </condition>
    <action>
        <set changeType="modifiers">
            <!--  flags: 1  -->
            <modifier name="Meta"/>
        </set>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="Meta_R"/>
    </condition>
    <action>
        <set changeType="modifiers">
            <!--  flags: 1  -->
            <modifier name="Alt"/>
        </set>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="Super_L"/>
    </condition>
    <action>
        <set changeType="modifiers">
            <!--  flags: 1  -->
            <modifier name="Super"/>
        </set>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="Super_R"/>
    </condition>
    <action>
        <set changeType="modifiers">
            <!--  flags: 1  -->
            <modifier name="Super"/>
        </set>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="Hyper_L"/>
    </condition>
    <action>
        <set changeType="modifiers">
            <!--  flags: 1  -->
            <modifier name="Hyper"/>
        </set>
    </action>
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale
© ISO/IEC 2008 – All rights reserved

```
</rule>
<rule>
    <condition>
        <keysym id="Hyper_R"/>
    </condition>
    <action>
        <set changeType="modifiers">
            <!--  flags: 1  -->
            <modifier name="Hyper"/>
        </set>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="(null)"/>
    </condition>
    <action>
        <set changeType="modifiers">
            <!--  flags: 1  -->
            <modifier name="LevelFive"/>
        </set>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="(null)"/>
    </condition>
    <action>
        <latch changeType="modifiers">
            <!--  flags: 3  -->
            <modifier name="LevelFive"/>
        </latch>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="(null)"/>
    </condition>
    <action>
        <lock changeType="modifiers">
            <!--  flags: 0  -->
            <modifier name="LevelFive"/>
        </lock>
    </action>
</rule>
<rule>
    <condition>
        <keysym id="(null)"/>
        <modifiersList predicate="exactly">
            <modifier name="Lock"/>
        </modifiersList>
    </condition>
    <action>
        <lock changeType="modifiers">
            <!--  flags: 0  -->
            <modifier name="Lock"/>
        </lock>
    </action>
</rule>
<rule>
    <condition>
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                    <keysym id="(null)"/>
                    <modifiersList predicate="any">
                        <modifier name="Shift"/>
                        <modifier name="Lock"/>
                        <modifier name="Control"/>
                        <modifier name="Mod1"/>
                        <modifier name="Mod2"/>
                        <modifier name="Mod3"/>
                        <modifier name="Mod4"/>
                        <modifier name="Mod5"/>
                    </modifiersList>
                </condition>
                <action>
                    <set changeType="modifiers">
                        <!--  flags: 5  -->
                        <modifier name="Shift"/>
                        <modifier name="Lock"/>
                        <modifier name="Control"/>
                        <modifier name="Mod1"/>
                        <modifier name="Mod2"/>
                        <modifier name="Mod3"/>
                        <modifier name="Mod4"/>
                        <modifier name="Mod5"/>
                    </set>
                </action>
            </rule>
        </interpretation>
    </dictionaries>
    <meta>
        <countriesList>
        </countriesList>
        <languagesList>
        </languagesList>
    </meta>
    <nonFunctional>
        <geometry>
            <!--  description: [pc(pc104)]  -->
            <svg xmlns="http://www.iso.org/jtc1/sc35/wg1/iso24757" width="4700"
height="2100">
                <defs>
                    <linearGradient id="black">
                        <stop offset="0%" stop-color="#000000"/>
                        <stop offset="100%" stop-color="#000000"/>
                    </linearGradient>
                    <linearGradient id="white">
                        <stop offset="0%" stop-color="#ffffff"/>
                        <stop offset="100%" stop-color="#ffffff"/>
                    </linearGradient>
                    <linearGradient id="grey20">
                        <stop offset="0%" stop-color="#cccccc"/>
                        <stop offset="100%" stop-color="#cccccc"/>
                    </linearGradient>
                    <linearGradient id="grey10">
                        <stop offset="0%" stop-color="#e6e6e6"/>
                        <stop offset="100%" stop-color="#e6e6e6"/>
                    </linearGradient>
                    <linearGradient id="green">
                        <stop offset="0%" stop-color="#00ff00"/>
                        <stop offset="100%" stop-color="#00ff00"/>
                    </linearGradient>
                    <linearGradient id="green30">
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                        <stop offset="0%" stop-color="#00b300"/>
                        <stop offset="100%" stop-color="#00b300"/>
                    </linearGradient>
                </defs>
                <rect width="4700" height="2100" x="0" y="0" fill="url(#white)"
stroke="grey"/>
                <g transform="translate(3770,520)">
                    <rect width="750" height="200" x="0" y="0" rx="0" ry="0"
fill="url(#grey10)" stroke="grey"/>
                </g>
                <g transform="translate(3820,670)">
                    <g id="Num_Lock">
                        <rect width="50" height="10" x="0" y="0" rx="0" ry="0"
fill="url(#green30)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(4070,670)">
                    <g id="Caps_Lock">
                        <rect width="50" height="10" x="0" y="0" rx="0" ry="0"
fill="url(#green30)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(4330,670)">
                    <g id="Scroll_Lock">
                        <rect width="50" height="10" x="0" y="0" rx="0" ry="0"
fill="url(#green30)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3780,550)">
                    <text x="134601400" y="10" font-family="black" font-
size="134523628mm" fill="url(#defs)">Num
Lock</text>
                </g>
                <g transform="translate(4030,550)">
                    <text x="134601480" y="10" font-family="black" font-
size="134523628mm" fill="url(#defs)">Caps
Lock</text>
                </g>
                <g transform="translate(4280,550)">
                    <text x="134601560" y="10" font-family="black" font-
size="134523628mm" fill="url(#defs)">Scroll
Lock</text>
                </g>
                <g transform="translate(210,530)">
                    <g id="ESC">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(590,530)">
                    <g id="FK01">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(780,530)">
                    <g id="FK02">
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(970,530)">
                    <g id="FK03">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1160,530)">
                    <g id="FK04">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1450,530)">
                    <g id="FK05">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1640,530)">
                    <g id="FK06">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1830,530)">
                    <g id="FK07">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2020,530)">
                    <g id="FK08">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2310,530)">
                    <g id="FK09">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                </g>
                <g transform="translate(2500,530)">
                    <g id="FK10">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2690,530)">
                    <g id="FK11">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2880,530)">
                    <g id="FK12">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3140,530)">
                    <g id="PRSC">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3330,530)">
                    <g id="SCLK">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3520,530)">
                    <g id="PAUS">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(210,920)">
                    <g id="TLDE">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(400,920)">
                    <g id="AE01">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(590,920)">
                    <g id="AE02">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(780,920)">
                    <g id="AE03">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(970,920)">
                    <g id="AE04">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1160,920)">
                    <g id="AE05">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1350,920)">
                    <g id="AE06">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1540,920)">
                    <g id="AE07">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1730,920)">
                    <g id="AE08">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1920,920)">
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                    <g id="AE09">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2110,920)">
                    <g id="AE10">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2300,920)">
                    <g id="AE11">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2490,920)">
                    <g id="AE12">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2680,920)">
                    <g id="BKSP">
                        <rect width="380" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="340" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(210,1110)">
                    <g id="TAB">
                        <rect width="280" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="240" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(500,1110)">
                    <g id="AD01">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(690,1110)">
                    <g id="AD02">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
```

--`,,```,,,,````-`-`,,`,,`,`,,`---
© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                    </g>
                </g>
                <g transform="translate(880,1110)">
                    <g id="AD03">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1070,1110)">
                    <g id="AD04">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1260,1110)">
                    <g id="AD05">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1450,1110)">
                    <g id="AD06">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1640,1110)">
                    <g id="AD07">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1830,1110)">
                    <g id="AD08">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2020,1110)">
                    <g id="AD09">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2210,1110)">
                    <g id="AD10">
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
© ISO/IEC 2008 – All rights reserved
Not for Resale

```
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2400,1110)">
                    <g id="AD11">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2590,1110)">
                    <g id="AD12">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2780,1110)">
                    <g id="BKSL">
                        <rect width="280" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="240" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(210,1300)">
                    <g id="CAPS">
                        <rect width="330" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="290" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(550,1300)">
                    <g id="AC01">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(740,1300)">
                    <g id="AC02">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(930,1300)">
                    <g id="AC03">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                </g>
                <g transform="translate(1120,1300)">
                    <g id="AC04">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1310,1300)">
                    <g id="AC05">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1500,1300)">
                    <g id="AC06">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1690,1300)">
                    <g id="AC07">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1880,1300)">
                    <g id="AC08">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2070,1300)">
                    <g id="AC09">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2260,1300)">
                    <g id="AC10">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2450,1300)">
                    <g id="AC11">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2640,1300)">
                    <g id="RTRN">
                        <rect width="420" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="380" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(210,1490)">
                    <g id="LFSH">
                        <rect width="420" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="380" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(640,1490)">
                    <g id="AB01">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(830,1490)">
                    <g id="AB02">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1020,1490)">
                    <g id="AB03">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1210,1490)">
                    <g id="AB04">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1400,1490)">
                    <g id="AB05">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1590,1490)">
```

