

■ Keyboard interface

Target normal, high resolution, PC-98LT / HA

Tip 8251A (equivalent)

Explanation o In the PC-9800 series, the key input information on the keyboard is a serial signal.

It is sent to the main body at (fixed at 19200bps). Keyboard I / F 8251A (equivalent) is a key input

Upon receiving the information, an INT 09h interrupt is generated and the key input is software.

Notify (BIOS, etc.).

o Even with models with integrated keyboard and main unit, such as 98NOTE, PC-98LT, HA, etc.

The keyboard and keyboard I / F communicate serially in the same way as a desktop machine.

With the u 98NOTE series, you can connect a full keyboard to the numeric keypad connector.

It is possible.

o In the PC-9800 series, the TXD signal line of 8251 is RST # (keyboard connector pin 1).

Connected to and originally used for keyboard reset, but with a new key

The board now uses this to send commands.

o For models equipped with a new keyboard, it is possible to send commands to the keyboard.

can. [CAPS], [Kana], [NUM] Key lock status acquisition and lock status control,

You can change the key repeat interval.

o The following keyboards are valid for the PC-9800 series.

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-----+-----
Old keyboard |
+-----+-----
PC-98LT | [BS], [ROLL UP], [ROLL DOWN], [DEL], [HELP], [COPY]
| | There is no key, but you can substitute it with the following operation.
| | [BS], [DEL] = [DEL BS]
| | [HELP] = [CTRL] + [SHIFT] + [H]
| | [ROLL UP] = [CTRL] + [SHIFT] + [↑]
| | [ROLL DOWN] = [CTRL] + [SHIFT] + [↓]
| | [COPY] = [CTRL] + [SHIFT] + [P]
+-----+-----
| High resolution | PC-98XA / XL / XL ^ 2
+-----+-----
| No NFER | PC-9801 1st generation · E · F · M
+-----+-----
| Others | PC-9801 Other than the first generation, E, F, M
+-----+-----
New keyboard |
+-----+-----
| 98NOTE | 98NOTE series
+-----+-----
| PC-9801-98 | Easy keyboard
+-----+-----
| PC-9801-106 | 98 Standard keyboard (Windows key, no menu key)
+-----+-----
| PC-9801-114 | PC-PTOS keyboard
+-----+-----
| PC-9801-115 | Bungo DP Keyboard
+-----+-----
| PC-9801-116 | 106 keyboard
+-----+-----
| PC-9801-119 | 98 Standard keyboard (Windows key, menu key available)
+-----+-----
| Others | Equivalent to PC-9801-106, PC-9801T-03
+-----+-----

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Related I / O 0000h bit 1

INT 18h --Function 00 ~ 09h

INT 09h (external interrupt)

0000: 0502 ~ 053Ah

I / O 0041h

Name keyboard interface

function

[READ] Read received data

bit 7-0: Make / Break Code, Status

00-7Fh = Makeup code

80 ~ FFh = Break code

FAh = ACK

FCh = NACK

[WRITE] Write transmission data

bit 7-0: Down command

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-----+-----
Command | Contents
+-----+-----

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95h | Extended key setting ■ [PC-9801-98 · 119] (Undocumented)

| * Output parameters in the 2nd byte

| bit 7 ~ 0:

| 00h = Normal

| 03h = Windows key, application key valid

| ■ [PC-9801-119]

