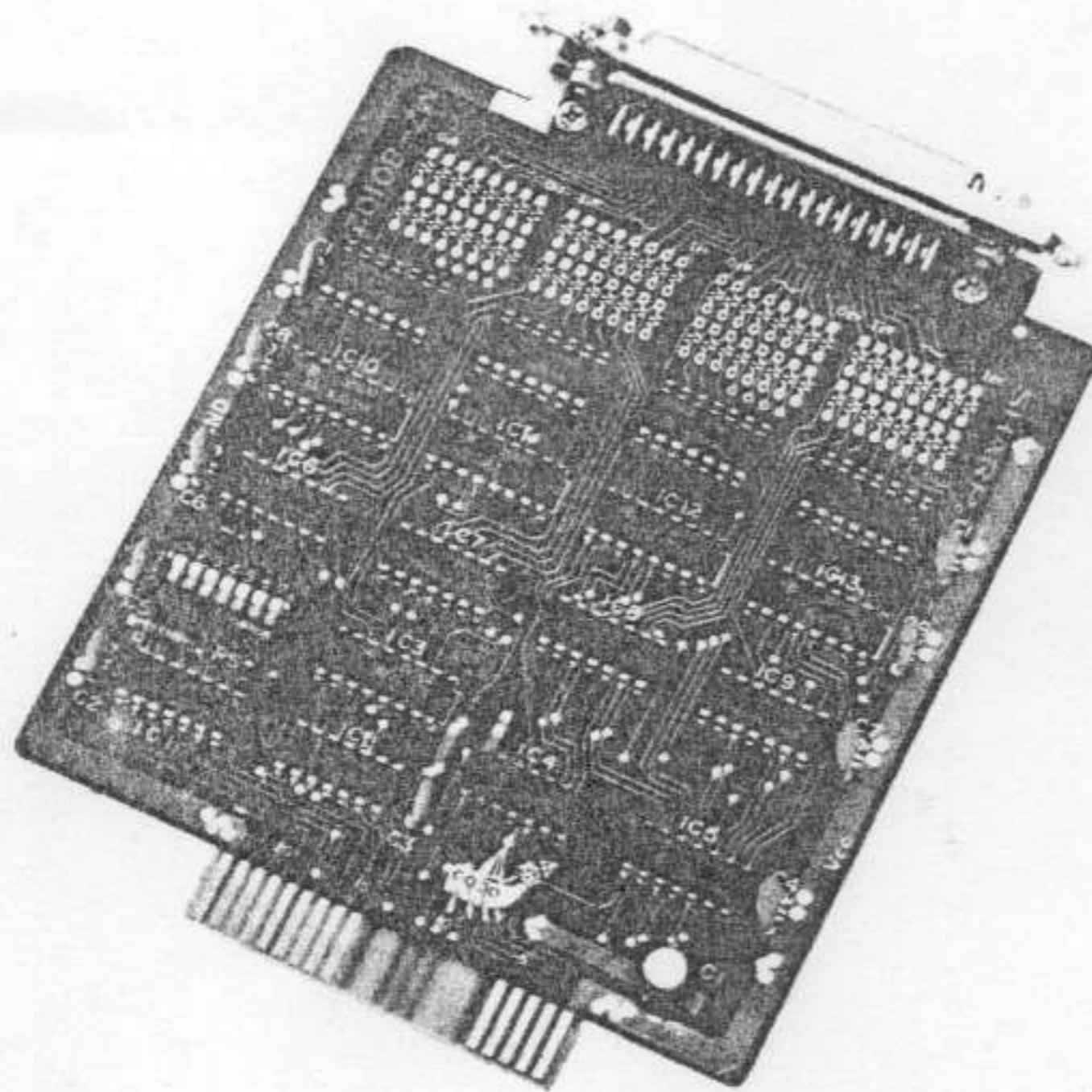


UNIVERSAL INTERFACE CARD

Model **11Z-80102**

Instruction Manual



SHARP CORPORATION

Introduction

Thank you very much for purchasing Sharp Universal Interface Card.

Read this instruction manual carefully before using the card.

We hope you will use it to its fullest potential.

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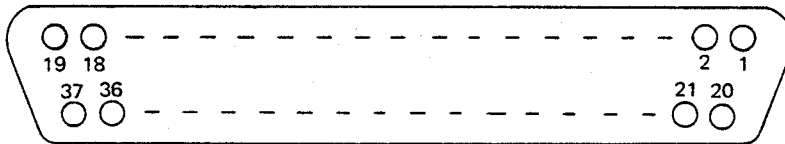
What is a Universal Interface Card?

