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April 1st, 2010
Renesas Electronics Corporation

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RENESAS

USER'S MANUAL

Phase-out/Discontinued

IE-78000-R-BK

BREAK BOARD

Document No. EEU-1427B
(O. D. No. EEU-867B)
Date Published April 1994 P
Printed in Japan

USER'S MANUAL

NEC

Phase-out/Discontinued

IE-78000-R-BK

BREAK BOARD

Main revisions in this edition

Pages	Description
p.12-15	Addition of following subseries for target device to table B-1. • uPD78024 subseries (under development) • uPD78098 subseries (under development)

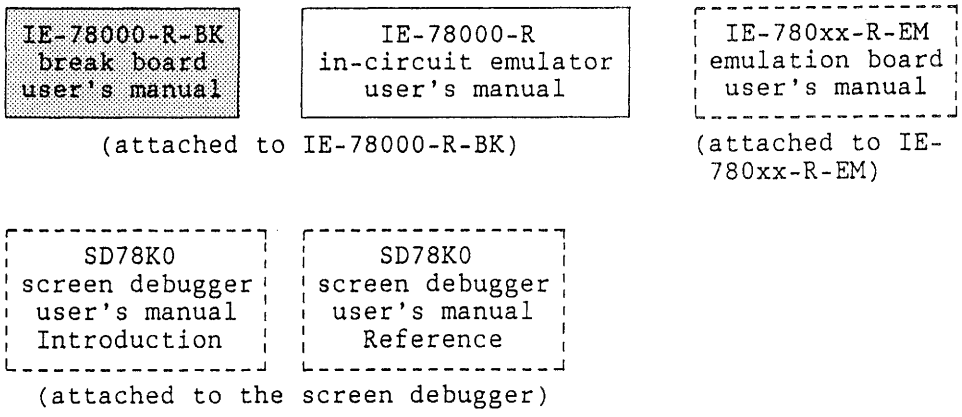
PREFACE

Product outline: IE-78000-R-BK is connected together with an emulation board (IE-780xx-R-EM) to an in-circuit emulator for use to debug the 8-bit single chip microcomputer 78K/0 series.

Target: The manual is intended for the engineer who adopts the 78K/0 series and connects IE-78000-R-BK and an emulation board to an in-circuit emulator for system debugging.

IE-78000-R-BK has a capability of emulating the 78K/0 series. The manual assumes that the reader is familiar with the function and use of the 78K/0 series and has a knowledge of a debugger.

Composition: The manuals required to use IE-78000-R-BK are the manuals attached to IE-78000-R-BK (the present manual and IE-78000-R User's Manual), the user's manual of an optional emulation board (IE-780xx-R-EM), and the manuals attached to the optional screen debugger (Introduction and Reference).



Purpose: The purpose of the manual is for the user to understand the basic specifications and correct connection method of IE-78000-R-BK.

Use:

- ◉ To understand the basic specifications
- ⊟ Read Chapter 1.
- ◉ To connect emulation board
- ⊟ Read Chapter 2 and the user's manual of the emulation board.

Terminology: The meanings of the terms used throughout the manual are listed below:

Term	Meaning
Emulation device	General term for devices which emulate the target device within the emulator. It contains the emulation CPU.
Emulation CPU	CPU which executes user-prepared programs within the emulator.
Target device	Emulation target device (present chip).
Target program	Program to be debugged (user-prepared program).
Target system	System to be debugged (user-prepared system) It contains the target program and user-prepared hardware. In a narrow sense, it indicates only the user-prepared hardware.

It the manual, the in-circuit emulator containing the IE-78000-R-BK is called IE-78000-R and other in-circuit emulators than IE-78000-R are called in-circuit emulators.

Legend:

Note:	Explanation of (Note) in the text
Caution:	Caution to which you should pay attention
Remarks:	Supplementary explanation to the text

CONTENTS

CHAPTER 1 GENERAL DESCRIPTION

IE-78000-R-BK is a break board for the IE-78000-R development system of the 78K/0 series 8-bit single chip microcomputer. You can combine this break board and optional emulation board, emulation probe, etc., for efficient emulation of the 78K/0 series with your in-circuit emulator.

