TO: MSPM Distribution
FROM: J. H. Saltzer
SUBJECT: BC.2.04
DATE: 02/06/68

BC.2.04 has the following minor changes:

1.   A missing sentence on page 2 is reinserted.

2.   The escape conventions for the 029 keypunch are
      changed:

            a.   initial letter case is normal.

            b.   "Change case" escape _reverses_ case
                  interpretation.

      These changes permit use of both multiple punches
      and escape sequences, whichever are more convenient,
      within a single deck.

3.   Early PRT-202 printer escapes are obsolete, and
      deleted.

Identification

Character Escape Conventions
F. J. Corbató, R. Morris, J. H. Saltzer

Purpose

Contemporary console equipment often is not capable of
representing all 128 of the ASCII code values. To keep
full generality and flexibility in the future, standard
software escape conventions will be used for all console
devices. On devices which have the revised ASCII set,
the use of the escape mechanism will normally be unnecessary.
Each class of console device has a particular character
assigned as the "software escape" character; when this
character occurs in an input (or output) string to (or
from) a console it always gives a special interpretation
to the next one or more character. The standard escape
character will be the left slant; this means that to input
the code for it, an escape convention will have to be
used. Therefore the left slant should be avoided in all
Multics software. (It should be noted that the two standard
kill and erase characters @ and # should also be avoided
in all software).

All Consoles

For simplicity, universal escape conventions have been
established which are uniform over several possible console
classes. For full flexibility there is a mechanism for
representing any arbitrary octal code in a character string.
This is:

   \d1d2d3 for the octal code d1 d2 d3 where d1, d2, d3 are
   from 0 to 7.

   \Ck for a local (i.e. concealed) use of the character
   k which does not go into the computer-stored string
   on input and which is not in the computer-stored
   string on output. (For example, a concealed carriage
   return given to avoid a right-margin jam up.)

\Ex where "x" is any graphic character. "x" becomes
the erase character.

\Kx where "x" is any graphic character. "x" becomes
the kill character.

One additional stylistic convention holds at all consoles:
the solid vertical bar (|) and the broken vertical bar (¦)
are considered equivalent alternate stylizations of the
graphic for ASCII code value 171.

37KSR Teletypes

There are no further escape conventions required of the
model 37KSR Teletype, since it uses the revised ASCII
character set.

IBM 1050 and 2741 Consoles

Each type ball used will require a different set of escape
conventions.

Correspondence (938) Type ball.

The following non-ASCII characters on the ball are considered
to be stylized versions of ASCII characters:

¢	(cent-sign)	for \	(left slant - software escape)
⋈	(lozenge)	for |	(vertical stroke)
±	(plus-minus)	for ^	(circumflex)
'	(apostrophe)	for ´	(accent acute)

In addition to the four universal escape conventions, the
following are available for convenience:

¢'	for `	(accent grave)
¢t	for ~	(overline/tilde)
¢¢(	for [	(left square bracket)
¢¢)	for]	(right square bracket)
¢l	for <	(less than)
¢g	for >	(greater than)
¢(	for {	(left brace)
¢)	for }	(right brace)

EBCDIC Type ball (963) and EBCDIC Keypunches

The following non-ASCII EBCDIC graphics are considered to be
stylized versions of ASCII characters:

¢	(cent sign)	for \	(left slant - software escape)
'	(apostrophe)	for ´	(accent acute)
¬	(negation)	for ^	(circumflex)

In addition to the four universal escape conventions, the
following are available for convenience:

    ¢'   for ` (accent grave)
    ¢<   for [(left square bracket)
    ¢>   for] (right square bracket)
    ¢(for { (left brace)
    ¢)   for } (right brace)
    ¢t   for ~ (overline/tilde)

In the case of IBM 029 keypunches with EBCDIC codes, it
is convenient to have:

    ¢-   designates backspace.
    ¢U   designates that all subsequent letters are interpreted
            normally until a ¢L sequence is encountered.
            (This is assumed as the initial letter case mode).
    ¢L   designates that all subsequent letters are interpreted
            in opposite case (upper case as lower, lower case
            as upper) until a ¢U sequence is encountered.
    ¢¢n   where n = 1, 2, ..., 9 designates that the next
            n alphabetic characters are to be in the opposite
            case from the present case. (This is useful for
            initial capitalization of words, etc.)

In the case of keypunches, an end-of-card automatically
generates a New Line character; it is also convenient for
input to have:

    ¢*   for "skip reading the remainder of this card
            without the New Line character"
    ¢/   for "New Line and skip reading the remainder
            of this card"
    ¢+   for "New Line and keep reading this card"
    ¢H   for horizontal tab

Note that one may use the multiple punch codes described in
BB.3.02 when at an 029 Keypunch instead of the above escape
conventions. The two sets of conventions (escape and
multiple punch) are interchangeable, even in the same
card deck.

35KSR and 33KSR Teletypes and 64 Character "ASCII" Keypunches

The escape character is: \ (reverse slash). The following
non-ASCII characters are considered to be stylized versions
of ASCII characters:

    ↑   (up arrow)   for | (vertical stroke)
    ←   (left arrow)   for _   (underline)
    '   (apostrophe)   for ´   (accent acute)

In addition to the four universal escape conventions, the following are available for convenience:

\-	designates backspace.
\U	designates that all subsequent letters are in upper case until a \L sequence is encountered.
\L	designates that all subsequent letters are in lower case until a \U sequence is encountered. (This is assumed as the initial letter case mode.)
\\n	where n = 1, 2, ..., 9 designates that the next n alphabetic characters are to be in the <u>opposite</u> case from the present case. (This is useful for initial capitalization of words, etc.)

\T	for ~	(overline/tilde)
\X	for ^	(circumflex)
\'	for `	(accent grave)
\(	for {	(left brace)
\)	for }	(right brace)

In the case of keypunches, an end-of-card automatically generates a New Line character; it is also convenient for input to have:

*	for "skip reading the remainder of this card without the New Line character"
\/	for "New Line and skip reading the remainder of this card"
\+	for "New Line and keep reading this card"
\H	for horizontal tab