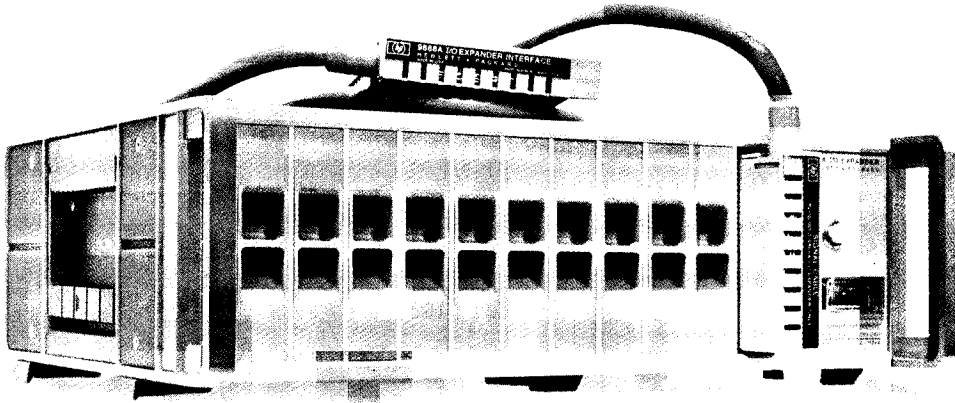


# OPERATING MANUAL



## 9868A I/O EXPANDER

HEWLETT-PACKARD CALCULATOR PRODUCTS DIVISION

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# TABLE OF CONTENTS

## CHAPTER 1. GENERAL INFORMATION

### INTRODUCTION

Supplied Equipment . . . . .	1-1
Instrument Identification . . . . .	1-1
Initial Inspection . . . . .	1-1
Service Contracts . . . . .	1-1

## CHAPTER 2. INSTALLATION AND OPERATION

### INSTALLING THE I/O EXPANDER

Power Requirements . . . . .	2-1
Grounding Requirements . . . . .	2-1
Setting the Line Voltage and Changing the Fuse . . . . .	2-2
Interface Connections . . . . .	2-4
Power Connections . . . . .	2-4

### SYSTEM OPERATION

Electrical Inspection . . . . .	2-5
Changing the Back-Panel Fuse . . . . .	2-6
Changing the Front-Panel Lamp . . . . .	2-6

## INTRODUCTION

The -hp- Model 9868A I/O Expander enables up to nine additional peripheral devices to be connected to any 9800-Series Calculator. Also, the I/O Expander contains a separately powered block of eight convenience outlets to supply power to peripheral devices or accessories.

The I/O Expander is supplied with an interface cable which permits it to be located up to six feet from the calculator; however, a longer interface cable may be ordered (price available upon request).

The following equipment is furnished with the I/O Expander.

**Table 1. Supplied Equipment**

DESCRIPTION	QUANTITY	-hp- PART NUMBER
Operating Manual	2	09868-90000
Interface Cable	1	09868-63901
Power Cords:		
AC Receptacle	1	8120-1521
Inter-instrument	1	8120-1575
Fuses:		
.75A, 250V, Normal Blo	2	2110-0033
1.5A, 250V, Normal Blo	2	2110-0043
Line Voltage Selector Card	1	5020-8122

**SUPPLIED  
EQUIPMENT**

The I/O Expander is identified by the serial number located on the instrument back panel.

**INSTRUMENT  
IDENTIFICATION**

The I/O Expander was carefully inspected both mechanically and electrically before shipment. It should be free of marks or scratches and in perfect electrical order upon receipt. Carefully inspect the I/O Expander for physical damage caused in transit; if there is any damage, file a claim with the carrier. If you wish to verify the electrical performance of the I/O Expander, see the section titled ELECTRICAL INSPECTION.

**INITIAL  
INSPECTION**

Service contracts are available for the I/O Expander. For further information contact your nearest -hp- Sales and Service Office; locations are listed at the back of this manual.