1.1 Features

If you already have any in-circuit emulator of the 75K series, 78K/I series, 78K/II series, 78K/III series, or 78K/VI series, you can use it as an in-circuit emulator which has the function equivalent to IE-78000-R by replacing the break board connected to the cabinet with IE-78000-R-BK.

To develop 78K/0 series products, an emulation board, emulation probe, screen debugger, device file, etc., are required in addition to IE-78000-R-BK. Purchase them as required.

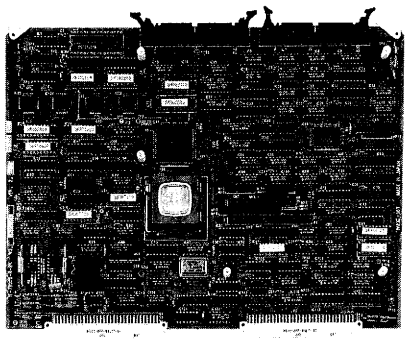
1.2 IE-78000-R-BK Components

Check the names and quantity of IE-78000-R-BK components against the following:

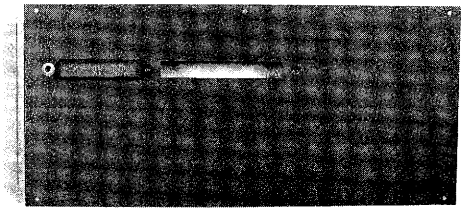
(1)	IE-78000-R-BK	One board
(2)	Top cover of in-circuit emulator	One
(3)	Flat cable (J1, J2 cable)	Two
(4)	User's manual	Two (the present manual and IE-78000-R manual)

Fig. 1-1 List of IE-78000-R-BK Components

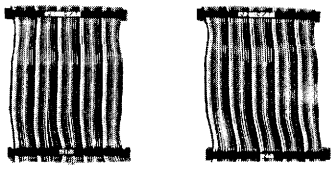
(1) IE-78000-R-BK



(2) Top cover of in-circuit emulator

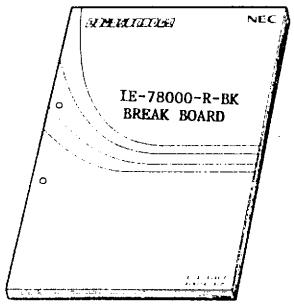


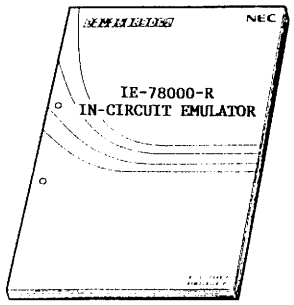
(3) Flat cables (J1 and J2 cables)



(4) User's manuals

(present manual)