© ISO/IEC 2008 All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                    <g id="AB06">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1780,1490)">
                    <g id="AB07">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(1970,1490)">
                    <g id="AB08">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2160,1490)">
                    <g id="AB09">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2350,1490)">
                    <g id="AB10">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2540,1490)">
                    <g id="RTSH">
                        <rect width="520" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="480" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(210,1680)">
                    <g id="LCTL">
                        <rect width="270" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="230" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(490,1680)">
                    <g id="LWIN">
                        <rect width="230" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="190" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
```


Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
© ISO/IEC 2008 – All rights reserved
Not for Resale

```
                    </g>
                </g>
                <g transform="translate(730,1680)">
                    <g id="LALT">
                        <rect width="230" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="190" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(970,1680)">
                    <g id="SPCE">
                        <rect width="1130" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="1090" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2110,1680)">
                    <g id="RALT">
                        <rect width="230" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="190" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2350,1680)">
                    <g id="RWIN">
                        <rect width="230" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="190" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2590,1680)">
                    <g id="MENU">
                        <rect width="230" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="190" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(2830,1680)">
                    <g id="RCTL">
                        <rect width="230" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="190" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3140,920)">
                    <g id="INS">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3330,920)">
                    <g id="HOME">
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3520,920)">
                    <g id="PGUP">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3140,1110)">
                    <g id="DELE">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3330,1110)">
                    <g id="END">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3520,1110)">
                    <g id="PGDN">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3330,1490)">
                    <g id="UP">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3140,1680)">
                    <g id="LEFT">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3330,1680)">
                    <g id="DOWN">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                </g>
                <g transform="translate(3520,1680)">
                    <g id="RGHT">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3780,920)">
                    <g id="NMLK">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3970,920)">
                    <g id="KPDV">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(4160,920)">
                    <g id="KPMU">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(4350,920)">
                    <g id="KPSU">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3780,1110)">
                    <g id="KP7">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3970,1110)">
                    <g id="KP8">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(4160,1110)">
                    <g id="KP9">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(4350,1110)">
                    <g id="KPAD">
                        <rect width="180" height="370" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="140" height="340" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3780,1300)">
                    <g id="KP4">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3970,1300)">
                    <g id="KP5">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(4160,1300)">
                    <g id="KP6">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3780,1490)">
                    <g id="KP1">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3970,1490)">
                    <g id="KP2">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(4160,1490)">
                    <g id="KP3">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(4350,1490)">
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                    <g id="KPEN">
                        <rect width="180" height="370" x="0" y="0" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                        <rect width="140" height="340" x="20" y="10" rx="10"
ry="10" fill="url(#grey20)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(3780,1680)">
                    <g id="KP0">
                        <rect width="370" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="330" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
                <g transform="translate(4160,1680)">
                    <g id="KPDL">
                        <rect width="180" height="180" x="0" y="0" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                        <rect width="140" height="150" x="20" y="10" rx="10"
ry="10" fill="url(#white)" stroke="grey"/>
                    </g>
                </g>
            </svg>
        </geometry>
    </nonFunctional>
    <functional>
        <groupList>
            <group name="U.S. English"/>
            <group name="Russia - Winkeys"/>
        </groupList>
        <keyList>
            <key scancode="9" keycode="ESC">
                <group type="ONE_LEVEL">
                    <shiftLevel>
                        <symbol><![CDATA[Escape]]></symbol>
                        <!--  XkbTranslateKeySym: [_]  -->
                    </shiftLevel>
                </group>
            </key>
            <key scancode="10" keycode="AE01">
                <group type="TWO_LEVEL">
                    <shiftLevel>
                        <symbol><![CDATA[1]]></symbol>
                        <!--  keysym2string: [1]  -->
                    </shiftLevel>
                    <shiftLevel>
                        <symbol><![CDATA[!]]></symbol>
                        <!--  keysym2string: [exclam]  -->
                    </shiftLevel>
                </group>
            </key>
            <key scancode="11" keycode="AE02">
                <group type="TWO_LEVEL">
                    <shiftLevel>
                        <symbol><![CDATA[2]]></symbol>
                        <!--  keysym2string: [2]  -->
                    </shiftLevel>
                    <shiftLevel>
                        <symbol><![CDATA[@]]></symbol>
                        <!--  keysym2string: [at]  -->
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            </shiftLevel>
        </group>
        <group type="TWO_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[2]]></symbol>
                <!--  keysym2string: [2]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA["]]></symbol>
                <!--  keysym2string: [quotedbl]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="12" keycode="AE03">
        <group type="TWO_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[3]]></symbol>
                <!--  keysym2string: [3]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[#]]></symbol>
                <!--  keysym2string: [numbersign]  -->
            </shiftLevel>
        </group>
        <group type="TWO_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[3]]></symbol>
                <!--  keysym2string: [3]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[â„-]]></symbol>
                <!--  keysym2string: [numerosign]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="13" keycode="AE04">
        <group type="TWO_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[4]]></symbol>
                <!--  keysym2string: [4]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[$]]></symbol>
                <!--  keysym2string: [dollar]  -->
            </shiftLevel>
        </group>
        <group type="TWO_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[4]]></symbol>
                <!--  keysym2string: [4]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[;]]></symbol>
                <!--  keysym2string: [semicolon]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="14" keycode="AE05">
        <group type="TWO_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[5]]></symbol>
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            <!--  keysym2string: [5]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[%]]></symbol>
            <!--  keysym2string: [percent]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="15" keycode="AE06">
    <group type="TWO_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[6]]></symbol>
            <!--  keysym2string: [6]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[^]]></symbol>
            <!--  keysym2string: [asciicircum]  -->
        </shiftLevel>
    </group>
    <group type="TWO_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[6]]></symbol>
            <!--  keysym2string: [6]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[:]]></symbol>
            <!--  keysym2string: [colon]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="16" keycode="AE07">
    <group type="TWO_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[7]]></symbol>
            <!--  keysym2string: [7]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[&]]></symbol>
            <!--  keysym2string: [ampersand]  -->
        </shiftLevel>
    </group>
    <group type="TWO_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[7]]></symbol>
            <!--  keysym2string: [7]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[?]]></symbol>
            <!--  keysym2string: [question]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="17" keycode="AE08">
    <group type="TWO_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[8]]></symbol>
            <!--  keysym2string: [8]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[*]]></symbol>
            <!--  keysym2string: [asterisk]  -->
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            </shiftLevel>
        </group>
    </key>
    <key scancode="18" keycode="AE09">
        <group type="TWO_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[9]]></symbol>
                <!--  keysym2string: [9]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[(]]></symbol>
                <!--  keysym2string: [parenleft]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="19" keycode="AE10">
        <group type="TWO_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[0]]></symbol>
                <!--  keysym2string: [0]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[)]]></symbol>
                <!--  keysym2string: [parenright]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="20" keycode="AE11">
        <group type="TWO_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[-]]></symbol>
                <!--  keysym2string: [minus]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[_]]></symbol>
                <!--  keysym2string: [underscore]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="21" keycode="AE12">
        <group type="TWO_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[=]]></symbol>
                <!--  keysym2string: [equal]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[+]]></symbol>
                <!--  keysym2string: [plus]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="22" keycode="BKSP">
        <group type="CTRL+ALT">
            <shiftLevel>
                <symbol><![CDATA[BackSpace]]></symbol>
                <!--  XkbTranslateKeySym: [_]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Terminate_Server]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    </group>
</key>
<key scancode="23" keycode="TAB">
    <group type="TWO_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[Tab]]></symbol>
            <!--  XkbTranslateKeySym: [   ]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[ISO_Left_Tab]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="24" keycode="AD01">
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[q]]></symbol>
            <!--  keysym2string: [q]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Q]]></symbol>
            <!--  keysym2string: [Q]  -->
        </shiftLevel>
    </group>
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[Ð¹]]></symbol>
            <!--  keysym2string: [Cyrillic_shorti]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Ð™]]></symbol>
            <!--  keysym2string: [Cyrillic_SHORTI]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="25" keycode="AD02">
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[w]]></symbol>
            <!--  keysym2string: [w]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[W]]></symbol>
            <!--  keysym2string: [W]  -->
        </shiftLevel>
    </group>
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[Ñ†]]></symbol>
            <!--  keysym2string: [Cyrillic_tse]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Ð¦]]></symbol>
            <!--  keysym2string: [Cyrillic_TSE]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="26" keycode="AD03">
    <group type="ALPHABETIC">
        <shiftLevel>
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                <symbol><![CDATA[e]]></symbol>
                <!--  keysym2string: [e]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[E]]></symbol>
                <!--  keysym2string: [E]  -->
            </shiftLevel>
        </group>
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[Ñƒ]]></symbol>
                <!--  keysym2string: [Cyrillic_u]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Ð£]]></symbol>
                <!--  keysym2string: [Cyrillic_U]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="27" keycode="AD04">
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[r]]></symbol>
                <!--  keysym2string: [r]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[R]]></symbol>
                <!--  keysym2string: [R]  -->
            </shiftLevel>
        </group>
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[Ð°]]></symbol>
                <!--  keysym2string: [Cyrillic_ka]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Ðš]]></symbol>
                <!--  keysym2string: [Cyrillic_KA]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="28" keycode="AD05">
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[t]]></symbol>
                <!--  keysym2string: [t]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[T]]></symbol>
                <!--  keysym2string: [T]  -->
            </shiftLevel>
        </group>
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[Ðµ]]></symbol>
                <!--  keysym2string: [Cyrillic_ie]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Ð•]]></symbol>
                <!--  keysym2string: [Cyrillic_IE]  -->
            </shiftLevel>
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    </group>
</key>
<key scancode="29" keycode="AD06">
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[y]]></symbol>
            <!--  keysym2string: [y]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Y]]></symbol>
            <!--  keysym2string: [Y]  -->
        </shiftLevel>
    </group>
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[Ð½]]></symbol>
            <!--  keysym2string: [Cyrillic_en]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Ð□]]></symbol>
            <!--  keysym2string: [Cyrillic_EN]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="30" keycode="AD07">
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[u]]></symbol>
            <!--  keysym2string: [u]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[U]]></symbol>
            <!--  keysym2string: [U]  -->
        </shiftLevel>
    </group>
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[Ð³]]></symbol>
            <!--  keysym2string: [Cyrillic_ghe]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Ð‟]]></symbol>
            <!--  keysym2string: [Cyrillic_GHE]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="31" keycode="AD08">
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[i]]></symbol>
            <!--  keysym2string: [i]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[I]]></symbol>
            <!--  keysym2string: [I]  -->
        </shiftLevel>
    </group>
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[Ñˆ]]></symbol>
            <!--  keysym2string: [Cyrillic_sha]  -->
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Ð¨]]></symbol>
                <!--  keysym2string: [Cyrillic_SHA]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="32" keycode="AD09">
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[o]]></symbol>
                <!--  keysym2string: [o]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[O]]></symbol>
                <!--  keysym2string: [O]  -->
            </shiftLevel>
        </group>
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[Ñ‰]]></symbol>
                <!--  keysym2string: [Cyrillic_shcha]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Ð©]]></symbol>
                <!--  keysym2string: [Cyrillic_SHCHA]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="33" keycode="AD10">
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[p]]></symbol>
                <!--  keysym2string: [p]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[P]]></symbol>
                <!--  keysym2string: [P]  -->
            </shiftLevel>
        </group>
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[Ð·]]></symbol>
                <!--  keysym2string: [Cyrillic_ze]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Ð—]]></symbol>
                <!--  keysym2string: [Cyrillic_ZE]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="34" keycode="AD11">
        <group type="TWO_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[[]]></symbol>
                <!--  keysym2string: [bracketleft]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[{]]></symbol>
                <!--  keysym2string: [braceleft]  -->
            </shiftLevel>
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                </group>
                <group type="ALPHABETIC">
                    <shiftLevel>
                        <symbol><![CDATA[Ñ…]]></symbol>
                        <!--  keysym2string: [Cyrillic_ha]  -->
                    </shiftLevel>
                    <shiftLevel>
                        <symbol><![CDATA[Ð¥]]></symbol>
