

## TELNET EXTENDED ASCII OPTION

### 1. Command Name and Code.

EXTEND-ASCII 17

### 2. Command Meanings.

IAC WILL EXTEND-ASCII

The sender of this command requests Permission to begin transmitting, or confirms that it may now begin transmitting extended ASCII, where additional 'control' bits are added to normal ASCII, which are treated specially by certain programs on the host computer.

IAC WON'T EXTEND-ASCII

If the connection is already being operated in extended ASCII mode, the sender of this command demands that the receiver begin transmitting data characters in standard NVT ASCII. If the connection is not already being operated in extended ASCII mode, The sender of this command refuses to begin transmitting extended ASCII.

IAC DO EXTEND-ASCII

The sender of this command requests that the receiver begin transmitting, or confirms that the receiver of this command is allowed to begin transmitting extended ASCII.

IAC DON'T EXTEND-ASCII

The sender of this command demands that the receiver of this command stop or not start transmitting data in extended ASCII mode.

IAC SB EXTASC

<high order bits (bits 15-8)><low order bits (bits 7-0)> IAC SE

This command transmits an extended ASCII character in the form of two 8-bit bytes. Each 8-bit byte contains 8 data bits.

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### 3. Default

DON'T EXTEND-ASCII

WON'T EXTEND-ASCII

i.e., only use standard NVT ASCII

### 4. Motivation.

Several sites on the net, for example, SU-AI and MIT-AI, use keyboards which use almost all 128 characters as printable characters, and use one or more additional bits as "control" bits as command modifiers or to separate textual input from command input to programs. Without these additional bits, several characters cannot be entered as text because they are used for control purposes, such as the greek letter "beta" which on a TELNET connection is CONTROL-C and is used for stopping ones job. In addition there are several commonly used programs at these sites which require these additional bits to be run effectively. Hence it is necessary to provide some means of sending characters larger than 8 bits wide.

### 5. Description of the option.

This option is to allow the transmission of extended ASCII.

Experience has shown that most of the time, 7-bit ASCII is typed, with an occasional "control" character used. Hence, it is expected normal NVT ASCII would be used for 7-bit ASCII and that extended-ASCII be sent as an escape character sequence.

The exact meaning of these additional bits depends on the user program. At SU-AI and at MIT-AI, the first two bits beyond the normal 7-bit ASCII are passed on to the user program and are denoted as follows.

Bit 8 (or 200 octal) is the CONTROL bit

Bit 9 (or 400 octal) is the META bit

(NOTE: "CONTROL" is used in a non-standard way here; that is, it usually refers to codes 0-37 in NVT ASCII. CONTROL and META are echoed by prefixing the normal character with 013 (integral symbol) for CONTROL and 014 (plus-minus) for META. If both are present, it is known as CONTROL-META and echoed as 013 014 7-bit character.)

## 6. Description of Stanford Extended ASCII Characters

In this section, the extended graphic character set used at SU-AI is described for reference, although this specific character set is not required as part of the extended ASCII Telnet option. Characters described as "hidden" are alternate graphic interpretations of codes normally used as format effectors, used by certain typesetting programs.

### Code Graphic represented

000 null (hidden vertically centered dot)  
001 downward arrow  
002 alpha (all Greek letters are lowercase)  
003 beta  
004 logical and (caret)  
005 logical not (dash with downward extension)  
006 epsilon  
007 pi  
010 lambda  
011 tab (hidden gamma)  
012 linefeed (hidden delta)  
013 vertical tab (hidden integral)  
014 formfeed (hidden plus-minus)  
015 carriage return (hidden circled-plus)  
016 infinity  
017 del (partial differential)  
020 proper subset (right-opening horseshoe)  
021 proper superset (left-opening horseshoe)  
022 intersection (down-opening horseshoe)  
023 union (up-opening horseshoe)  
024 universal quantifier (upside-down A)  
025 existential quantifier (backwards E)  
026 circled-times  
027 left-right double headed arrow  
030 underbar  
031 right pointing arrow  
032 tilde  
033 not-equal  
034 less-than-or-equal  
035 greater-than-or-equal  
036 equivalence (column of 3 horizontal bars)  
037 logical or (V shape)  
040-135 as in standard ASCII

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136 upward pointing arrow  
137 left pointing arrow  
140-174 as in standard ASCII  
175 altmode (prints as lozenge)  
176 right brace  
177 rubout (hidden circumflex)