1.3 Appearance and Parts Names of IE-78000-R-BK

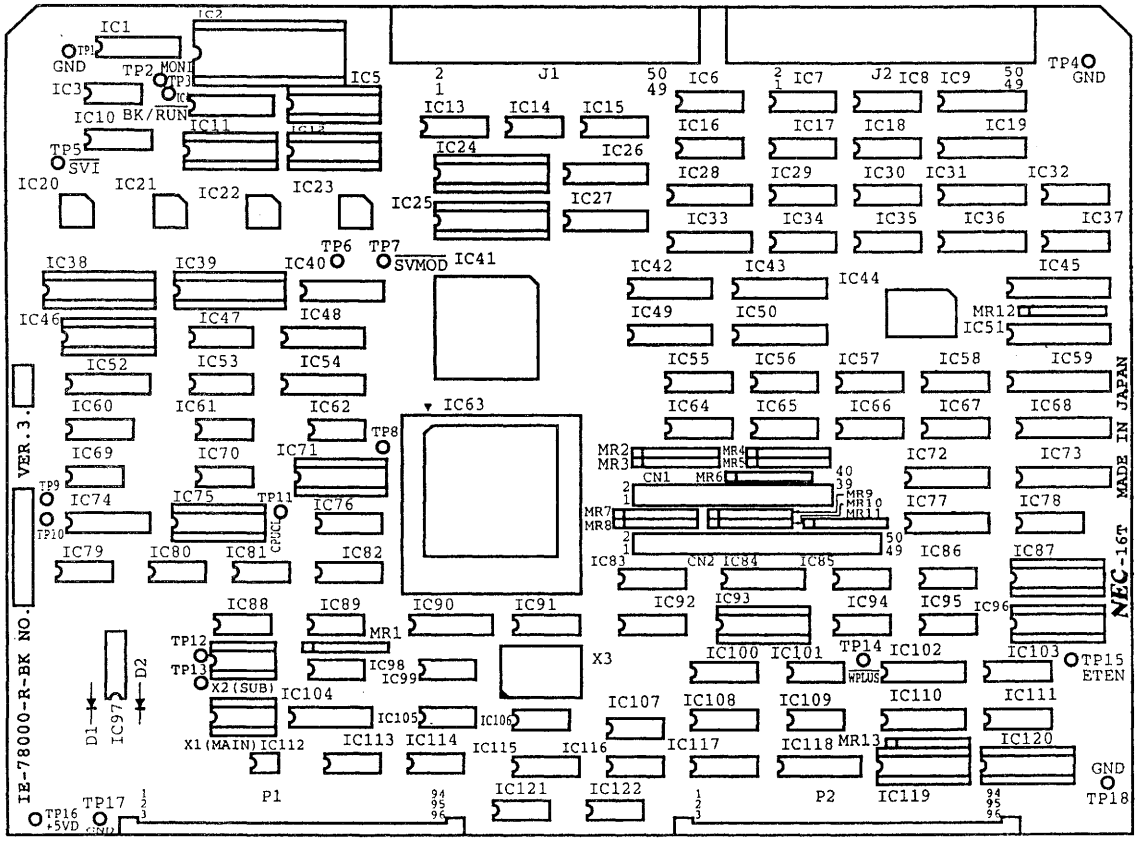


Table 1-1 IE-78000-R-BK Parts Names

Name	Function
J1	Control/trace board connection connector
J2	
CN1	Emulation board connection connector
CN2	
X1	Parts pad socket for main system clock
X2	Parts pad socket for sub-system clock
P1	Mother bus connection connector
P2	

1.4 Target In-circuit Emulator

The following in-circuit emulators can be used with IE-78000-R-BK:

Series name	In-circuit emulator
75X series	IE-75000-R(Note), IE-75001-R
78K/I series	IE-78130-R, IE-78140-R
78K/II series	IE-78230-R(Note), IE-78230-R-A, IE-78240-R(Note), IE-78240-R-A
78K/III series	IE-78320-R(Note), IE-78327-R, IE-78330-R, IE-78350-R
78K/VI series	IE-78600-R(Note)

Note: Maintenance product (cannot be purchased)

CHAPTER 2 INSTALLATION PROCEDURES

This chapter explains the procedures for connecting IE-78000-R-BK and the following for installation of 78K/0 series development system:

- in-circuit emulator main unit;
- emulation board;
- connector board and emulation probe.

Turn off the in-circuit emulator power and target system power before connecting or removing the devices.

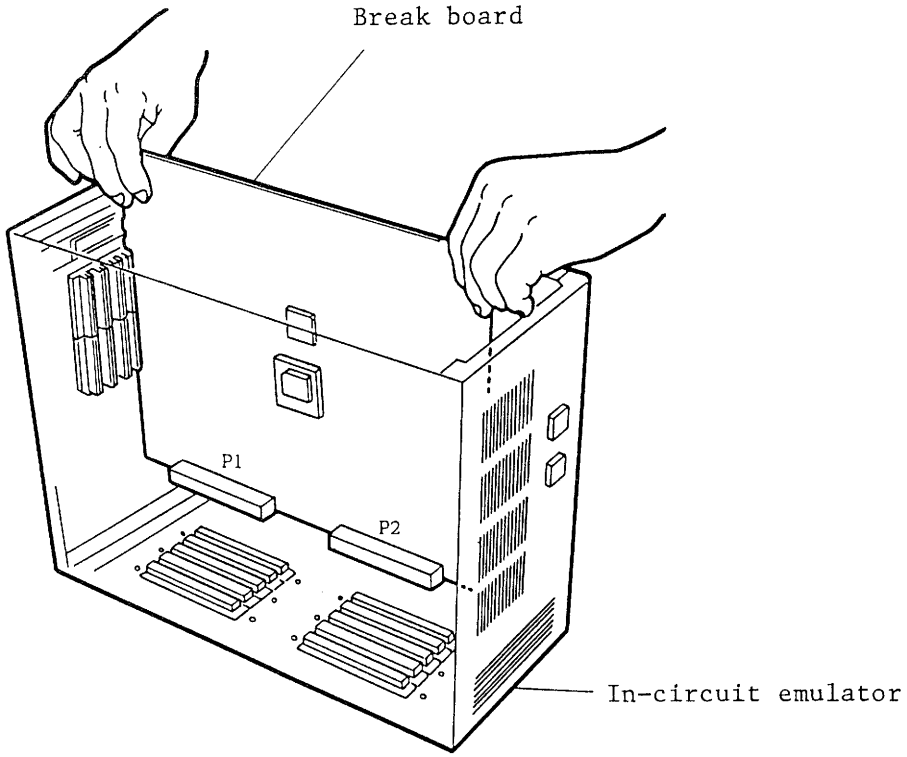
Refer to Chapter 5 of IE-78000-R User's Manual for the connection method of the emulation probe and target system.