**SERVICE  
CONTRACTS**

## INSTALLING THE I/O EXPANDER

The I/O Expander will operate within a voltage range of 90 to 126 v ac or 198 to 252 v ac. The line frequency must be between 48 and 440 Hz. The I/O Expander typically requires a maximum of 120 voltamps.\*

The line voltage selector (see Figure 1), located in the power module on the front of the instrument, can be used to select a nominal operating voltage range of either 100v, 120v, 220v, or 240v. A different fuse is required for operation in either the 100–120v or 220–240v range. Information on how to set the line voltage selector and how to change fuses is presented in the following pages.

### CAUTION

DO NOT APPLY AC POWER TO THE I/O EXPANDER UNLESS THE LINE VOLTAGE SELECTOR IN THE POWER MODULE IS SET TO THE PROPER VOLTAGE. DAMAGE TO THE I/O EXPANDER CAN RESULT FROM FAILURE TO OBSERVE THIS PRECAUTION.

To protect operating personnel, the NATIONAL ELECTRICAL MANUFACTURERS' ASSOCIATION (NEMA) recommends that the I/O Expander cabinet be grounded. The I/O Expander is equipped with a three-conductor power cable which, when connected to an appropriate receptacle, grounds the cabinet of the I/O Expander. The center pin of the power cable connector is the ground connection.

### POWER REQUIREMENTS

### GROUNDING REQUIREMENTS

\*A maximum of 200 voltamps may be consumed when the line frequency is greater than 66 Hz.

**SETTING THE LINE  
VOLTAGE AND  
CHANGING THE FUSE****INSTALLING THE I/O EXPANDER**

To avoid possible damage to the I/O Expander when initially connected to a power source, the line voltage selector and a fuse are not installed when the instrument is shipped from the factory. Use the following procedure to install the line voltage selector and the appropriate fuse into the power module.

1. Slide the plastic window to the left, then pull the FUSE PULL lever out and to the left (see Figure 1).
2. Hold the line voltage selector such that only the number indicating the required line voltage setting will be visible when the card is plugged in the power module. Then push the card into the lower portion of the power module until it is firmly seated (see Figure 1).
3. Reposition the FUSE PULL lever and install the appropriate fuse by firmly pressing into the fuse clips.

**NOTE**

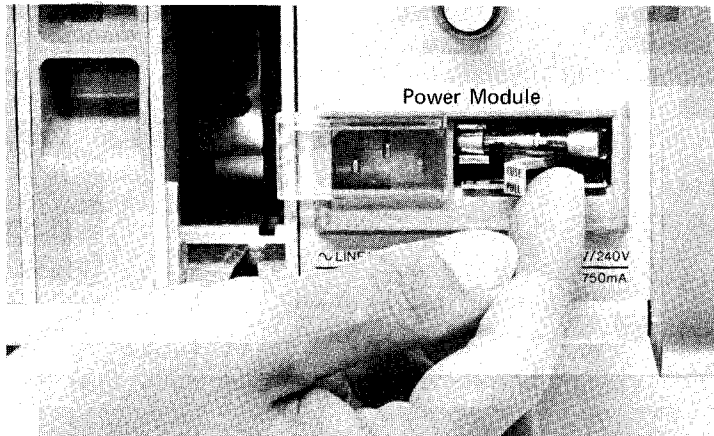
For 100–120v operation, use a 1.5 amp, normal-blo fuse, -hp- Part No. 2110-0043.

For 220–240v operation, use a .75 amp, normal-blo fuse, -hp- Part No. 2110-0033.

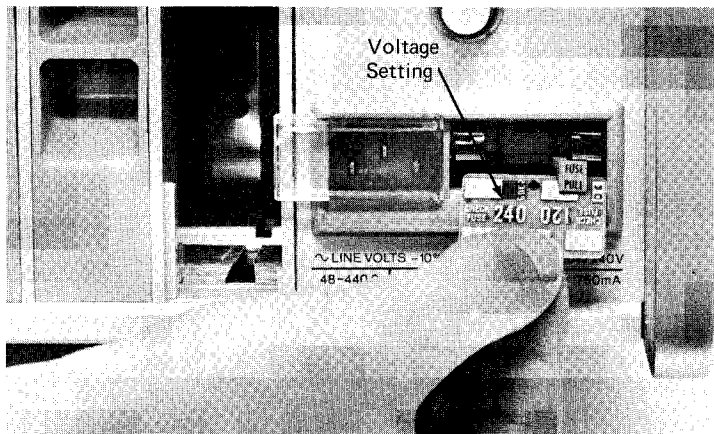
4. Slide the plastic window to the right and connect the I/O Expander to the ac power source (see 'POWER CONNECTIONS' on page 2-4).