This card is a circuit board that is available for 8 bits parallel interface. The card is inserted into any connector of Sharp Extension Unit MZ-80EU which is installed in Sharp Personal Computer MZ-80B, and is used for interface between MZ-80B and your peripheral device. For details of connection, refer to the manual for MZ-80B.

Port address can be set up by a port address selector on the board. However, this card needs some modification -- wiring, soldering, etc. -- to match use.

How to use

- (a) On the standard board, there are ICs 7404N that are mounted in the IC sockets at the output stage of output port. However, *1) these ICs should be changed with the following ICs in response to the load condition. 7405N, 7406N, 7407N, 7416N, 7417N, etc.
- (b) Resistors at input/output stage
At the input/output stage, pull-up, pull-down or terminal resistors can be mounted on the board. *2) You should mount suitable resistors in response to load conditions.
- (c) Input/output terminal connector
The card has a input/output terminal connector. Each pin is numbered as follows. For correspondence between each signal and pins, refer to the circuit diagram.



- (d) Port address setting
Port address setting depends on a port address selector (marked with "PS") that consists of multiple switches. The numbers described on the selector correspond to the following address bus respectively.

Switch No.	7	6	5	4	3	2	1
Address bus	A ₇	A ₆	A ₅	A ₄	A ₃	A ₂	A ₁

The OFF condition of a switch corresponds to logic "1", and the ON condition to logic "0". For example, when setting up a port address to decimal value (100)₁₀, the condition of each switch will be as follows.

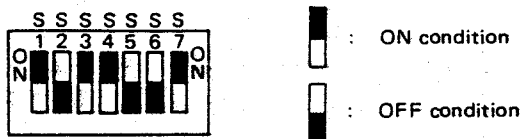
Switch No.	7	6	5	4	3	2	1
Condition	ON	OFF	OFF	ON	ON	OFF	ON

Because the decimal value (100)₁₀ is binary value (01100100)₂.

$$(100)_{10} = (0 \quad 1 \quad 1 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0)_2$$

$\begin{matrix} \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ S_7 & S_6 & S_5 & S_4 & S_3 & S_2 & S_1 & A_0 \end{matrix}$

Therefore, the condition of the selector should be as illustrated below.



Port address range can be 0 to 255 (00H to FFH). *4) However, you should specify a port address in the range 0 to 127 (00H to 7FH).

- (e) Port address
- | | | |
|------------------------------------|---------------|----------------|
| I ₁₀ to I ₁₇ | (input port) | : even address |
| I ₂₀ to I ₂₇ | (input port) | : odd address |
| O ₁₀ to O ₁₇ | (output port) | : even address |
| O ₂₀ to O ₂₇ | (output port) | : odd address |

- (f) Control
BASIC SB-5510 or SB-6510 has the following input/output commands.

INP @PORT, X

This command means that 8 bits data is input from the specified port address "PORT" and then is set to variable X as decimal value (0 to 255).

OUT @PORT, X

This command means that value X (0 to 255) is output to the specified port address "PORT" as 8 bits binary value. With executing the above command, the port address code is changed to a binary code, which is output to address bus A₀ to A₇.

I/O control can be also available with Z80 machine language.

*** Notes ***

Incorrect operation may damage the card. Pay special attention to the modifications and handling.

- *1) Always insert the ICs in the correct direction when changing other ICs. Reverse insertion damages them.
- *2) Do not use unsuitable pull-up, pull-down or terminal resistor.
- *3) Do not use two or more interface cards with the same port address at a time. ICs may be broken because of the correspondence of port address.
- *4) Port addresses 80H to FFH will be occupied with Sharp optional peripherals etc.
- *5) We assume no responsibility for any trouble which is caused by the universal interface cards altered by the user.