Remove the break board in your in-circuit emulator and connect IE-78000-R-BK instead. Connect IE-78000-R-BK and the in-circuit emulator, emulation board, connector board, and emulation probe as described below:

(1) Unscrew the six screws on the top of the in-circuit emulator main unit and open the cover.

(2) Remove the J1 and J2 cables connecting the control/trace board and break board.

(3) Pull the card pullers at both ends of the break board toward you and draw the break board from the slot. Store the drawn out break board carefully, paying attention to static electricity.



(4) Connect IE-78000-R-BK and the emulation board. (Refer to the Emulation Board Manual.)

Caution: Be sure to check to ensure that CN1 and CN2 are properly placed.

(5) To use user clock, mount the clock by using a parts pad for the break board. (See Chapter 3 in the IE-78000-R User's Manual.)

(6) Connect the connector board attached to the emulation probe to the emulation probe.

(7) Connect IE-78000-R-BK to the mother board slot of the in-circuit emulator (IE-78000-R-BK is the second slot from your left to right and the emulation board is the third slot).

(8) Connect IE-78000-R-BK and the control/trace board with the accessory cables J1 and J2.

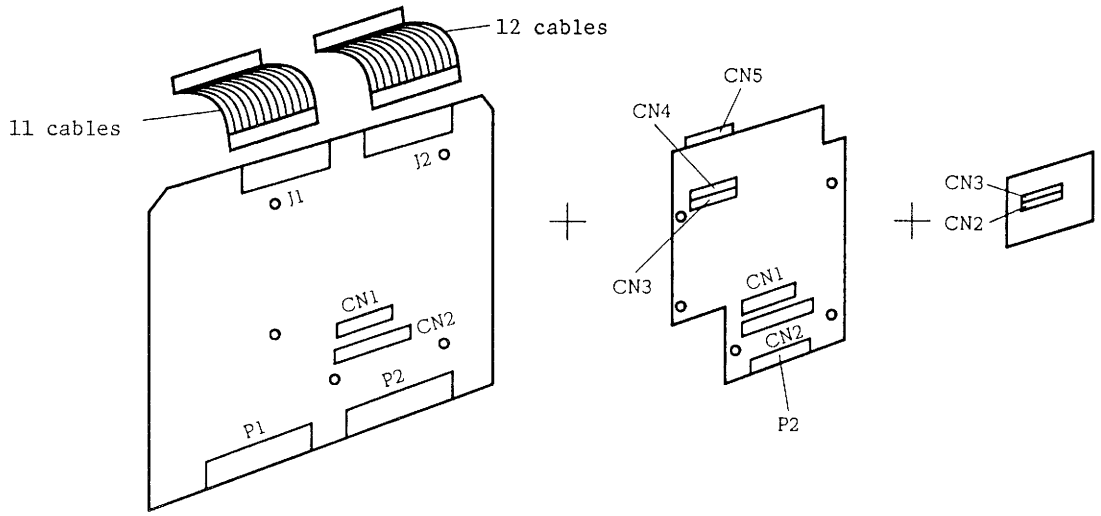
(9) Check the board position and use the accessory cover to close the cover.

(10) Connect connector CN5 on the top of the in-circuit emulator main unit and the emulation probe connector CN5 and screw in the connector.