96h | Mode identification ■ [PC-9801-98] (Undocumented)

| * A0h, 86h is returned in automatic conversion mode

| * A0h, 85h is returned in normal mode

99h | Unknown (Undocumented)

| * FBh is returned

9Ch | Keyboard repeat speed setting (Undocumented)

| * Output parameters in the 2nd byte

| bit 7: unused

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| bit 6,5: Delay
| 11b = 1000ms
| 10b = 500ms
| 01b = 500ms (default)
| 00b = 250ms
| bit 4 ~ 0: Repeat speed
| 11111b = lowest speed
| 00001b = fastest (default)
+-----+
9Dh | Unknown ■ [PC-9801NS / T] (Undocumented)
| * Output parameters in the 2nd byte
| 00h = Unknown
| 01h = Unknown
+-----+
9Dh | Keyboard LED reading (Undocumented)
| * Send 60h to the 2nd byte
| * LED status is sent in the following format
| bit 7-4: unused
| bit 3: [Kana] LED
| bit 2: [CAPS] LED
| bit 0: [NUM] LED
| 1 = ON
| 0 = OFF
+-----+
9Dh | Keyboard LED settings
| * Output parameters in the 2nd byte
| bit 7-4: Always 0111b
| bit 3: [Kana] LED
| bit 2: [CAPS] LED
| bit 0: [NUM] LED (Undocumented)
| 1 = ON
| 0 = OFF
+-----+
9Eh | Unknown (Undocumented)
+-----+
9Fh | Keyboard type identification
| * A0h, 80h is returned on the new keyboard
+-----+

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Explanation o Get the make / break code from the keyboard.

o Issue a downlink command to the keyboard.

Related I / O 0041h

I / O 0043h

Name keyboard interface

function

[READ] ■ Meaning of bits when reading status

bit 7: DSR input terminal

1 = HIGH level

0 = LOW level

* Indicates the status of pin 6 of the keyboard connector. (Undocumented)

bit 6: SYNC / BRK

1 = Break detection

0 = None

* Does not occur as long as you have a regular handshake with the keyboard.

bit 5: Framing error (FE) detection

1 = Yes

0 = None

bit 4: Overrun error (OE) detection

1 = Yes

0 = None

* Does not occur as long as you have a regular handshake with the keyboard.

bit 3: Parity error (PE) detection

1 = Yes

0 = None

bit 2: TxEMP (end of transmission)

bit 1: RxRDY (data reception)

bit 0: TxRDY (can be sent)

[WRITE] ■ Meaning of bits when writing command words

bit 7: enter hunt phase

* Do not use the keyboard I / F because it is synchronized communication. Set to 0.

bit 6: 8251A reset

1 = do

0 = No

bit 5: RTS terminal control

1 = RDY # signal line is always inactive

0 = RDY # signal line follows the state of RxRDY

* For keyboard I / F, RDY # signal line (keyboard connector pin 3)

Control the operation. It has the following meaning.

bit 4: Clear error flag

1 = Clear FE, OE, PE of 8251A

0 = Do not clear the error

bit 3: TxDATA break transmission

1 = RST # Set signal line to LOW level

0 = RST # Set signal line to HIGH level

* For keyboard I / F, RST # signal line (keyboard connector pin 1)

Control the operation. RST # signal line to LOW level for a period of 13 μs or more

Then, the CPU in the keyboard is reset.

bit 2: Acceptance

1 = Receive data from the keyboard

0 = No data received from keyboard

* The keyboard I / F operates as follows.

bit 1: DTR signal

1 = Set RTY # signal to HIGH level

0 = RTY # Set signal to LOW level
* For keyboard I / F, RTY # signal line (keyboard connector pin 5)
Control the operation. Usually HIGH. When LOW, the data on the keyboard
Request a resend.

bit 0: Send permission

1 = RST # Send data from signal line
0 = RST # Do not send data from the signal line

* On the keyboard I / F, issue a downlink command for the keyboard.
When using the RST # signal line. Set to 1 when sending a command.

[WRITE] ■ Meaning of bits when mode is written

bit 7,6: ST2, ST1 (number of transmission stop bits)

Set 01b (1 bit)

bit 5,4: P1, P0 (parity generation / check)

Set 01b (odd parity)

bit 3,2: L1, L0 (character length)

Set 11b (8 bits)

bit 1,0: B1, B0 (baud rate)

Set 10b (16x clock)

Explanation o Set the mode of the 8251 equivalent used for the keyboard interface.

Related I / O 0043h