Specifications

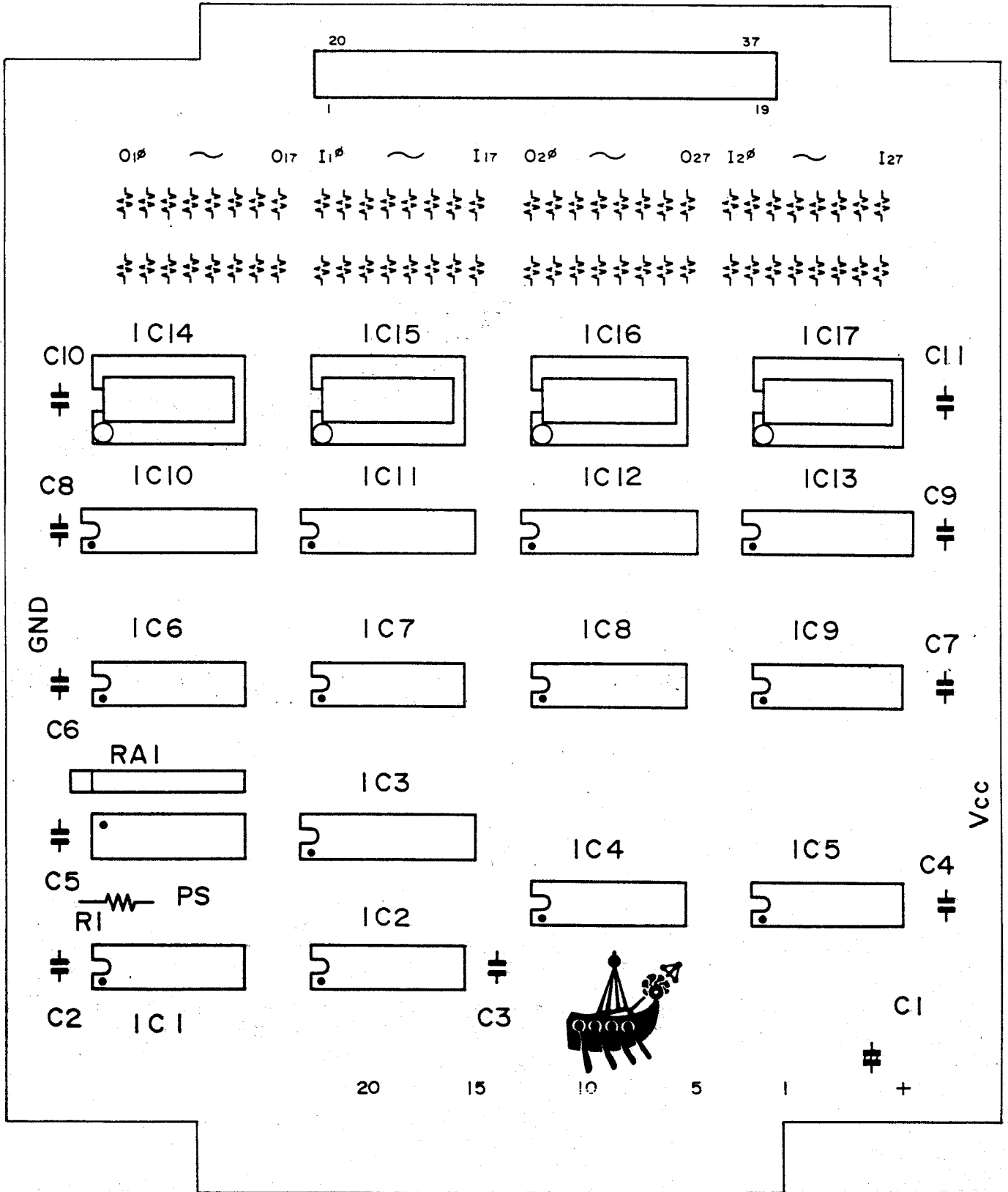
- (1) Number of ports
Input : 2 ports
Output : 2 ports
- (2) Port address setting
Whole address setting possible
- (3) Connection with bus line

Bus	Symbols	IC used
Data bus	D ₀ to D ₇	LS04N, LS125N
Address bus	A ₀ to A ₇	LS266N
Control bus	\overline{IOREQ} RD WR RESET	LS266N LS42N LS42N LS04N