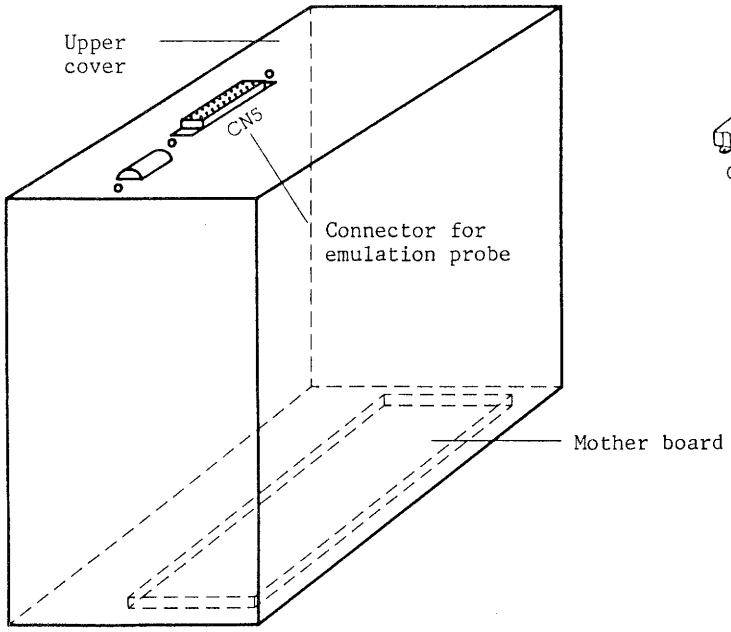
IE-78000-R-BK

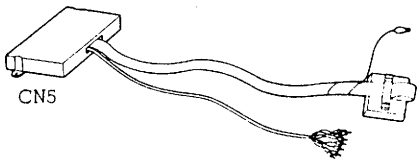
Emulation board

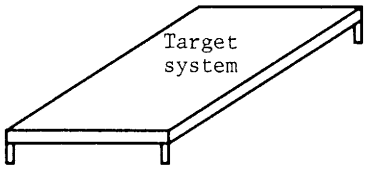
Connector board (attached to emulation probe)



Emulation probe corresponding to each package



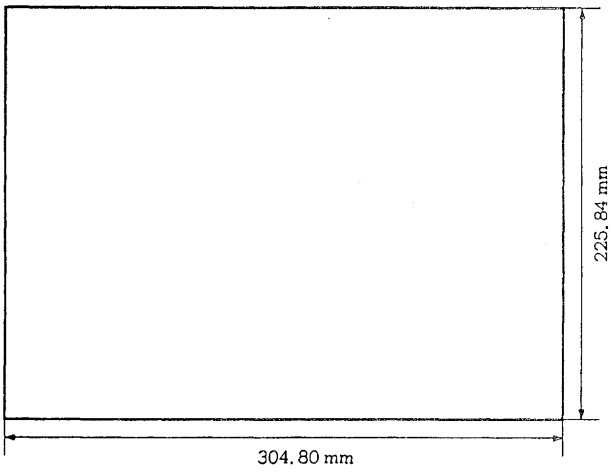




In-circuit emulator

APPENDIX A IE-78000-R-BK PRODUCT SPECIFICATIONS

Product name: IE-78000-R-BK
Emulation device: uPD78009
Operation temperature: 0 to 50°C
Humidity: 20 to 80%RH (no dew condensation must occur)
Storage temperature: -20 to +60°C
Power supply: Supply from power source built into in-circuit emulator
Printed circuit board dimensions:



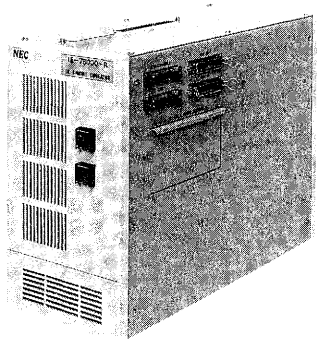
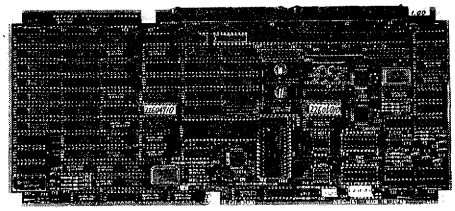
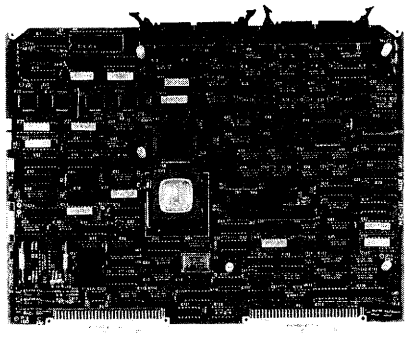
Connectors: Connectors on IE-78000-R-BK