                        <!--  keysym2string: [Cyrillic_HA]  -->
                    </shiftLevel>
                </group>
            </key>
            <key scancode="35" keycode="AD12">
                <group type="TWO_LEVEL">
                    <shiftLevel>
                        <symbol><![CDATA[]]]></symbol>
                        <!--  keysym2string: [bracketright]  -->
                    </shiftLevel>
                    <shiftLevel>
                        <symbol><![CDATA[}]]></symbol>
                        <!--  keysym2string: [braceright]  -->
                    </shiftLevel>
                </group>
                <group type="ALPHABETIC">
                    <shiftLevel>
                        <symbol><![CDATA[ÑŠ]]></symbol>
                        <!--  keysym2string: [Cyrillic_hardsign]  -->
                    </shiftLevel>
                    <shiftLevel>
                        <symbol><![CDATA[Ðª]]></symbol>
                        <!--  keysym2string: [Cyrillic_HARDSIGN]  -->
                    </shiftLevel>
                </group>
            </key>
            <key scancode="36" keycode="RTRN">
                <group type="ONE_LEVEL">
                    <shiftLevel>
                        <symbol><![CDATA[Return]]></symbol>
                        <!--  XkbTranslateKeySym: [
]  -->
                    </shiftLevel>
                </group>
            </key>
            <key scancode="37" keycode="LCTL">
                <group type="ONE_LEVEL">
                    <shiftLevel>
                        <symbol><![CDATA[Control_L]]></symbol>
                        <!--  XkbTranslateKeySym: []  -->
                    </shiftLevel>
                </group>
            </key>
            <key scancode="38" keycode="AC01">
                <group type="ALPHABETIC">
                    <shiftLevel>
                        <symbol><![CDATA[a]]></symbol>
                        <!--  keysym2string: [a]  -->
                    </shiftLevel>
                    <shiftLevel>
                        <symbol><![CDATA[A]]></symbol>
                        <!--  keysym2string: [A]  -->
                    </shiftLevel>
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        </group>
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[Ñ„]]></symbol>
                <!--  keysym2string: [Cyrillic_ef]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Ð¤]]></symbol>
                <!--  keysym2string: [Cyrillic_EF]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="39" keycode="AC02">
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[s]]></symbol>
                <!--  keysym2string: [s]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[S]]></symbol>
                <!--  keysym2string: [S]  -->
            </shiftLevel>
        </group>
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[Ñ‹]]></symbol>
                <!--  keysym2string: [Cyrillic_yeru]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Ð«]]></symbol>
                <!--  keysym2string: [Cyrillic_YERU]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="40" keycode="AC03">
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[d]]></symbol>
                <!--  keysym2string: [d]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[D]]></symbol>
                <!--  keysym2string: [D]  -->
            </shiftLevel>
        </group>
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[Ð²]]></symbol>
                <!--  keysym2string: [Cyrillic_ve]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Ð’]]></symbol>
                <!--  keysym2string: [Cyrillic_VE]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="41" keycode="AC04">
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[f]]></symbol>
                <!--  keysym2string: [f]  -->
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[F]]></symbol>
                <!--  keysym2string: [F]  -->
            </shiftLevel>
        </group>
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[Ð°]]></symbol>
                <!--  keysym2string: [Cyrillic_a]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Ð□]]></symbol>
                <!--  keysym2string: [Cyrillic_A]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="42" keycode="AC05">
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[g]]></symbol>
                <!--  keysym2string: [g]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[G]]></symbol>
                <!--  keysym2string: [G]  -->
            </shiftLevel>
        </group>
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[Ð¿]]></symbol>
                <!--  keysym2string: [Cyrillic_pe]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[ÐŸ]]></symbol>
                <!--  keysym2string: [Cyrillic_PE]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="43" keycode="AC06">
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[h]]></symbol>
                <!--  keysym2string: [h]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[H]]></symbol>
                <!--  keysym2string: [H]  -->
            </shiftLevel>
        </group>
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[Ñ€]]></symbol>
                <!--  keysym2string: [Cyrillic_er]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Ð ]]></symbol>
                <!--  keysym2string: [Cyrillic_ER]  -->
            </shiftLevel>
        </group>
    </key>
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
<key scancode="44" keycode="AC07">
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[j]]></symbol>
            <!--  keysym2string: [j]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[J]]></symbol>
            <!--  keysym2string: [J]  -->
        </shiftLevel>
    </group>
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[Ð¾]]></symbol>
            <!--  keysym2string: [Cyrillic_o]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Ðž]]></symbol>
            <!--  keysym2string: [Cyrillic_O]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="45" keycode="AC08">
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[k]]></symbol>
            <!--  keysym2string: [k]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[K]]></symbol>
            <!--  keysym2string: [K]  -->
        </shiftLevel>
    </group>
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[Ð»]]></symbol>
            <!--  keysym2string: [Cyrillic_el]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Ð›]]></symbol>
            <!--  keysym2string: [Cyrillic_EL]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="46" keycode="AC09">
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[l]]></symbol>
            <!--  keysym2string: [l]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[L]]></symbol>
            <!--  keysym2string: [L]  -->
        </shiftLevel>
    </group>
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[Ð´]]></symbol>
            <!--  keysym2string: [Cyrillic_de]  -->
        </shiftLevel>
        <shiftLevel>
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            <symbol><![CDATA[Ð”]]></symbol>
            <!--  keysym2string: [Cyrillic_DE]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="47" keycode="AC10">
    <group type="TWO_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[;]]></symbol>
            <!--  keysym2string: [semicolon]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[:]]></symbol>
            <!--  keysym2string: [colon]  -->
        </shiftLevel>
    </group>
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[Ð¶]]></symbol>
            <!--  keysym2string: [Cyrillic_zhe]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Ð-]]></symbol>
            <!--  keysym2string: [Cyrillic_ZHE]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="48" keycode="AC11">
    <group type="TWO_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[']]></symbol>
            <!--  keysym2string: [apostrophe]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA["]]></symbol>
            <!--  keysym2string: [quotedbl]  -->
        </shiftLevel>
    </group>
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[Ñ□]]></symbol>
            <!--  keysym2string: [Cyrillic_e]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Ð]]></symbol>
            <!--  keysym2string: [Cyrillic_E]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="49" keycode="TLDE">
    <group type="TWO_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[`]]></symbol>
            <!--  keysym2string: [grave]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[~]]></symbol>
            <!--  keysym2string: [asciitilde]  -->
        </shiftLevel>
    </group>
    <group type="ALPHABETIC">
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            <shiftLevel>
                <symbol><![CDATA[Ñ‘]]></symbol>
                <!--  keysym2string: [Cyrillic_io]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Ð□]]></symbol>
                <!--  keysym2string: [Cyrillic_IO]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="50" keycode="LFSH">
        <group type="ONE_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[Shift_L]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="51" keycode="BKSL">
        <group type="TWO_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[\]]></symbol>
                <!--  keysym2string: [backslash]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[|]]></symbol>
                <!--  keysym2string: [bar]  -->
            </shiftLevel>
        </group>
        <group type="TWO_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[\]]></symbol>
                <!--  keysym2string: [backslash]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[/]]></symbol>
                <!--  keysym2string: [slash]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="52" keycode="AB01">
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[z]]></symbol>
                <!--  keysym2string: [z]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Z]]></symbol>
                <!--  keysym2string: [Z]  -->
            </shiftLevel>
        </group>
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[Ñ□]]></symbol>
                <!--  keysym2string: [Cyrillic_ya]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Ð¯]]></symbol>
                <!--  keysym2string: [Cyrillic_YA]  -->
            </shiftLevel>
        </group>
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
</key>
<key scancode="53" keycode="AB02">
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[x]]></symbol>
            <!--  keysym2string: [x]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[X]]></symbol>
            <!--  keysym2string: [X]  -->
        </shiftLevel>
    </group>
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[Ñ‡]]></symbol>
            <!--  keysym2string: [Cyrillic_che]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Ð§]]></symbol>
            <!--  keysym2string: [Cyrillic_CHE]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="54" keycode="AB03">
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[c]]></symbol>
            <!--  keysym2string: [c]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[C]]></symbol>
            <!--  keysym2string: [C]  -->
        </shiftLevel>
    </group>
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[Ñ□]]></symbol>
            <!--  keysym2string: [Cyrillic_es]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Ð¡]]></symbol>
            <!--  keysym2string: [Cyrillic_ES]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="55" keycode="AB04">
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[v]]></symbol>
            <!--  keysym2string: [v]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[V]]></symbol>
            <!--  keysym2string: [V]  -->
        </shiftLevel>
    </group>
    <group type="ALPHABETIC">
        <shiftLevel>
            <symbol><![CDATA[Ð¼]]></symbol>
            <!--  keysym2string: [Cyrillic_em]  -->
        </shiftLevel>
```

© ISO/IEC 2008 All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            <shiftLevel>
                <symbol><![CDATA[Ðœ]]></symbol>
                <!--  keysym2string: [Cyrillic_EM]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="56" keycode="AB05">
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[b]]></symbol>
                <!--  keysym2string: [b]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[B]]></symbol>
                <!--  keysym2string: [B]  -->
            </shiftLevel>
        </group>
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[Ð¸]]></symbol>
                <!--  keysym2string: [Cyrillic_i]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Ð˜]]></symbol>
                <!--  keysym2string: [Cyrillic_I]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="57" keycode="AB06">
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[n]]></symbol>
                <!--  keysym2string: [n]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[N]]></symbol>
                <!--  keysym2string: [N]  -->
            </shiftLevel>
        </group>
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[Ñ,]]></symbol>
                <!--  keysym2string: [Cyrillic_te]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Ð¢]]></symbol>
                <!--  keysym2string: [Cyrillic_TE]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="58" keycode="AB07">
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[m]]></symbol>
                <!--  keysym2string: [m]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[M]]></symbol>
                <!--  keysym2string: [M]  -->
            </shiftLevel>
        </group>
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[ÑŒ]]></symbol>
                <!--  keysym2string: [Cyrillic_softsign]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Ð¬]]></symbol>
                <!--  keysym2string: [Cyrillic_SOFTSIGN]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="59" keycode="AB08">
        <group type="TWO_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[,]]></symbol>
                <!--  keysym2string: [comma]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[<]]></symbol>
                <!--  keysym2string: [less]  -->
            </shiftLevel>
        </group>
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[Ð±]]></symbol>
                <!--  keysym2string: [Cyrillic_be]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Ð‘]]></symbol>
                <!--  keysym2string: [Cyrillic_BE]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="60" keycode="AB09">
        <group type="TWO_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[.]]></symbol>
                <!--  keysym2string: [period]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[>]]></symbol>
                <!--  keysym2string: [greater]  -->
            </shiftLevel>
        </group>
        <group type="ALPHABETIC">
            <shiftLevel>
                <symbol><![CDATA[ÑŽ]]></symbol>
                <!--  keysym2string: [Cyrillic_yu]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Ð®]]></symbol>
                <!--  keysym2string: [Cyrillic_YU]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="61" keycode="AB10">
        <group type="TWO_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[/]]></symbol>
                <!--  keysym2string: [slash]  -->
            </shiftLevel>
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            <shiftLevel>
                <symbol><![CDATA[?]]></symbol>
                <!--  keysym2string: [question]  -->
            </shiftLevel>
        </group>
        <group type="TWO_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[.]]></symbol>
                <!--  keysym2string: [period]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[,]]></symbol>
                <!--  keysym2string: [comma]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="62" keycode="RTSH">
        <group type="ONE_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[Shift_R]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="63" keycode="KPMU">
        <group type="CTRL+ALT">
            <shiftLevel>
                <symbol><![CDATA[*]]></symbol>
                <!--  keysym2string: [KP_Multiply]  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[XF86_ClearGrab]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="64" keycode="LALT">
        <group type="TWO_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[Alt_L]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[Meta_L]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="65" keycode="SPCE">
        <group type="ONE_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[ ]]></symbol>
                <!--  keysym2string: [space]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="66" keycode="CAPS">
        <group type="ONE_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[Caps_Lock]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            </shiftLevel>
        </group>
    </key>
    <key scancode="67" keycode="FK01">
        <group type="CTRL+ALT">
            <shiftLevel>
                <symbol><![CDATA[F1]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[XF86_Switch_VT_1]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="68" keycode="FK02">
        <group type="CTRL+ALT">
            <shiftLevel>
                <symbol><![CDATA[F2]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[XF86_Switch_VT_2]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="69" keycode="FK03">
        <group type="CTRL+ALT">
            <shiftLevel>
                <symbol><![CDATA[F3]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[XF86_Switch_VT_3]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="70" keycode="FK04">
        <group type="CTRL+ALT">
            <shiftLevel>
                <symbol><![CDATA[F4]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[XF86_Switch_VT_4]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="71" keycode="FK05">
        <group type="CTRL+ALT">
            <shiftLevel>
                <symbol><![CDATA[F5]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[XF86_Switch_VT_5]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    </group>
</key>
<key scancode="72" keycode="FK06">
    <group type="CTRL+ALT">
        <shiftLevel>
            <symbol><![CDATA[F6]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[XF86_Switch_VT_6]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="73" keycode="FK07">
    <group type="CTRL+ALT">
        <shiftLevel>
            <symbol><![CDATA[F7]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[XF86_Switch_VT_7]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="74" keycode="FK08">
    <group type="CTRL+ALT">
        <shiftLevel>
            <symbol><![CDATA[F8]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[XF86_Switch_VT_8]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="75" keycode="FK09">
    <group type="CTRL+ALT">
        <shiftLevel>
            <symbol><![CDATA[F9]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[XF86_Switch_VT_9]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="76" keycode="FK10">
    <group type="CTRL+ALT">
        <shiftLevel>
            <symbol><![CDATA[F10]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[XF86_Switch_VT_10]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
```


