

TELECOMMUNICATIONS INPUT OR MULTICHARACTER INPUT WITH MULTI-SPECIAL CHARACTER FEATURE

(A sequence inside [] is optional, execution depends upon action atom for the incoming character)

Code	Signal Sequence
F0h ₁ h ₂	(CPB, IBS, [WR, ECHO1/OBS], [WR, ECHO2/OBS], [SAVE DATA]), REPEAT
F1h ₁ h ₂	(CPB, IBS, [ECHO1/OBS], [ECHO2/OBS], [SAVE DATA]), REPEAT
F4h ₁ h ₂	(CPB, IBS, [WR, ECHO1/CBS], [WR, ECHO2/CBS], [SAVE DATA]), REPEAT
F5h ₁ h ₂	(CPB, IBS, [ECHO1/CBS], [ECHO2/CBS], [SAVE DATA]), REPEAT
F8h ₁ h ₂	(CPB, IBS, MASK, [WR, ECHO1/OBS], [WR, ECHO2/OBS], [SAVE DATA]), REPEAT
F9h ₁ h ₂	(CPB, IBS, MASK, [ECHO1/OBS], [ECHO2/OBS], [SAVE DATA]), REPEAT
FCh ₁ h ₂	(CPB, IBS, MASK, [WR, ECHO1/CBS], [WR, ECHO2/CBS], [SAVE DATA]), REPEAT
FDh ₁ h ₂	(CPB, IBS, MASK, [ECHO1/CBS], [ECHO2/CBS], [SAVE DATA]), REPEAT

Action atom for any incoming character not matching a special character.

LEGEND (for Fh₂h₃h₄ microcommands only)

Mnemonic	Operation
CPB	CPU sets Ready/Busy signal level to Ready.
ECHO1/CBS	CPU sends echo of received character with CBS strobe to CO device.
ECHO1/OBS	CPU sends echo of received character with OBS strobe to CO device.
ECHO2/CBS	CPU sends echo of received character with CBS strobe to output channel of input device.*
ECHO2/OBS	CPU sends echo of received character with OBS strobe to output channel of input device.*
IBS	CPU awaits input strobe from enabled device.*
MASK	Set high-order eighth bit of received character to zero.
REPEAT	Repeat sequence in parentheses until valid termination condition detected.
SAVE DATA	Save received character in data buffer.
WR	CPU awaits Ready signal from enabled device.

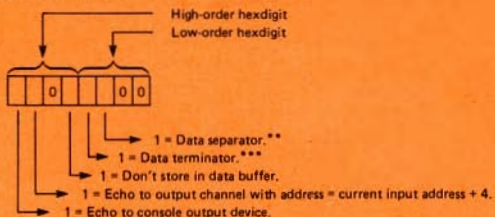
*An Fh₂h₃h₄ microcommand ignores any preceding address strobe of the form 7h₂h₃h₄ and uses the address specified by the \$GIO statement.

REGISTER USAGE

(for \$GIO statements having an Fh₂h₃h₄ microcommand)

Register (Byte)	Bit Position	Use
1	all	Automatic storage of h ₃ h ₄ , specified in the microcommand (with h ₄ set to 0). The stored value is the action atom for any input character not matching a character in the special character list.
2, 3, 4, 5	all	Not used.
6	all	Automatic storage of character received with ENDI-level = 1.
7	all	Not used.
8	01	1 = Buffer overflow.
	02	1 = Element overflow.
	04	Not used.
	08	Not used.
	10	1 = Timeout.
	20	1 = ENDI-level termination.
	40	1 = Terminator-character termination.
	80	1 = Separator received for last element.
9, 10	all	Automatic storage of the count of elements used for incoming data.
11, ...		Storage of special character list (atom, character, atom, character, etc.). The list must end with HEX (2020).