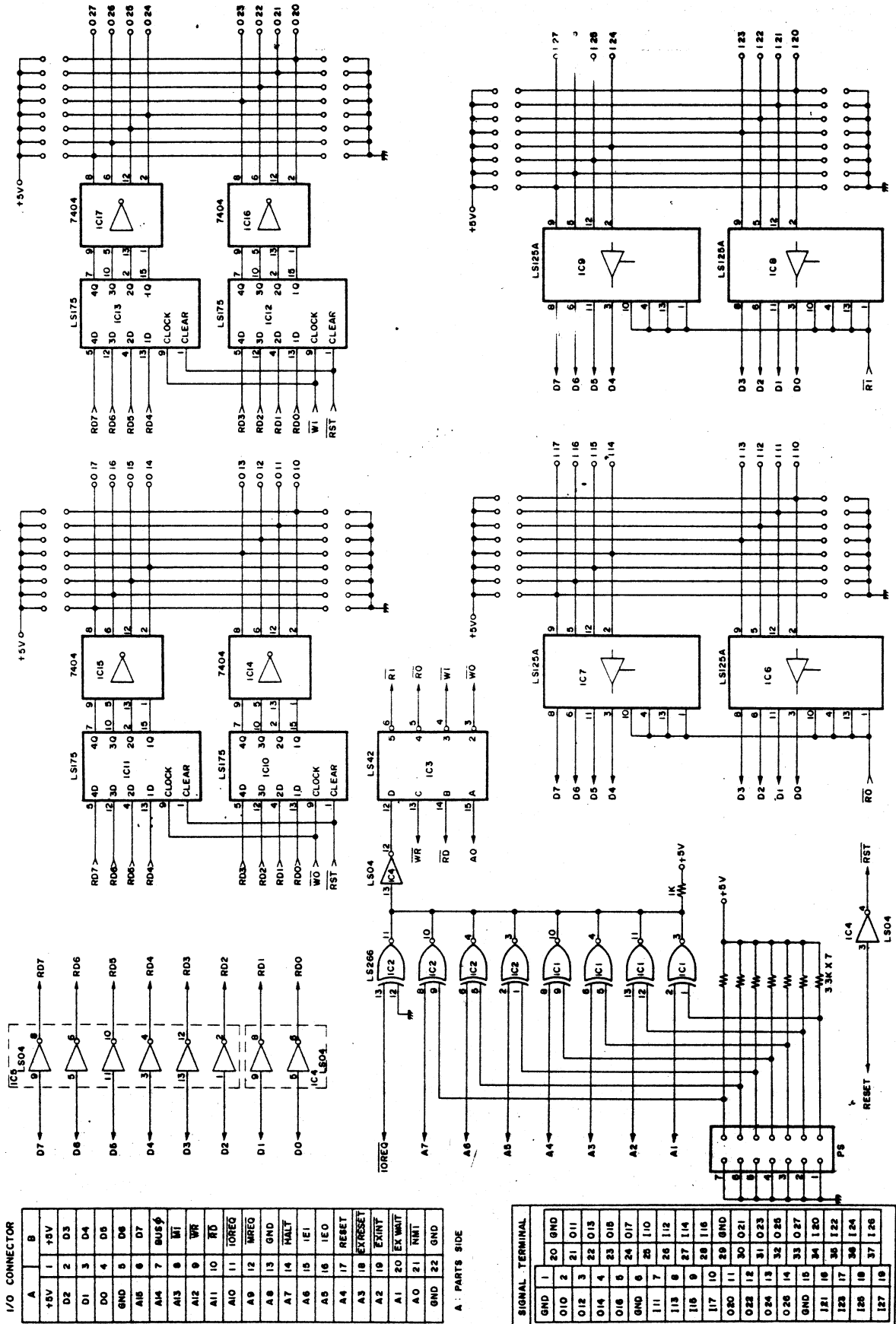
Each signal is as per TTL level. The electrical specifications are in accord with those of ICs employed.

- (4) Port input
TTL level, non latch system
Signals are input to the data bus via IC LS125 with the same logic. The electrical specifications are in accord with those of IC LS125.
- (5) Port output
TTL level, latch system
Signals are output via IC 04 with the same logic.
The electrical specifications are in accord with those of IC 04.
- (6) Bus line terminals and ICs used
Refer to the Circuit Diagram.
- (7) Operating temperature
0 to 35°C
- (8) Storage temperature
-15 to 60°C
- (9) Power source
DC +5V (supplied from Personal Computer MZ-80B)

Parts arrangement pattern



Circuit diagram



I/O CONNECTOR

A	B
+5V	1 +5V
D2	2 D3
D1	3 D4
DO	4 D6
D8	5 D8
A16	6 D7
A14	7 BUS
A13	8 INT
A12	9 WR
A11	10 RD
A10	11 IOREG
A9	12 MREG
A8	13 GND
A7	14 HALT
A6	15 IEI
A5	16 IEO
A4	17 REREI
A3	18 EXRESET
A2	19 EXINT
A1	20 EXWMT
A0	21 INT
GND	22 GND

A: PARTS SIDE

SIGNAL TERMINAL	
GND	1
O10	2
O12	3
O14	4
O16	5
GND	6
I11	7
I13	8
I16	9
I17	10
O20	11
O22	12
O24	13
O26	14
GND	15
I21	16
I23	17
I25	18
I27	19

UNIVERSAL I/O CARD