
Status of this Memo

This memo provides information for the Internet community. This memo does not specify an Internet standard of any kind. Distribution of this memo is unlimited.

Introduction

This memo describes a text encoding scheme: "ISO-2022-JP-2", which is used experimentally for electronic mail [RFC822] and network news [RFC1036] messages in several Japanese networks. The encoding is a multilingual extension of "ISO-2022-JP", the existing encoding for Japanese [2022JP]. The encoding is supported by an Emacs based multilingual text editor: MULE [MULE].

The name, "ISO-2022-JP-2", is intended to be used in the "charset" parameter field of MIME headers (see [MIME1] and [MIME2]).

Description

The text with "ISO-2022-JP-2" starts in ASCII [ASCII], and switches to other character sets of ISO 2022 [ISO2022] through limited combinations of escape sequences. All the characters are encoded with 7 bits only.

At the beginning of text, the existence of an announcer sequence: "ESC 2/0 4/1 ESC 2/0 4/6 ESC 2/0 5/10" is (though omitted) assumed. Thus, characters of 94 character sets are designated to G0 and invoked as GL. C1 control characters are represented with 7 bits. Characters of 96 character sets are designated to G2 and invoked with SS2 (single shift two, "ESC 4/14" or "ESC N").

For example, the escape sequence "ESC 2/4 2/8 4/3" or "ESC $ ( C" indicates that the bytes following the escape sequence are Korean KSC characters, which are encoded in two bytes each. The escape sequence "ESC 2/14 4/1" or "ESC . A" indicates that ISO 8859-1 is designated to G2. After the designation, the single shifted sequence "ESC 4/14 4/1" or "ESC N A" is interpreted to represent a character "A with acute".
The following table gives the escape sequences and the character sets used in "ISO-2022-JP-2" messages. The reg# is the registration number in ISO's registry [ISOREG].

94 character sets

<table>
<thead>
<tr>
<th>reg#</th>
<th>character set</th>
<th>ESC sequence</th>
<th>designated to</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>ASCII</td>
<td>ESC 2/8 4/2</td>
<td>ESC ( B</td>
</tr>
<tr>
<td>42</td>
<td>JIS X 0208-1978</td>
<td>ESC 2/4 4/0</td>
<td>ESC $ @</td>
</tr>
<tr>
<td>87</td>
<td>JIS X 0208-1983</td>
<td>ESC 2/4 4/2</td>
<td>ESC $ B</td>
</tr>
<tr>
<td>14</td>
<td>JIS X 0201-Roman</td>
<td>ESC 2/8 4/10</td>
<td>ESC ( J</td>
</tr>
<tr>
<td>58</td>
<td>GB2312-1980</td>
<td>ESC 2/4 4/1</td>
<td>ESC $ A</td>
</tr>
<tr>
<td>149</td>
<td>KSC5601-1987</td>
<td>ESC 2/4 2/8</td>
<td>ESC $ ( C</td>
</tr>
<tr>
<td>159</td>
<td>JIS X 0212-1990</td>
<td>ESC 2/4 2/8</td>
<td>ESC $ ( D</td>
</tr>
</tbody>
</table>

96 character sets

<table>
<thead>
<tr>
<th>reg#</th>
<th>character set</th>
<th>ESC sequence</th>
<th>designated to</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>ISO8859-1</td>
<td>ESC 2/14 4/1</td>
<td>ESC . A</td>
</tr>
<tr>
<td>126</td>
<td>ISO8859-7(Greek)</td>
<td>ESC 2/14 4/6</td>
<td>ESC . F</td>
</tr>
</tbody>
</table>

For further information about the character sets and the escape sequences, see [ISO2022] and [ISOREG].

If there is any G0 designation in text, there must be a switch to ASCII or to JIS X 0201-Roman before a space character (but not necessarily before "ESC 4/14 2/0" or "ESC N ' '") or control characters such as tab or CRLF. This means that the next line starts in the character set that was switched to before the end of the previous line. Though the designation to JIS X 0201-Roman is allowed for backward compatibility to "ISO-2022-JP", its use is discouraged. Applications such as pagers and editors which randomly seek within a text file encoded with "ISO-2022-JP-2" may assume that all the lines begin with ASCII, not with JIS X 0201-Roman.

At the beginning of a line, information on G2 designation of the previous line is cleared. New designation must be given before a character in 96 character sets is used in the line.

The text must end in ASCII designated to G0.

As the "ISO-2022-JP", and thus, "ISO-2022-JP-2", is designed to represent English and modern Japanese, left-to-right directionality is assumed if the text is displayed horizontally.

Users of "ISO-2022-JP-2" must be aware that some common transport such as old Bnews can not relay a 7-bit value 7/15 (decimal 127), which is used to encode, say, "y with diaeresis" of ISO 8859-1.
Other restrictions are given in the Formal Syntax section below.

Formal Syntax

The notational conventions used here are identical to those used in STD 11, RFC 822 [RFC822].

The * (asterisk) convention is as follows:

1*m something

meaning at least 1 and at most m somethings, with l and m taking default values of 0 and infinity, respectively.

message = headers 1*(CRLF text)
         ; see also [MIME1] "body-part"
         ; note: must end in ASCII

text = *(single-byte-char /
       g2-desig-seq /
       single-shift-char) [*segment
       reset-seq
       *(single-byte-char /
       g2-desig-seq /
       single-shift-char ) ]
       ; note: g2-desig-seq must
       ; precede single-shift-char

headers = <see [RFC822] "fields" and [MIME1] "body-part">

segment = single-byte-segment / double-byte-segment

single-byte-segment = single-byte-seq
                     *(single-byte-char /
                     g2-desig-seq /
                     single-shift-char )

double-byte-segment = double-byte-seq
                     *((one-of-94 one-of-94) /
                     g2-desig-seq /
                     single-shift-char )

reset-seq = ESC "(" ( "B" / "J" )

single-byte-seq = ESC "(" ( "B" / "J" )

double-byte-seq = (ESC "$" ( "@" / "A" / "B" )) /
The name given to the character encoding is "ISO-2022-JP-2". This name is intended to be used in MIME messages as follows:

Content-Type: text/plain; charset=iso-2022-jp-2

The "ISO-2022-JP-2" encoding is already in 7-bit form, so it is not necessary to use a Content-Transfer-Encoding header. It should be noted that applying the Base64 or Quoted-Printable encoding will render the message unreadable in non-MIME-compliant software.

"ISO-2022-JP-2" may also be used in MIME headers. Both "B" and "Q" encoding could be useful with "ISO-2022-JP-2" text.
References


[ISOREG] International Organization for Standardization (ISO), "International Register of Coded Character Sets To Be Used With Escape Sequences".


Acknowledgements

This memo is the result of discussion between various people in a news group: fj.kanji and is reviewed by a mailing list: jp-msg @iij.ad.jp. The Authors wish to thank in particular Prof. Eiichi Wada for his suggestions based on profound knowledge in ISO 2022 and related standards.
Security Considerations

Security issues are not discussed in this memo.

Authors' Addresses

Masataka Ohta
Tokyo Institute of Technology
2-12-1, O-okayama, Meguro-ku,
Tokyo 152, JAPAN

Phone: +81-3-5499-7084
Fax: +81-3-3729-1940
EMail: mohta@cc.titech.ac.jp

Ken’ichi Handa
Electrotechnical Laboratory
Umezono 1-1-4, Tsukuba,
Ibaraki 305, JAPAN

Phone: +81-298-58-5916
Fax: +81-298-58-5918
EMail: handa@etl.go.jp