--`,,```,,,,````-`-`,,`,,`,`,,`---
© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
</key>
<key scancode="77" keycode="NMLK">
    <group type="TWO_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[Num_Lock]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Pointer_EnableKeys]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="78" keycode="SCLK">
    <group type="ONE_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[Scroll_Lock]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="79" keycode="KP7">
    <group type="KEYPAD">
        <shiftLevel>
            <symbol><![CDATA[KP_Home]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[7]]></symbol>
            <!--  keysym2string: [KP_7]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="80" keycode="KP8">
    <group type="KEYPAD">
        <shiftLevel>
            <symbol><![CDATA[KP_Up]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[8]]></symbol>
            <!--  keysym2string: [KP_8]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="81" keycode="KP9">
    <group type="KEYPAD">
        <shiftLevel>
            <symbol><![CDATA[KP_Prior]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[9]]></symbol>
            <!--  keysym2string: [KP_9]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="82" keycode="KPSU">
    <group type="CTRL+ALT">
        <shiftLevel>
            <symbol><![CDATA[-]]></symbol>
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            <!--  keysym2string: [KP_Subtract]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[XF86_Prev_VMode]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="83" keycode="KP4">
    <group type="KEYPAD">
        <shiftLevel>
            <symbol><![CDATA[KP_Left]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[4]]></symbol>
            <!--  keysym2string: [KP_4]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="84" keycode="KP5">
    <group type="KEYPAD">
        <shiftLevel>
            <symbol><![CDATA[KP_Begin]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[5]]></symbol>
            <!--  keysym2string: [KP_5]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="85" keycode="KP6">
    <group type="KEYPAD">
        <shiftLevel>
            <symbol><![CDATA[KP_Right]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[6]]></symbol>
            <!--  keysym2string: [KP_6]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="86" keycode="KPAD">
    <group type="CTRL+ALT">
        <shiftLevel>
            <symbol><![CDATA[+]]></symbol>
            <!--  keysym2string: [KP_Add]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[XF86_Next_VMode]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="87" keycode="KP1">
    <group type="KEYPAD">
        <shiftLevel>
            <symbol><![CDATA[KP_End]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[1]]></symbol>
                <!--  keysym2string: [KP_1]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="88" keycode="KP2">
        <group type="KEYPAD">
            <shiftLevel>
                <symbol><![CDATA[KP_Down]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[2]]></symbol>
                <!--  keysym2string: [KP_2]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="89" keycode="KP3">
        <group type="KEYPAD">
            <shiftLevel>
                <symbol><![CDATA[KP_Next]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[3]]></symbol>
                <!--  keysym2string: [KP_3]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="90" keycode="KP0">
        <group type="KEYPAD">
            <shiftLevel>
                <symbol><![CDATA[KP_Insert]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[0]]></symbol>
                <!--  keysym2string: [KP_0]  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="91" keycode="KPDL">
        <group type="KEYPAD">
            <shiftLevel>
                <symbol><![CDATA[KP_Delete]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[.]]></symbol>
                <!--  keysym2string: [KP_Decimal]  -->
            </shiftLevel>
        </group>
        <group type="KEYPAD">
            <shiftLevel>
                <symbol><![CDATA[KP_Delete]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
            <shiftLevel>
                <symbol><![CDATA[,]]></symbol>
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            <!--  keysym2string: [KP_Separator]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="93" keycode="MDSW">
    <group type="ONE_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[Mode_switch]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="94" keycode="LSGT">
    <group type="FOUR_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[<]]></symbol>
            <!--  keysym2string: [less]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[>]]></symbol>
            <!--  keysym2string: [greater]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[|]]></symbol>
            <!--  keysym2string: [bar]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Â¦]]></symbol>
            <!--  keysym2string: [brokenbar]  -->
        </shiftLevel>
    </group>
    <group type="TWO_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[/]]></symbol>
            <!--  keysym2string: [slash]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[|]]></symbol>
            <!--  keysym2string: [bar]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="95" keycode="FK11">
    <group type="CTRL+ALT">
        <shiftLevel>
            <symbol><![CDATA[F11]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[XF86_Switch_VT_11]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
</key>
<key scancode="96" keycode="FK12">
    <group type="CTRL+ALT">
        <shiftLevel>
            <symbol><![CDATA[F12]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[XF86_Switch_VT_12]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="97" keycode="HOME">
    <group type="ONE_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[Home]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="98" keycode="UP">
    <group type="ONE_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[Up]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="99" keycode="PGUP">
    <group type="ONE_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[Prior]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="100" keycode="LEFT">
    <group type="ONE_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[Left]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="102" keycode="RGHT">
    <group type="ONE_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[Right]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="103" keycode="END">
    <group type="ONE_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[End]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            <key scancode="104" keycode="DOWN">
                <group type="ONE_LEVEL">
                    <shiftLevel>
                        <symbol><![CDATA[Down]]></symbol>
                        <!--  XkbTranslateKeySym: []  -->
                    </shiftLevel>
                </group>
            </key>
            <key scancode="105" keycode="PGDN">
                <group type="ONE_LEVEL">
                    <shiftLevel>
                        <symbol><![CDATA[Next]]></symbol>
                        <!--  XkbTranslateKeySym: []  -->
                    </shiftLevel>
                </group>
            </key>
            <key scancode="106" keycode="INS">
                <group type="ONE_LEVEL">
                    <shiftLevel>
                        <symbol><![CDATA[Insert]]></symbol>
                        <!--  XkbTranslateKeySym: []  -->
                    </shiftLevel>
                </group>
            </key>
            <key scancode="107" keycode="DELE">
                <group type="ONE_LEVEL">
                    <shiftLevel>
                        <symbol><![CDATA[Delete]]></symbol>
                        <!--  XkbTranslateKeySym: [□]  -->
                    </shiftLevel>
                </group>
            </key>
            <key scancode="108" keycode="KPEN">
                <group type="ONE_LEVEL">
                    <shiftLevel>
                        <symbol><![CDATA[KP_Enter]]></symbol>
                        <!--  XkbTranslateKeySym: [
]  -->
                    </shiftLevel>
                </group>
            </key>
            <key scancode="109" keycode="RCTL">
                <group type="ONE_LEVEL">
                    <shiftLevel>
                        <symbol><![CDATA[ISO_Next_Group]]></symbol>
                        <!--  XkbTranslateKeySym: []  -->
                    </shiftLevel>
                </group>
            </key>
            <key scancode="110" keycode="PAUS">
                <group type="PC_BREAK">
                    <shiftLevel>
                        <symbol><![CDATA[Pause]]></symbol>
                        <!--  XkbTranslateKeySym: []  -->
                    </shiftLevel>
                    <shiftLevel>
                        <symbol><![CDATA[Break]]></symbol>
                        <!--  XkbTranslateKeySym: []  -->
                    </shiftLevel>
                </group>
            </key>
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
<key scancode="111" keycode="PRSC">
    <group type="PC_SYSRQ">
        <shiftLevel>
            <symbol><![CDATA[Print]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Sys_Req]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="112" keycode="KPDV">
    <group type="CTRL+ALT">
        <shiftLevel>
            <symbol><![CDATA[/]]></symbol>
            <!--  keysym2string: [KP_Divide]  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[XF86_Ungrab]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="113" keycode="RALT">
    <group type="TWO_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[Alt_R]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Meta_R]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="115" keycode="LWIN">
    <group type="ONE_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[Super_L]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="116" keycode="RWIN">
    <group type="ONE_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[Super_R]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="117" keycode="MENU">
    <group type="ONE_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[Menu]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
```

© ISO/IEC 2008 – All rights reserved
--`,,```,,,,````-`-`,,`,,`,`,,`---
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        </shiftLevel>
    </group>
</key>
<key scancode="124" keycode="LVL3">
    <group type="ONE_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[ISO_Level3_Shift]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="125" keycode="ALT">
    <group type="TWO_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Alt_L]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="126" keycode="KPEQ">
    <group type="ONE_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[=]]></symbol>
            <!--  keysym2string: [KP_Equal]  -->
        </shiftLevel>
    </group>
</key>
<key scancode="127" keycode="SUPR">
    <group type="TWO_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Super_L]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="128" keycode="HYPR">
    <group type="TWO_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
        <shiftLevel>
            <symbol><![CDATA[Hyper_L]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
    </group>
</key>
<key scancode="156" keycode="META">
    <group type="TWO_LEVEL">
        <shiftLevel>
            <symbol><![CDATA[]]></symbol>
            <!--  XkbTranslateKeySym: []  -->
        </shiftLevel>
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            <shiftLevel>
                <symbol><![CDATA[Meta_L]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="160" keycode="I20">
        <group type="ONE_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[XF86AudioMute]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="162" keycode="I22">
        <group type="ONE_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[XF86AudioPause]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="174" keycode="I2E">
        <group type="ONE_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[XF86AudioLowerVolume]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="176" keycode="I30">
        <group type="ONE_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[XF86AudioRaiseVolume]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="178" keycode="I32">
        <group type="ONE_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[XF86WWW]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
        </group>
    </key>
    <key scancode="236" keycode="I6C">
        <group type="ONE_LEVEL">
            <shiftLevel>
                <symbol><![CDATA[XF86Mail]]></symbol>
                <!--  XkbTranslateKeySym: []  -->
            </shiftLevel>
        </group>
    </key>
</keyList>
<indicatorsList>
    <indicator name="Caps_Lock">
        <reflectedModifiers>
            <use which="locked"/>
            <modifier name="Lock"/>
        </reflectedModifiers>
```

