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## Conventions for Using an IBM 2741 Terminal as a User Console for Access to Network Server Hosts

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SUBJECT: Conventions for Using an IBM 2741 Terminal as a User Console for Access to Network Server Hosts

An IBM terminal can be used to key in 92 different codes. These include 88 graphics plus the 4 controls SP, BS, HT, and NL. Each of these have defined ASCII codes except the cent graphic ([1]) and the New Line Control (NL). When the NL character is keyed, the program receiving the keyboard input can translate this signal into the appropriate line end signal for the host which is being used. That is, to a NL, CR, or LF code whichever is appropriate. There are 7 other ASCII graphic characters ( {, }, [, ], ^, \, ` ) and 31 other ASCII controls which cannot be keyed on a 2741 terminal. A convention must be established so that all 128 ASCII codes can be keyed from a 2741 terminal. This requires that one character be chosen as an escape (or prefix) character which, together with following characters, can be converted into any desired ASCII code. In addition to this escape character, there are three other functions which are usually indicated by the typing of a single character key. These are:

- a) character delete -- to cause this character and the preceding character in the input line to be deleted.
- b) line delete -- to cause this character and all previous characters in the current input line to be deleted.
- c) logical line end -- to cause all characters keyed after the last logical line end character or last NL character up to this character to be considered as one logical line with this character being treated as if the NL key were entered. Characters following the logical line end character up to another logical line end character or a NL character are used for form another input line.

Since characters keyed are normally sent to the Server Host, a method must be defined to allow characters keyed to be interpreted by the user program. A system escape character can be used for this purpose. On character at a time systems, the characters keyed between two system escape characters can be interpreted by the user program. On line at a time systems, characters keyed after the system escape character and up to and including a NL character can be interpreted by the user program. Lines interpreted by the user program are not sent to the Server Host.

For those host systems which require use of the INS or INR network control commands, a method must be defined for causing these commands to be sent. These can be sent on a command to the user program either after keying the system escape character or through the use of the 'attention' button on a 2741 terminal. This choice will depend on the characteristics of the terminal user's operating system.

Other commands to the user program might be to:

- a) suppress timeout of received messages
- b) restore timeout of received messages
- c) direct received message to a disk file
- d) direct keyed input to a disk file
- e) abort the user program

The following characters are recommended for the special functions listed above:

- 1. character escape \$NOT [[1](#)]
- 2. system escape |
- 3. character delete @
- 4. line delete \$CENT [[1](#)]
- 5. logical linend #

For the 7 ASCII graphics not on a 2741 terminal, the following character escape and graphic pairs are recommended:

\$NOT <	to translate to	[
\$NOT >	to translate to	]

\$NOT (	to translate to	{
\$NOT )	to translate to	}
\$NOT "	to translate to	^
\$NOT /	to translate to	\
\$NOT '	to translate to	`

To permit the special function characters to be keyed, the following character escape and graphic pairs are recommended:

\$NOT -	to translate to	\$NOT
\$NOT :	to translate to	
\$NOT ,	to translate to	@
\$NOT .	to translate to	\$CENT
\$NOT =	to translate to	#

To key in the ASCII control codes, it is recommended that the character escape followed by two letters be used to specify a control code. These two letters are derived from the mnemonic name of the ASCII control function and are as follows:

\$NOT AC	to translate to	ACK	X'06'
\$NOT BE	to translate to	BEL	X'07'
\$NOT BS	to translate to	BS	X'08'
\$NOT CA	to translate to	CAN	X'18'
\$NOT CR	to translate to	CR	X'0D'
\$NOT D1	to translate to	DC1	X'11'
\$NOT D2	to translate to	DC2	X'12'
\$NOT D3	to translate to	DC3	X'13'
\$NOT D4	to translate to	DC4	X'14'
\$NOT DE	to translate to	DEL	X'7F'
\$NOT DL	to translate to	DLE	X'10'
\$NOT EM	to translate to	EM	X'19'
\$NOT EN	to translate to	ENQ	X'05'
\$NOT EO	to translate to	EOT	X'04'
\$NOT ES	to translate to	ESC	X'1B'
\$NOT EB	to translate to	ETB	X'17'
\$NOT EX	to translate to	ETX	X'03'
\$NOT FF	to translate to	FF	X'0C'
\$NOT FS	to translate to	FS	X'1C'
\$NOT GS	to translate to	GS	X'1D'
\$NOT HT	to translate to	HT	X'09'
\$NOT LF	to translate to	LF	X'0A'

\$NOT NA	to translate to	NAK	X'15'
\$NOT NU	to translate to	NUL	X'00'
\$NOT RS	to translate to	RS	X'1E'
\$NOT SI	to translate to	SI	X'0F'
\$NOT SO	to translate to	SO	X'0E'
\$NOT SH	to translate to	SOH	X'01'
\$NOT SP	to translate to	SP	X'20'
\$NOT ST	to translate to	STX	X'02'
\$NOT SU	to translate to	SUB	X'1A'
\$NOT SY	to translate to	SYN	X'16
\$NOT US	to translate to	US	X'1F'
\$NOT VT	to translate to	VT	X'0B'

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Note that the controls SP, BS, and HT can be specified using the character escape character or directly by keying the appropriate key on a 2741 terminal.

#### Endnote

[1] The following identifiers are substituted for graphics not in ASCII:

\$CENT	Cent sign
\$NOT	Logical NOT ("bent bar")

See the PDF version of this document for graphics that cannot be represented in ASCII format.

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