The foregoing procedure may be used when changing the line voltage setting and changing the power module fuse; the line voltage selector is easily removed by using a pointed object, such as a ball-point pen.

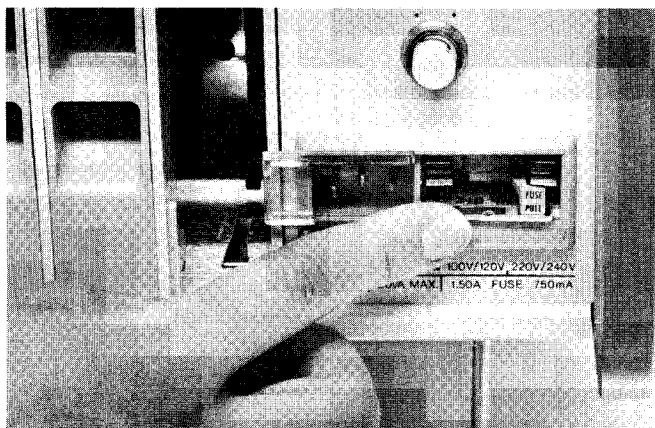
## INSTALLING THE I/O EXPANDER



1. Slide the plastic window to the left and move the FUSE PULL lever to the left (removing the fuse).



2. Position the line voltage selector such that the number indicating the required voltage setting is on the left.



3. Push the line voltage selector into the power module, insert the proper fuse, and slide the plastic window to the right.

Figure 1. The Power Module

INTERFACE  
CONNECTIONS

## INSTALLING THE I/O EXPANDER

The I/O Expander should be connected between the calculator and the peripheral devices. Be sure to switch the calculator and the I/O Expander OFF before connecting the interface cable to either instrument. The end of the interface cable (see Figure 2) marked '9868A I/O EXPANDER INTERFACE' must be plugged into one of the calculator's I/O connectors. The end of the cable marked 'SIGNAL CABLE' must be plugged into one of the I/O connectors on the I/O Expander (as shown in Figure 2). After installing the interface cable, connect the interface cable from each peripheral device to one of the I/O connectors on the I/O Expander.

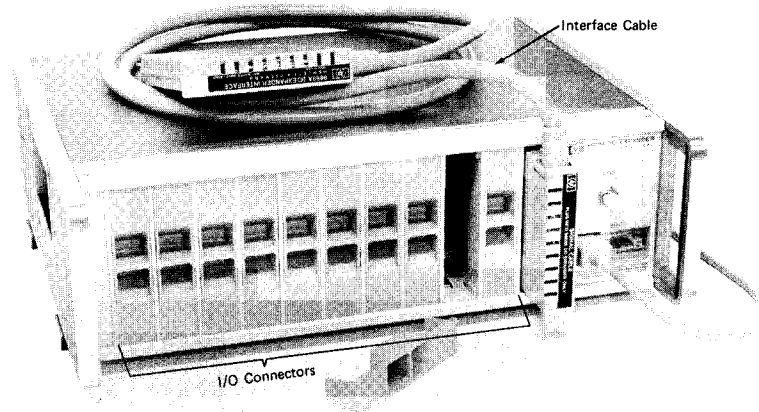


Figure 2. Details of the Front Panel

POWER  
CONNECTIONS

The I/O Expander contains two power receptacles — the front-panel receptacle supplies power only to the I/O interface and the back-panel receptacle supplies power only to the eight convenience outlets; thus, two power cords are required to operate the entire instrument. It is recommended that the I/O Expander's rear-panel power cable not be connected to the calculator, since the I/O Expander can supply more power to peripheral devices than the calculator can supply to the I/O Expander.