© ISO/IEC 2008 All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            </indicator>
            <indicator name="Num_Lock">
                <reflectedModifiers>
                    <use which="locked"/>
                    <modifier name="NumLock"/>
                </reflectedModifiers>
            </indicator>
            <indicator name="Scroll_Lock">
                <reflectedModifiers>
                    <use which="locked"/>
                    <modifier name="ScrollLock"/>
                </reflectedModifiers>
            </indicator>
        </indicatorsList>
    </functional>
</keyboard>
```

D.2.4 Program to convert xkb descriptions to ISO/IEC 24757 format

The following program written in the programming language C can convert via the use of X API's the running keyboard in X for the X Window system to the format defined in this International Standard. It was used to transform the data of Annex E.2.2 to the data in annex E.2.3. The X keyboard is described via APIs in http://www.xfree86.org/current/XKBlib.pdf .

```
/**
  $Id: xkb2iso.c 8 2007-03-01 20:03:28Z svu $
  Copyright (c) 2006, 2007 Sergey V. Udaltsov

  Permission is hereby granted, free of charge, to any person
  obtaining a copy of this software and associated documentation
  files (the "Software"), to deal in the Software without
  restriction, including without limitation the rights to use,
  copy, modify, merge, publish, distribute, sublicense, and/or sell
  copies of the Software, and to permit persons to whom the
  Software is furnished to do so, subject to the following
  conditions:

  The above copyright notice and this permission notice shall be
  included in all copies or substantial portions of the Software.

  THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND,
  EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES
  OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND
  NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT
  HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY,
  WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING
  FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR
  OTHER DEALINGS IN THE SOFTWARE.
*/

#include <ctype.h>
#include <locale.h>
#include <math.h>
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <stdarg.h>

#include <X11/XKBlib.h>
#include <X11/extensions/XKBgeom.h>
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
#define INDENT_STEP 4
#define ISO_KB_NAMESPACE "http://www.open-std.org/jtc1/sc35/wg1/iso24757"

static int indent = 0;

const char *real_mods[] = { "Shift", "Lock", "Control",
    "Mod1", "Mod2", "Mod3", "Mod4", "Mod5"
};

static void
xml_comment(const char *fmt, ...)
{
    va_list params;
    printf("%*s<!--  ", indent, "");
    va_start(params, fmt);
    vprintf(fmt, params);
    va_end(params);
    printf("  -->\n");
}

static void
xml_tag_open(const char *tag)
{
    printf("%*s<%s>\n", indent, "", tag);
    indent += INDENT_STEP;
}

static void
xml_tag_open_attr(const char *tag, const char *attr_fmt, ...)
{
    va_list attr_params;
    printf("%*s<%s ", indent, "", tag);
    va_start(attr_params, attr_fmt);
    vprintf(attr_fmt, attr_params);
    va_end(attr_params);
    printf(">\n");
    indent += INDENT_STEP;
}

static void
xml_data(const char *fmt, ...)
{
    va_list params;
    printf("%*s", indent, "");
    va_start(params, fmt);
    vprintf(fmt, params);
    va_end(params);
    printf("\n");
}

static void
xml_tag_close(const char *tag)
{
    indent -= INDENT_STEP;
    printf("%*s</%s>\n", indent, "", tag);
}