Name	Function
J1	Control/trace board connection connector
J2	
CN1	Emulation board connection connector
CN2	
X1	Parts pad socket for main system clock
X2	Parts pad socket for sub-system clock
P1	Mother bus connection connector
P2	

APPENDIX B SYSTEM COMPONENT LIST

The IE-78000-R system components are listed below:

Table B-1 IE-78000-R System Component List (1/4)

Target device	Cabinet and control/trace board	Break board
uPD78002 subseries uPD78002Y subseries uPD78014 subseries uPD78014Y subseries uPD78024 subseries uPD78044 subseries	 78K series common cabinet (with power source)  IE-78000-R-CS-A (78K series common control/ trace board)	 IE-78000-R-BK (78K/0 series common break board)

Caution: uPD78024 subseries are under development.

Table B-1 IE-78000-R System Component List (2/4)

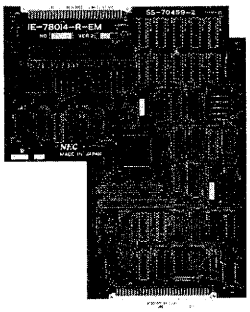
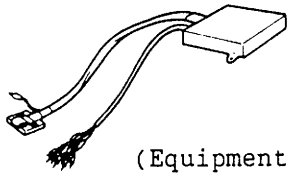
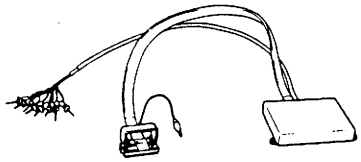
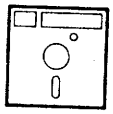
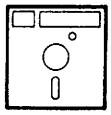
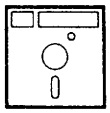
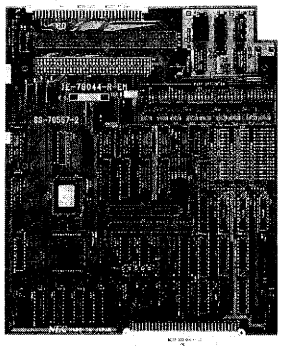
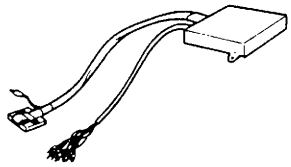
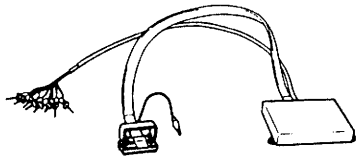
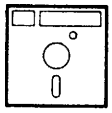
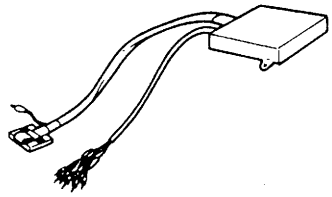
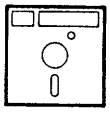
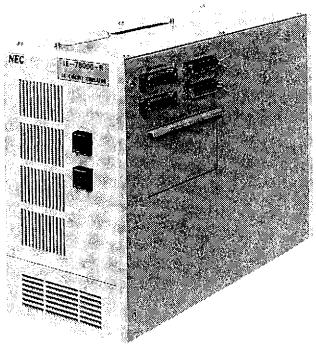
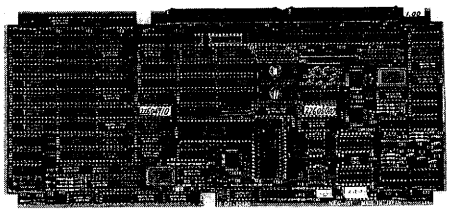
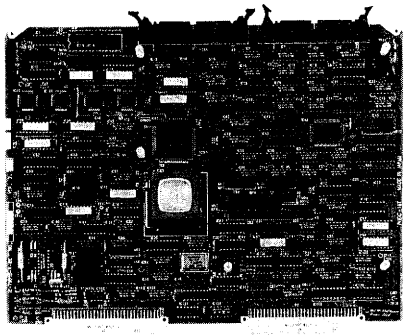
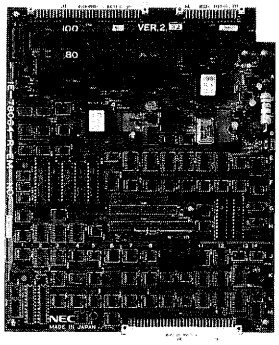
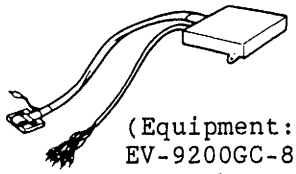
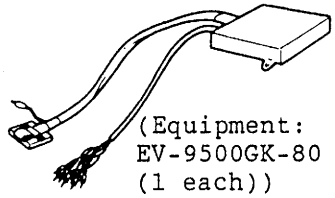
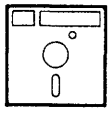
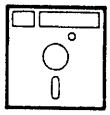
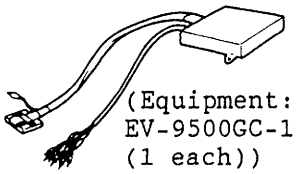
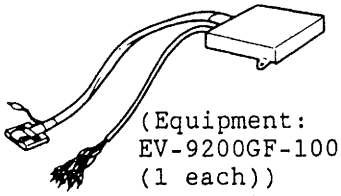
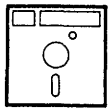
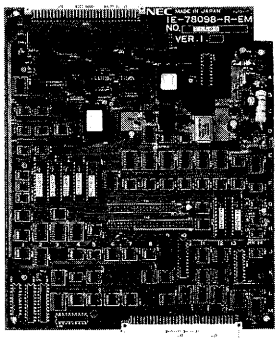
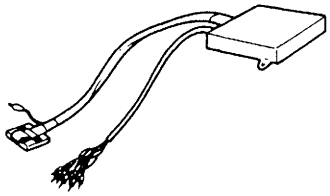
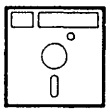
Emulation board (optional)	Emulation probe (optional)	Screen debugger (optional)	Device file (optional)
 IE-78014-R-EM	 (Equipment: EV-9200GC-64 (1 each)) EP-78240GC-R  EP-78240CW-R	 SD78K0 (with ROM)	 DF78002  DF78014
 IE-78044-R-EM	 (Equipment: EV-9200G-64 (1 each)) EP-78024GF-R  EP-78024CW-R		 DF78024
	 (Equipment: EV-9200G-80 (1 each)) EP-78130GF-R		 DF78044