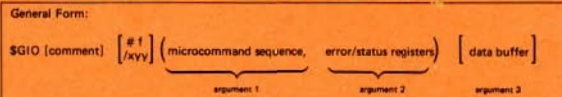
Action Atom Definition



**A separator denotes the end of an input "line"; the next received character is stored as the first character in the next element of the \$GIO buffer. (If a separator is received for the last element, the microcommand is terminated.)

***A terminator denotes the end of a data stream, the microcommand is terminated.

THE \$GIO STATEMENT



Example: 100 \$GIO WRITE /03B (6C01 4400 A206 8601, RS) BS(1) <5,90>

- The microcommand sequence must be one or more groups of four hexdigits (h₁h₂h₃h₄) representing valid codes from the microcommand categories recognized by the System 2200. The microcommand sequence can be specified directly, as shown in the example, or indirectly by an alphanumeric variable into which the appropriate hexdigit values have been previously stored.
- The error/status/general-purpose registers must be represented by an alphanumeric variable at least 10 bytes long (12 or more bytes are needed if an Fh₂h₃h₄ microcommand is used). The byte-positions in the alphanumeric variable are called "registers" to emphasize the multi-purpose usage of the variable.
- The data buffer is needed only if the microcommand sequence includes a multicharacter data transfer microcommand of the form Ah₁h₂h₃h₄, Bh₁h₂h₃h₄, Ch₁h₂h₃h₄ or Fh₁h₂h₃h₄. The \$GIO buffer can be represented by an alpha variable, a string (STR) function, an alpha array designator, or a modified alpha array designator (i.e., an alpha array designator having a field expression specifying the portion of the array to be used for data output or input). The field expression format is as follows:

<s, n> for any \$GIO statement not having an Fh₂h₃h₄ microcommand
<s, m, e> for a \$GIO statement having an Fh₂h₃h₄ microcommand

where:

- s = starting byte
- n = number of consecutive bytes
- m = number of bytes per element
- e = number of elements.

MICROCOMMAND CATEGORIES

Code	Operation	
0h ₂ h ₃ h ₄ , 1h ₂ h ₃ h ₄	Control	no data buffer required
4h ₂ h ₃ h ₄ (h ₂ = 0 through 7)	Single character output	
5h ₂ h ₃ h ₄ (h ₂ = 0 through 7)	Single character output with acknowledge	
6h ₂ h ₃ h ₄ (h ₂ = 0 through F)	Single character output with echo	
7h ₂ h ₃ h ₄ (h ₂ = 1 or 3)	Single address strobe	
8h ₂ h ₃ h ₄ (h ₂ = 0, 2, 8, A)	Single character input with verify	
8Bh ₂ h ₃ h ₄	Single character input	data buffer required
9h ₂ h ₃ h ₄ (h ₂ = 2, 3, 6, 7)	Single character input with echo	
Ah ₂ h ₃ h ₄ (h ₂ = 0, 1, 2, 4, 5, 6)	Multicharacter output	
Bh ₂ h ₃ h ₄ (h ₂ = 0, 1, 4, 5, 6)	Multicharacter output with acknowledge	
Bh ₁ h ₂ h ₃ h ₄ (h ₂ = 2, 3, 6, 7)	Multicharacter output with echo	
Bh ₂ h ₃ h ₄ (h ₂ = 8, 9, C, D)	Multicharacter output (each character requested)	
BAh ₂ h ₃ h ₄	Multicharacter verify	
Ch ₂ h ₃ h ₄ (h ₂ = 2, 6)	Multicharacter input	
Ch ₂ h ₃ h ₄ (h ₂ = 0, 1, 4, 5)	Multicharacter input with echo	
Ch ₂ h ₃ h ₄ (h ₂ = 8 through F)	Multicharacter input (each character requested)	
Fh ₂ h ₃ h ₄ (h ₂ = 0, 1, 4, 5, 8, 9, C, D)	Telecommunications input	

Codes 0... through 9... which do not require a data buffer can be used any number of times in a microcommand sequence. Only one code A... through F... from a category which requires a data buffer can be used in a given microcommand sequence.

SYSTEM 2200



MICROCOMMANDS

WANG

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