static void
```

© ISO/IEC 2008 All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
xml_tag_simple(const char *tag, const char *text)
{
   printf("%*s<%s><![CDATA[%s]]></%s>\n", indent, "", tag, text, tag);
}

static void
xml_tag_empty_attr(const char *tag, const char *attr_fmt, ...)
{
   va_list attr_params;
   printf("%*s<%s ", indent, "", tag);
   va_start(attr_params, attr_fmt);
   vprintf(attr_fmt, attr_params);
   va_end(attr_params);
   printf("/>\n");
}

static void
xml_tag_simple_attr(const char *tag, const char *text,
          const char *attr_fmt, ...)
{
   va_list attr_params;
   printf("%*s<%s ", indent, "", tag);
   va_start(attr_params, attr_fmt);
   vprintf(attr_fmt, attr_params);
   va_end(attr_params);
   printf(">%s</%s>\n", text, tag);
}

/* see PSColorDef in xkbprint */
static int
parse_xkb_color_spec(char *colorspec)
{
   long level;

   if (strcmp(colorspec, "black") == 0)
      return 0;
   else if (strcmp(colorspec, "white") == 0)
      return 0xFFFFFF;
   else if (strncmp(colorspec, "grey", 4) == 0 ||
       strncmp(colorspec, "gray", 4) == 0) {
      level = strtol(colorspec + 4, NULL, 10);
      return (0xFF - 0xFF * level / 100) << 16 |
          (0xFF - 0xFF * level / 100) << 8 |
          (0xFF - 0xFF * level / 100);
   } else if (strcmp(colorspec, "red") == 0)
      return 0xFF0000;
   else if (strcmp(colorspec, "green") == 0)
      return 0x00FF00;
   else if (strcmp(colorspec, "blue") == 0)
      return 0x0000FF;
   else if (strncmp(colorspec, "red", 3) == 0) {
      level = strtol(colorspec + 3, NULL, 10);
      return (0xFF - 0xFF * level / 100) << 16;
   } else if (strncmp(colorspec, "green", 5) == 0) {
      level = strtol(colorspec + 5, NULL, 10);
      return (0xFF - 0xFF * level / 100) << 8;
   } else if (strncmp(colorspec, "blue", 4) == 0) {
      level = strtol(colorspec + 4, NULL, 10);
      return (0xFF - 0xFF * level / 100);
   } else
      return -1;
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
}

static void
xml_modifiers_to_iso(unsigned char rmods, unsigned short vmods,
            XkbDescPtr kbd)
{
    int k = 0;
    while (rmods != 0) {
        int m = rmods & 0x01;
        if (m) {
            xml_tag_empty_attr
                ("modifier", "name=\"%s\"", real_mods[k]);
        }
        k++;
        rmods >>= 1;
    }
    k = 0;
    while (vmods != 0) {
        int m = vmods & 0x01;
        if (m) {
            Atom vmn = kbd->names->vmods[k];
            xml_tag_empty_attr
                ("modifier",
                 "name=\"%s\"", XGetAtomName(kbd->dpy, vmn));
        }
        k++;
        vmods >>= 1;
    }
}

static void
xkb_outline_to_svg(XkbOutlinePtr outline, XkbColorPtr color)
{
    // TODO: process round corners
    int i;
    XkbPointPtr point = outline->points;
    char buf[1024];
    switch (outline->num_points) {
    case 1:
        xml_tag_empty_attr("rect",
                   "width=\"%d\" height=\"%d\" x=\"%d\" y=\"%d\" rx=\"%d\"
ry=\"%d\" fill=\"url(#%s)\" stroke=\"grey\"",
                   point->x, point->y, 0, 0,
                   outline->corner_radius,
                   outline->corner_radius, color->spec);
        break;
    case 2:
        xml_tag_empty_attr("rect",
                   "width=\"%d\" height=\"%d\" x=\"%d\" y=\"%d\" rx=\"%d\"
ry=\"%d\" fill=\"url(#%s)\" stroke=\"grey\"",
                   point[1].x - point->x,
                   point[1].y - point->y,
                   point->x, point->y,
                   outline->corner_radius,
                   outline->corner_radius, color->spec);
        break;
    default:
        sprintf(buf, "M %d %d ", point->x, point->y);
        point++;
        for (i = outline->num_points; --i > 0;) {
            char tmp[30];
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
            sprintf(tmp, "L %d %d ", point->x, point->y);
            strcat(buf, tmp);
            point++;
        }
        xml_tag_empty_attr("path",
                  "d=\"%s z\" fill=\"url(#%s)\" stroke=\"grey\"",
                  buf, color->spec);
    }
}

static void
xkb_shape_to_svg(XkbShapePtr shape, XkbColorPtr color, XkbDescPtr kbd)
{
    int i;
    /* xml_comment("shape: [%s]", XGetAtomName(kbd->dpy, shape->name)); */
    XkbOutlinePtr outline = shape->outlines;
    for (i = shape->num_outlines; --i >= 0; outline++) {
        xkb_outline_to_svg(outline, color);
    }
}

static char *
xkb_keyname_to_string(char *name)
{
    // all the names have max length 4 //
    // (in this case, they are not null-terminated)
    static char buf[5];
    *(long *) buf = *(long *) name;
    buf[4] = 0;
    return buf;
}

static void
xkb_key_to_svg(XkbKeyPtr key, XkbDescPtr kbd)
{
    xml_tag_open_attr("g", "id=\"%s\"",
             xkb_keyname_to_string(key->name.name));
    xkb_shape_to_svg(XkbKeyShape(kbd->geom, key),
            XkbKeyColor(kbd->geom, key), kbd);
    xml_tag_close("g");
}

static const char *
xkb_normalize_indicator_name(const char *indicator_name)
{
    static char buf[1024];
    char *p = buf;
    strncpy(buf, indicator_name, sizeof(buf));
    buf[sizeof(buf) - 1] = 0;
    for (; *p; p++)
        if (' ' == *p)
            *p = '_';
    return buf;
}

static void
xkb_doodad_to_svg(XkbDoodadPtr doodad, XkbDescPtr kbd)
{
    if (doodad->any.angle != 0)
        xml_tag_open_attr("g",
                 "transform=\"translate(%d,%d) rotate(%.1f)\"",
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                doodad->any.left, doodad->any.top,
                0.1 * doodad->any.angle);
    else
        xml_tag_open_attr("g",
                "transform=\"translate(%d,%d)\"",
                doodad->any.left, doodad->any.top);
    switch (doodad->any.type) {
    case XkbUnknownDoodad:
        break;
    case XkbOutlineDoodad:
    case XkbSolidDoodad:
        xkb_shape_to_svg(XkbShapeDoodadShape
                (kbd->geom, &doodad->shape),
                XkbShapeDoodadColor(kbd->geom,
                           &doodad->shape), kbd);
        break;
    case XkbTextDoodad:
        xml_tag_simple_attr("text",
                   doodad->text.text,
                   "x=\"%d\" y=\"%d\" font-family=\"%s\" font-size=\"%dmm\"
fill=\"url(#%s)\"",
                   doodad->text.font,
                   doodad->text.height / 10,
                   XkbTextDoodadColor
                   (kbd->geom, &doodad->text)->spec);
        break;
    case XkbIndicatorDoodad:
        xml_tag_open_attr("g", "id=\"%s\"",
                xkb_normalize_indicator_name(XGetAtomName
                            (kbd->dpy,
                           doodad->
                           indicator.
                           name)));
        xkb_shape_to_svg(XkbIndicatorDoodadShape
                (kbd->geom, &doodad->indicator),
                XkbIndicatorDoodadOffColor(kbd->geom,
                            &doodad->
                            indicator),
                kbd);
        xml_tag_close("g");
        break;
    case XkbLogoDoodad:
        xkb_shape_to_svg(XkbLogoDoodadShape
                (kbd->geom, &doodad->logo),
                XkbLogoDoodadColor(kbd->geom,
                          &doodad->logo), kbd);
        break;
    }
    xml_tag_close("g");
}

static void
xkb_section_to_svg(XkbSectionPtr section, XkbDescPtr kbd)
{
    int i, j;
    XkbRowPtr row = section->rows;
    if (section->angle != 0)
        xml_tag_open_attr("g",
                "transform=\"translate(%d,%d) rotate(%.1f) translate(%d,%d)\"",
                section->left,
                section->top,
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                0.1 * section->angle,
                -section->left, -section->top);

    for (i = section->num_rows; --i >= 0; row++) {
        int x = section->left + row->left;
        int y = section->top + row->top;
        XkbKeyPtr key = row->keys;
        for (j = row->num_keys; --j >= 0; key++) {
            if (row->vertical)
                y += key->gap;
            else
                x += key->gap;
            xml_tag_open_attr("g",
                    "transform=\"translate(%d,%d)\"",
                    x, y);
            xkb_key_to_svg(key, kbd);
            xml_tag_close("g");
            if (row->vertical)
                y += XkbKeyShape(kbd->geom,
                        key)->bounds.y2;
            else
                x += XkbKeyShape(kbd->geom,
                        key)->bounds.x2;
        }
    }
    XkbDoodadPtr doodad = section->doodads;
    for (i = section->num_doodads; --i >= 0; doodad++) {
        if (section->angle != 0) {
            xkb_doodad_to_svg(doodad, kbd);
        }
    }
    if (section->angle != 0)
        xml_tag_close("g");
}

static void
xkb_geom_to_svg(XkbGeometryPtr geom, XkbDescPtr kbd)
{
    int gw = geom->width_mm;
    int gh = geom->height_mm;
    char *descr = XGetAtomName(kbd->dpy, geom->name);
    XkbColorPtr base = geom->base_color;
    int i;

    xml_comment("description: [%s]", descr);

    xml_tag_open_attr("svg",
             "xmlns=\"%s\" width=\"%d\" height=\"%d\"",
             "http://www.iso.org/jtc1/sc35/wg1/iso24757", gw, gh);
    xml_tag_open("defs");
    XkbColorPtr color = geom->colors;
    for (i = geom->num_colors; --i >= 0; color++) {
        /* Very linear pattern - same color everywhere */
        xml_tag_open_attr("linearGradient", "id=\"%s\"",
                 color->spec);
        int clr = parse_xkb_color_spec(color->spec);
        xml_tag_empty_attr("stop",
                  "offset=\"0%\" stop-color=\"#%06x\"",
                  clr);
        xml_tag_empty_attr("stop",
                  "offset=\"100%\" stop-color=\"#%06x\"",