To connect power to the I/O Expander, connect the inter-instrument power cord (the short cord) to the front-panel power module and to one of the convenience outlets on the back panel (see Figure 3). Then connect the ac receptacle power cord to the back-panel receptacle marked 'CONVENIENCE OUTLETS ONLY' and to an ac power source (other than the calculator). If all eight convenience outlets are required for peripherals, the inter-instrument power cord may be connected from the front-panel power module to the calculator.\* The power cables from each peripheral may be connected to any convenience outlet on either the I/O Expander or the calculator.

\*An eight-foot inter-instrument power cord is available, -hp- Part No. 8120-0063.

## INSTALLING THE I/O EXPANDER

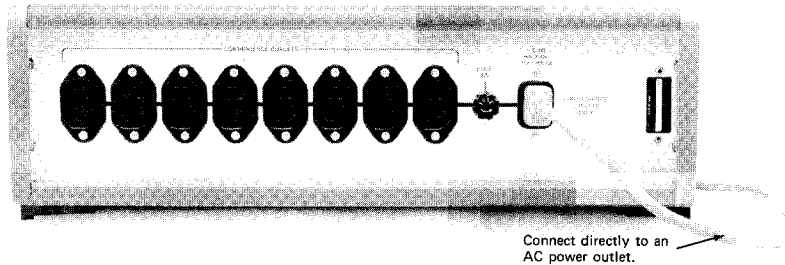


Figure 3. Details of the Back Panel

## SYSTEM OPERATION

The LINE switch on the front panel controls power to the I/O Expander's interface; the switch lens is illuminated when power is applied.

When the calculator system is connected as previously described and the I/O Expander is switched ON, the I/O Expander has no effect on operation of the calculator or the peripherals.

There is no exerciser program or special inspection procedure available to check the performance of the I/O Expander. However, if you suspect the performance of a peripheral device (or the calculator) when the I/O Expander is connected in your system, disconnect the I/O Expander and any other peripherals from the calculator; then run the calculator's electrical inspection program(s). After verifying the performance of the calculator, connect the peripheral in question directly to the calculator and perform the peripheral's electrical inspection procedure.

If a peripheral or the calculator operates correctly when the I/O Expander is not connected in the system, but the instrument operates marginally, or does not operate, when the I/O Expander is connected, the I/O Expander is probably defective. If you suspect that the I/O Expander is defective, contact the nearest -hp- Sales and Service Office for assistance; office locations are listed at the back of this manual.

ELECTRICAL  
INSPECTION



**CHANGING THE  
BACK-PANEL FUSE****SYSTEM OPERATION**

Power for the eight convenience outlets on the back panel is supplied only by the rear-panel power receptacle. The fuse on the rear panel protects these outlets. The rear-panel fuse holder must be fitted with a 6 amp fuse (-hp- Part No. 2110-0056).

**WARNING**

**BEFORE CHANGING THE FUSE, ENSURE THAT  
THE REAR PANEL IS DISCONNECTED FROM  
THE AC POWER SOURCE.**

To change the fuse, press on the fuse-holder and, at the same time, twist it in the direction of the arrow on the fuse-holder; withdraw the fuse and holder from the socket. Remove the fuse from the holder and substitute the replacement 6 amp fuse. To re-install the fuse, reverse the removal procedure.

**CHANGING THE  
FRONT-PANEL LAMP****WARNING**

**BEFORE CHANGING THE LINE LAMP, BE SURE  
THE I/O EXPANDER IS DISCONNECTED FROM  
THE AC POWER SOURCE.**

The LINE switch on the front panel of the I/O Expander contains a neon light bulb. If the instrument functions normally, but the LINE switch fails to light, the bulb is probably burned out. To change the bulb, switch the instrument OFF and pull the switch lens straight out; the bulb will come out with the lens. Remove the old bulb and place the new one, -hp- Part No. 2140-0244, into the lens. Now reinstall the lens.