Table B-1 IE-78000-R System Component List (3/4)

Target device	Cabinet and control/trace board	Break board
uPD78054 subseries uPD78064 subseries uPD78098 subseries	 78K series common cabinet (with power source)  IE-78000-R-CS-A (78K series common control/ trace board)	 IE-78000-R-BK (78K/0 series common break board)

Caution: uPD78055, 78056, 78058, 78P058, 78062, 78P064 and 78098 subseries are under development.

Table B-1 IE-78000-R System Component List (4/4)

Emulation board (optional)	Emulation probe (optional)	Screen debugger (optional)	Device file (optional)
 IE-78064-R-EM	 (Equipment: EV-9200GC-80 (1 each)) EP-78230GC-R  (Equipment: EV-9500GK-80 (1 each)) EP-78054GK-R	 SD78K0 (with ROM)	 DF78054
	 (Equipment: EV-9500GC-100 (1 each)) EP-78064GC-R  (Equipment: EV-9200GF-100 (1 each)) EP-78064GF-R		 DF78064
 IE-78098-R-EM	 (Equipment: EV-9200GC-80 (1 each)) EP-78230GC-R		 DF78098

This device is an information device of the first kind (information device which should be used in a commercial districtindustrial area) and conforms to the (VCCI) standard intendeinhibit jamming in a commercial district or industrial area.
If you use the device in a residential district or its contiguous district, it may give radio disturbance to radio receivers, television sets, etc.
Handle the device correctly as described in the user's manual.


Phase-out/Discontinued