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
                clr);
        xml_tag_close("linearGradient");
    }
    xml_tag_close("defs");

    xml_tag_empty_attr("rect",
               "width=\"%d\" height=\"%d\" x=\"0\" y=\"0\" fill=\"url(#%s)\"
stroke=\"grey\"",
               gw, gh, base->spec);

    unsigned int priority;
    for (priority = 0; priority <= 255; priority++) {
        XkbSectionPtr section = geom->sections;
        for (i = geom->num_sections; --i >= 0; section++) {
            if (section->priority == priority)
                xkb_section_to_svg(section, kbd);
        }

        XkbDoodadPtr doodad = geom->doodads;
        for (i = geom->num_doodads; --i >= 0; doodad++) {
            if (doodad->any.priority == priority)
                xkb_doodad_to_svg(doodad, kbd);
        }
    }

    xml_tag_close("svg");
}

static char *
xkb_keycode_to_string(int keycode, XkbDescPtr kbd)
{
    return xkb_keyname_to_string(kbd->names->keys[keycode].name);
}

static void
xkb_keycode_to_iso(int keycode, XkbDescPtr kbd)
{
    char *name = xkb_keycode_to_string(keycode, kbd);
    // output named keycodes only!
    if (name[0])
        xml_tag_empty_attr("keycode",
                  "id=\"%s\" value=\"%d\"", name,
                  keycode);
}

static void
xkb_keycode_alias_to_iso(int idx, XkbKeyAliasPtr alias)
{
    char bufa[5];
    char bufr[5];
    *(long *) bufa = *(long *) alias->alias;
    *(long *) bufr = *(long *) alias->real;
    bufa[4] = bufr[4] = 0;

    xml_tag_empty_attr("alias", "id=\"%s\" ref=\"%s\"", bufa, bufr);
}

static void
xkb_type_to_iso(XkbKeyTypePtr type, XkbDescPtr kbd)
{
    int j;
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    xml_tag_open_attr("type", "name=\"%s\" numLevels=\"%d\"",
             XGetAtomName(kbd->dpy,
                      type->name), type->num_levels);
    xml_tag_open("map");
    for (j = 0; j < type->map_count; j++) {
        unsigned short vmods;
        unsigned char rmods;
        if (!type->map[j].active)
            continue;
        vmods = type->map[j].mods.vmods;
        rmods = type->map[j].mods.real_mods;
        xml_comment("vmods: %X, rmods: %X", vmods, rmods);
        if (vmods != 0 || rmods != 0) {
            xml_tag_open_attr("mapEntry",
                     "level=\"%d\"",
                     type->map[j].level + 1);
            xml_modifiers_to_iso(rmods, vmods, kbd);
            xml_tag_close("mapEntry");
        }
    }
    xml_tag_close("map");

    xml_tag_close("type");
}

static void
xkb_sym_interpret_to_iso(XkbSymInterpretPtr si, XkbDescPtr kbd)
{
    const char *action_type, *action = NULL, *predicate;
    XkbGroupAction *group_action;
    XkbModAction *mod_action;
    const char *predicates[] = {
        // "XkbSI_NoneOf", "XkbSI_AnyOfOrNone", "XkbSI_AnyOf", "XkbSI_AllOf",
"XkbSI_Exactly" };
        "none", NULL, "any", "all", "exactly"
    };
    int keysym = si->sym;

    switch (si->act.type) {
    case XkbSA_SetMods:
    case XkbSA_SetGroup:
        action = "set";
        break;
    case XkbSA_LatchMods:
    case XkbSA_LatchGroup:
        action = "latch";
        break;
    case XkbSA_LockMods:
    case XkbSA_LockGroup:
        action = "lock";
        break;
    }
    /* Unsupported actions */
    if (action == NULL)
        return;

    xml_tag_open("rule");
    xml_tag_open("condition");

    /* Only real modifiers are used in rules */
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    xml_tag_empty_attr("keysym", "id=\"%s\"", XKeysymToString(keysym));

    predicate = predicates[si->match & XkbSI_OpMask];
    if (si->mods && predicate != NULL) {
        if (predicate != NULL)
            xml_tag_open_attr("modifiersList",
                      "predicate=\"%s\"", predicate);
        else
            xml_tag_open("modifiersList");

        xml_modifiers_to_iso(si->mods, 0, kbd);
        xml_tag_close("modifiersList");
    }
    xml_tag_close("condition");
    xml_tag_open("action");

    switch (si->act.type) {
    case XkbSA_SetMods:
    case XkbSA_LatchMods:
    case XkbSA_LockMods:
        action_type = "modifiers";
        mod_action = (XkbModAction *) & si->act;
        xml_tag_open_attr(action, "changeType=\"%s\"",
                 action_type);
        xml_comment("flags: %X", mod_action->flags);
        if (mod_action->flags & XkbSA_UseModMapMods)
            xml_modifiers_to_iso(si->mods, 0, kbd);
        else
            xml_modifiers_to_iso(mod_action->real_mods,
                        (mod_action->
                         vmods1 << 8) |
                        mod_action->vmods2, kbd);
        break;
    case XkbSA_SetGroup:
    case XkbSA_LatchGroup:
    case XkbSA_LockGroup:
        action_type = "group";
        group_action = (XkbGroupAction *) & si->act;
        xml_tag_open_attr(action,
                 "changeType=\"%s\" relative=\"%s\"",
                 action_type,
                 group_action->
                 flags & XkbSA_GroupAbsolute ?
                 "false" : "true");
        xml_data("%d",
             (int) (signed char) group_action->group_XXX);
        break;
    }

    xml_tag_close(action);

    xml_tag_close("action");
    xml_tag_close("rule");
}

static void
xkb_sym_map_to_iso(int keycode, XkbSymMapPtr symmap, XkbDescPtr kbd)
{
    int g, tg = XkbNumGroups(symmap->group_info);
    if (!tg)
        return;
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    xml_tag_open_attr("key", "scancode=\"%d\" keycode=\"%s\"",
             keycode, xkb_keycode_to_string(keycode, kbd));
    for (g = 0; g < tg; g++) {
        int sl;
        xml_tag_open_attr("group", "type=\"%s\"",
                 XGetAtomName(kbd->dpy,
                         kbd->map->
                         types[symmap->
                          kt_index[g]].name));
        for (sl = 0; sl < symmap->width; sl++) {
            xml_tag_open("shiftLevel");
            KeySym ks =
                kbd->map->syms[symmap->offset +
                      g * symmap->width + sl];
            char buf[8] = "";
            int tr = XkbTranslateKeySym(kbd->dpy, &ks, 0, buf,
                         sizeof(buf), NULL);
            char *kss = XKeysymToString(ks);
            if (tr == 0 || iscntrl(buf[0])) {
                xml_tag_simple("symbol", kss ? kss : "");
                xml_comment("XkbTranslateKeySym: [%s]",
                        buf);
            } else {
                xml_tag_simple("symbol", buf);
                xml_comment("keysym2string: [%s]",
                        kss ? kss : "NoSymbol");
            }
            xml_tag_close("shiftLevel");
        }
        xml_tag_close("group");
    }

    xml_tag_close("key");
}

static void
xkb_indicator_which_to_iso(unsigned char which)
{
    if (which & XkbIM_UseBase)
        xml_tag_empty_attr("use", "which=\"base\"");
    if (which & XkbIM_UseLatched)
        xml_tag_empty_attr("use", "which=\"latched\"");
    if (which & XkbIM_UseLocked)
        xml_tag_empty_attr("use", "which=\"locked\"");
    if (which & XkbIM_UseEffective)
        xml_tag_empty_attr("use", "which=\"effective\"");
    if (which & XkbIM_UseCompat)
        xml_tag_empty_attr("use", "which=\"compat\"");
}

static void
xkb_indicator_to_iso(int idx, XkbIndicatorMapPtr indicator, XkbDescPtr kbd)
{
    xml_tag_open_attr("indicator", "name=\"%s\"",
             xkb_normalize_indicator_name(XGetAtomName
                          (kbd->dpy,
                         kbd->
                         names->
                         indicators[idx])));
    if (indicator->which_groups) {
        xml_tag_open("groups");
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
        xkb_indicator_which_to_iso(indicator->which_groups);
        if (indicator->groups & XkbGroup1Mask)
            xml_tag_empty_attr("group", "which=\"0\"");
        if (indicator->groups & XkbGroup2Mask)
            xml_tag_empty_attr("group", "which=\"1\"");
        if (indicator->groups & XkbGroup3Mask)
            xml_tag_empty_attr("group", "which=\"2\"");
        if (indicator->groups & XkbGroup4Mask)
            xml_tag_empty_attr("group", "which=\"3\"");
        xml_tag_close("groups");
    }

    if (indicator->which_mods) {
        xml_tag_open("reflectedModifiers");
        xkb_indicator_which_to_iso(indicator->which_mods);
        xml_modifiers_to_iso(indicator->mods.real_mods,
                    indicator->mods.vmods, kbd);
        xml_tag_close("reflectedModifiers");
    }

    xml_tag_close("indicator");
}

static void
xkb_to_iso(XkbDescPtr kbd)
{
    int i;
    xml_tag_open_attr("keyboard", "xmlns=\"%s\"", ISO_KB_NAMESPACE);
    xml_tag_open("dictionaries");
    /*
     * Keycodes
     */
    xml_tag_open("keycodes");
    for (i = kbd->min_key_code; i <= kbd->max_key_code; i++) {
        xkb_keycode_to_iso(i, kbd);
    }

    /*
     * Aliases
     */
    for (i = 0; i < kbd->names->num_key_aliases; i++) {
        xkb_keycode_alias_to_iso(i, kbd->names->key_aliases + i);
    }
    xml_tag_close("keycodes");
    /*
     * Modifiers
     */
    xml_tag_open("modifiers");
    /* First, real modifiers */
    for (i = 0; i < sizeof(real_mods) / sizeof(real_mods[0]); i++)
        xml_tag_empty_attr("modifier", "name=\"%s\"",
                    real_mods[i]);
    for (i = 0; i < XkbNumVirtualMods; i++) {
        Atom vmn = kbd->names->vmods[i];
        // Output all modified names till 0
        if (vmn == None)
            break;
        xml_tag_empty_attr("modifier", "name=\"%s\"",
                    XGetAtomName(kbd->dpy, vmn));
    }
    xml_tag_close("modifiers");
```

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    /*
     * Types
     */
    xml_tag_open("types");
    for (i = 0; i < kbd->map->num_types; i++) {
        xkb_type_to_iso(kbd->map->types + i, kbd);
    }
    xml_tag_close("types");
    /*
     * Compat
     */
    xml_tag_open("interpretation");
    for (i = 0; i < kbd->compat->num_si; i++) {
        xkb_sym_interpret_to_iso(kbd->compat->
                    sym_interpret + i, kbd);
    }
    xml_tag_close("interpretation");
    xml_tag_close("dictionaries");

    /*
     * Meta-info
     */
    xml_tag_open("meta");
    xml_tag_open("countriesList");
    xml_tag_close("countriesList");
    xml_tag_open("languagesList");
    xml_tag_close("languagesList");
    xml_tag_close("meta");

    /*
     * Geometry
     */
    xml_tag_open("nonFunctional");
    xml_tag_open("geometry");
    xkb_geom_to_svg(kbd->geom, kbd);
    xml_tag_close("geometry");
    xml_tag_close("nonFunctional");
    xml_tag_open("functional");
    /*
     * Groups
     */
    xml_tag_open("groupList");
    Atom *group = kbd->names->groups;
    for (i = kbd->ctrls->num_groups; --i >= 0;) {
        xml_tag_empty_attr("group", "name=\"%s\"",
                  XGetAtomName(kbd->dpy, *group++));
    }
    xml_tag_close("groupList");

    /*
     * Keys
     */
    xml_tag_open("keyList");
    for (i = kbd->min_key_code; i <= kbd->max_key_code; i++) {
        xkb_sym_map_to_iso(i, kbd->map->key_sym_map + i, kbd);
    }
    xml_tag_close("keyList");

    /*
     * Indicators
     */
```


© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

```
    xml_tag_open("indicatorsList");
    unsigned long pi = kbd->indicators->phys_indicators;
    XkbIndicatorMapPtr indicator = kbd->indicators->maps;
    for (i = XkbNumIndicators; --i >= 0; indicator++) {
        if (pi & 1) {
            xkb_indicator_to_iso(XkbNumIndicators - 1 -
                        i, indicator, kbd);
        }
        pi >>= 1;
    }
    xml_tag_close("indicatorsList");
    xml_tag_close("functional");
    xml_tag_close("keyboard");
}

static void
print_iso_legal(void)
{
    printf("<!--\n");
    printf
        ("  This keyboard definition was autogenerated by xkb2iso tool /$Id:
xkb2iso.c 8 2007-03-01 20:03:28Z svu $/.\n");
    printf
        ("  It corresponds to the ISO/IEC keyboard definition specification:\n");
    printf
        ("  {placeholder for the URL of the latest version of documentation}\n");

    printf("  2006-2007 (c) Sergey V. Udaltsov\n");
    printf("-->\n");
}

int
main(int argc, const char *argv[])
{
    int evt, err, maj = 1, min = 0, reason = 0;

    setlocale(LC_ALL, "");

    Display *dpy = XkbOpenDisplay(NULL, &evt, &err, &maj, &min,
                    &reason);

    print_iso_legal();

    xml_comment("dpy: %p", dpy);
    if (dpy != NULL) {
        XkbDescPtr kbd = XkbGetKeyboard(dpy, XkbAllComponentsMask,
                     XkbUseCoreKbd);
        xml_comment("kbd: %p", kbd);
        XkbGetControls(kbd->dpy, XkbAllControlsMask, kbd);
        xkb_to_iso(kbd);
        XkbFreeKeyboard(kbd, XkbAllComponentsMask, True);
        XCloseDisplay(dpy);
        return 0;
    } else {
        printf("Could not open display:%d \n", reason);
    }
}
```

© ISO/IEC 2008 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Bibliography

[1] ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes*

[2] ISO/IEC 19757-2:2003, *Information technology — Document Schema Definition Language (DSDL) — Part 2: Regular-grammar-based validation — RELAX NG*

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

ICS 35.180

Price based on 136 pages

© ISO/IEC 2008 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale