

System 35 Desktop Computer

System Exerciser



System Exerciser



HP 9835A Desktop Computer



Hewlett-Packard Desktop Computer Division
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Printing History

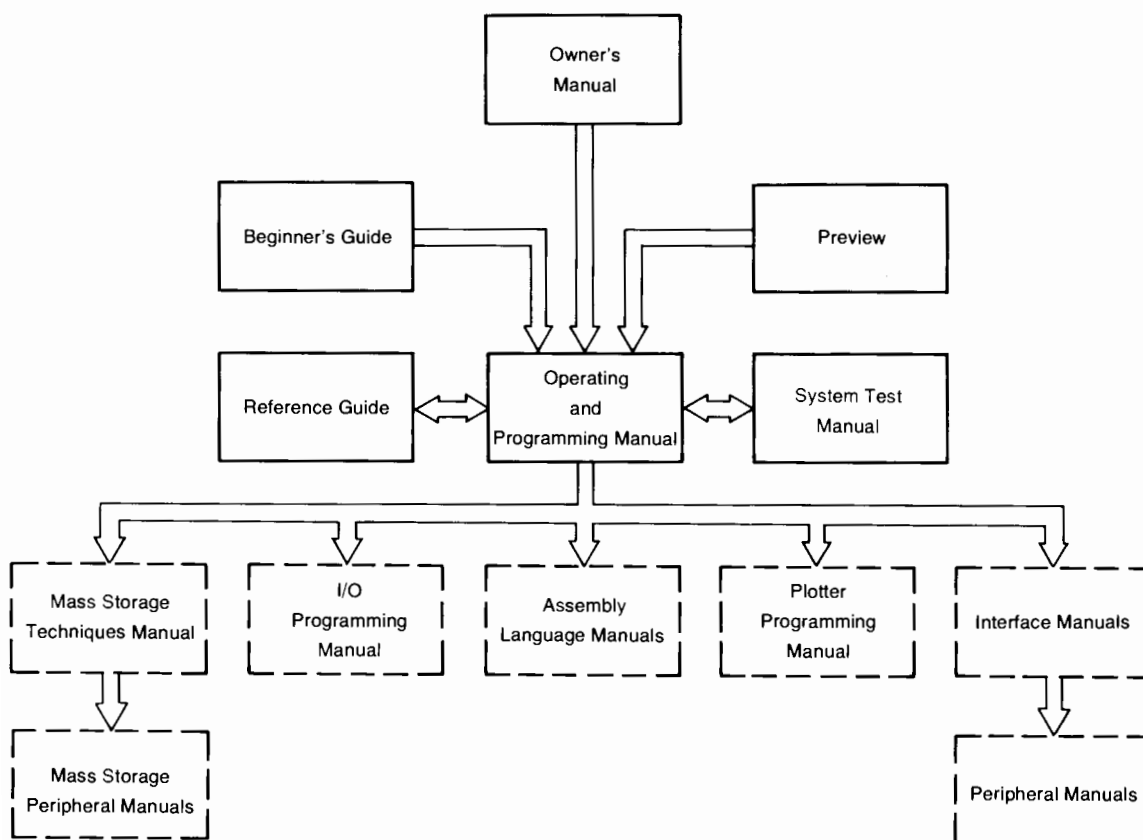
Each new edition of this manual incorporates all material updated since the previous edition. Each new revised page is indicated by a revision (rev) date. Manual change sheets are issued between editions, allowing you to correct or insert information in the current edition.

The date on the back cover changes only when each new edition is published. Minor corrections or additions may be made as the manual is reprinted between editions.

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System 35 Manual Reference

The following block diagram shows manuals that are included in the System 35 Documentation scheme and suggested progression. Dotted-line borders indicate those manuals are available with specific options; solid borders indicate those manuals that are shipped with every System 35.



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Chapter 1

General Information

Introduction

This manual contains instructions on how to use the 9835A/B System Exerciser Cartridge (P/N 09835-90041). This cartridge will check the computer's internal systems and most of its peripherals. Before checks are performed on any peripheral device, the computer itself should be thoroughly checked. Instruction prompts will appear on the CRT screen of a 9835A and on the display of a 9835B. Exerciser results, if any, will appear on a selected output device (CRT screen, internal or external printer).


NOTE

As the System Exerciser tape cartridge is subject to wear, it is suggested that you use the Exerciser program only during initial check-out of the computer or when electrical or mechanical failure is suspected.




Manual Syntax and Conventions


Dot Matrix – All items in dot matrix must be entered as shown.

[] – Items within brackets are optional.




The symbol  is used to indicate that the SHIFT key must be held down while the next key(s) is pressed.

Example:

 = a
  = A

The symbol  is used to indicate that the CONTROL key must be held down while the next key(s) is pressed.

Example:

 = stop
  = reset

Chapter 2

System Exerciser Implementation

Introduction

This chapter contains instructions on implementing the HP System 35 Exerciser program. A description of the initial start up procedure is given first, followed by an explanation of its format.

Initial Procedure

1. With power to the computer and the peripheral devices OFF, install all option ROMs and interfaces necessary for peripheral exercisers.

NOTE

Do not attempt to install or remove ROMs or interfaces when the power is on.

2. Turn the computer and the peripherals ON.
3. After a short memory test, the following display should be seen:

```
9835 READY FOR USE
```

If the proper display does not appear on your computer, contact the nearest HP Sales and Service Office for assistance. (Offices are listed in the back of this manual).

4. Insert the System Exerciser Cartridge so that the label faces the back of the computer.
5. Load the System Exerciser program by executing the following:

```
SCRATCH A   
LOAD "AUTOST", 1 
```

6. At this time, the following message will be displayed:

```
Do you want PRINTED output? (Y/N)
```

Informational messages generated by an exerciser and errors detected are usually displayed on your computer's particular display. However, this step allows you to have them printed on a specified printing device. If you do not want printed messages, enter N or NO and press . If you desire informational messages and errors to be printed, enter Y or YES and press . The computer will then ask for the select code of the printing device you wish to use. Enter the select code and press . The printed message status will remain as you set it for all successive exercisers. To change it, execute:

```
   
SCRATCH A   
LOAD "AUTOST", 1 
```

This will restart the System Exerciser program. Make the desired change when the appropriate display appears.

7. When the System Exerciser program (AUTOST) has been loaded, the following message should be displayed:

```
Enter Model # and select code...
```

To call up an exerciser, enter the device to be checked, the select code and device address (if necessary), and the optional parameters (if desired), then press .

8. The next display will be:

```
Enter # of times to run...
```

Simply enter the number of times that you want the exerciser to be repeated and press (The maximum allowable number of programmed repetitions is 25). At this time, the specified exerciser will begin.

9. At the end of all exerciser runs, the following display will be seen:

```
_ message(s). # run(s) = _ Press CONT
```

This tells you how many informational messages were generated by the exerciser (messages) and how many times the exerciser was performed (# runs). If you wish to continue the System Exerciser program, press . This will start the program over again at the exerciser call up prompt (Step 7 above). If you are through checking, remove the Exerciser Cartridge and press .

Exerciser Call Up Format

Step 7 of the initial procedure calls up the desired exerciser(s) with the prompt:

```
Enter Model # and select code...
```

The following format is used with internal computer exercisers to enter the necessary information:

```
DEVICE [ , Parameter 1 [ , Parameter 2 [ , Parameter 3]]]
```

Note: Disregard the select code prompt when entering internal systems exercisers. The select code is used only with peripheral exercisers and is explained in Chapter 4.

Each entry of this format is explained in the following text.

DEVICE Entry

The `DEVICE` entry indicates the particular internal system or peripheral device to be checked

by an exerciser. The following computer internal system exercisers are available on the Exerciser Cartridge:

1. PROC - internal processor
2. DISP - CRT or single line display
3. ROM - read only memory
4. RWM - read/write memory
5. T15 - tape drive
6. KYBD - keyboard
7. PRINTR - internal printer
8. CALC - all internal systems (includes all of the above)

Note: The `CALC` exerciser will automatically check all of the internal computer systems. For convenience, you may check only selected systems by entering the desired system in the `DEVICE` entry.

For example, entering

```
DISP
```

will call up an exerciser to check only the CRT or single line display, but

```
CALC
```

will call up an exerciser to check all internal systems including the display.

The Exerciser Cartridge also contains exercisers for the following peripheral devices:

- 9866A/B - Thermal Printer
- 9871A - Impact Printer
- 9874A - Digitizer
- 9883A - Paper Tape Photo Reader
- 9884A - Paper Tape Punch
- 98032A - 16 Bit Interface
- 98033A - BCD Interface
- 98034A - HP-IB Interface
- 98035A - Real Time Clock Interface
- 98036A - Serial Data Interface
- 98040A - Incremental Plotter Interface

The proper call up entry format for peripheral exercisers will be explained in Chapter 4.

Parameters Entry

The Parameters entry modifies the exerciser being performed. The parameters listed below are optional and are used only with internal computer system exercisers. The internal systems optional parameters are:

Parameter 1	L - long (perform detailed checks)
	M - medium (perform intermediate checks)
	S - short (perform basic checks only)
Parameter 2	I - interactive (user participation required)
	C - continuous (user participation not desired)
Parameter 3	P - output informational messages and errors (Print All)
	E - output errors only

Both internal system and peripheral device exercisers may include parameters. The above parameters apply to internal system exercisers only.

You need not enter all three optional parameters. However, those included must be entered in the order specified by the call up entry format.

The first optional parameter (L, M, or S) specifies the amount of detail an exerciser will involve. For example, entering

```
ROM, S
```

will call up an exerciser to check each ROM quickly, whereas

```
ROM, L
```

will call up an exerciser to check each ROM more thoroughly.

The second optional parameter (C or I) specifies whether you wish to participate in an exerciser. For example, if you wanted to check all of the internal systems but did not want to press the keys during the keyboard exerciser, you could enter

```
CALC, L, C
```


where C specifies no user participation desired. The C(continuous) parameter would cause the System Exerciser program to skip any exercisers that require your participation, including the keyboard exerciser. The I (interactive) parameter need not be specified as it is always assumed, that is, your participation will be assumed unless you specify otherwise.

The third optional parameter (P or E) specifies the information that you want output on your specified printer. For example, entering

```
ROM, L, C, E
```

would print only the errors detected by the exerciser, whereas

```
ROM, L, C, P
```

would output both informational messages and the errors encountered.

If only one or two optional parameters are entered, they must appear in their proper position within the parameters field, and they must be separated by the proper number of commas. For example, entering

```
ROM, , , E
```

would call an exerciser to check the ROMs and would output only the errors detected. Notice that commas are included to mark the positions of the unspecified parameters. Likewise, entering

```
RWM, L, , P
```

would call up an exerciser to perform a detailed check of the read/write memory and would output informational messages and the errors encountered. Again, note the commas which mark the position of the unspecified parameter. The number of spaces between parameters and commas will not affect the exerciser call up.



10 System Exerciser Implementation

The following table lists the internal computer exercisers and their available parameters:

Table 1

Exerciser	Available Parameters
PROC	
DISP	
ROM	L,M,S,E,P
RWM	L,M,S,E,P
T15	
KYBD	C,I
PRNTR	
CALC	L,M,S,C,I,P,E

The System Exerciser program will assume the following internal systems optional parameters if you do not specify any:

S - perform basic checks only

I - user participation required

P - output informational messages and errors encountered (Print All)

Remember, these optional parameters are used with internal computer system exercisers only. As such, the call up entry requires NO select code or device address.

The System Exerciser program allows you to call up single or multiple exercisers. For example, entering

```
ROM, L, ,P
```

would call up an exerciser to check only the ROMs, whereas

```
ROM, L, ,P/DISP
```

would call up exercisers to check both the ROMs and the display. The number of call up entries is limited only by the length of one line, that is, the call up entry line can be no longer than 160 characters. Simply separate individual DEVICE entries with a slash (/).

Chapter 3

Internal System Exercisers

Introduction

This chapter contains procedures to implement internal computer system exercisers. Included are exercisers for the following:

internal processor	tape drive
CRT or single line display	keyboard
read-only memory	internal printer
read/write memory	

If errors are indicated or results are not as described, repeat the exercisers in question. To do this, press **CONT** after the exerciser is completed. This will restart the System Exerciser program at the exerciser call up entry. If errors are still indicated after repeating an exerciser, contact the nearest HP Sales and Service Office for assistance. Office locations are listed in the back of this manual.

Internal Processor Exerciser

1. Insert the System Exerciser Cartridge into the computer. Load the System Exerciser program by executing the following:

```
SCRATCH A   
LOAD "AUTOST", 1 
```

2. After loading the program, the following prompt will be displayed:

```
Do you want PRINTED output? (Y/N)
```

Enter Y or N for your preference and press .

3. At this time, the following exerciser call up prompt will be displayed:

```
Enter Model # and select code...
```

To implement the internal processor exerciser, enter PROC. (Note: Optional parameters are not available in this exerciser). Press .

4. The following prompt will then be displayed:

```
Enter # of times to run...
```

Enter the number of times you want the exerciser performed and press . At this time the exerciser begins.

5. This exerciser will verify the proper operation of the EMC section of the internal processor. The following display will be seen during the exerciser:

```
Processor EMC Exerciser
```

Any errors detected will be displayed in an error message. If errors are indicated, carefully repeat the exerciser procedure. If errors are still indicated, contact the nearest HP Sales and Service Office for assistance.

6. When the internal processor exerciser is completed, the following display will be seen:

```
_ message(s). # run(s) = _ Press CONT
```

indicating the number of informational messages generated and the number of exerciser repetitions. To continue the System Exerciser program, press .

CRT or Single Line Display Exerciser

1. Insert the System Exerciser Cartridge into the computer. Load the System Exerciser program by executing the following:

```
SCRATCH A 
LOAD "AUTOST", 1 
```

2. After loading the program, the following prompt will be displayed:

```
Do you want PRINTED output? (Y/N)
```

Enter Y or N for your preference and press .

3. At this time, the following exerciser call up prompt will be displayed:

```
Enter Model # and select code...
```

To implement the CRT or single line display exerciser, enter DISP. (Note: Optional parameters are not available in this exerciser). Press .

4. The following prompt will then be displayed:

```
Enter # of times to run...
```

Enter the number of times you want the exerciser performed and press . At this time the exerciser begins.

If your computer is a 9835B, it will display four lines of 32 characters each representing the single line display character set (See example below). Each line will remain on the display long enough (10 seconds) for you to see any obvious errors.

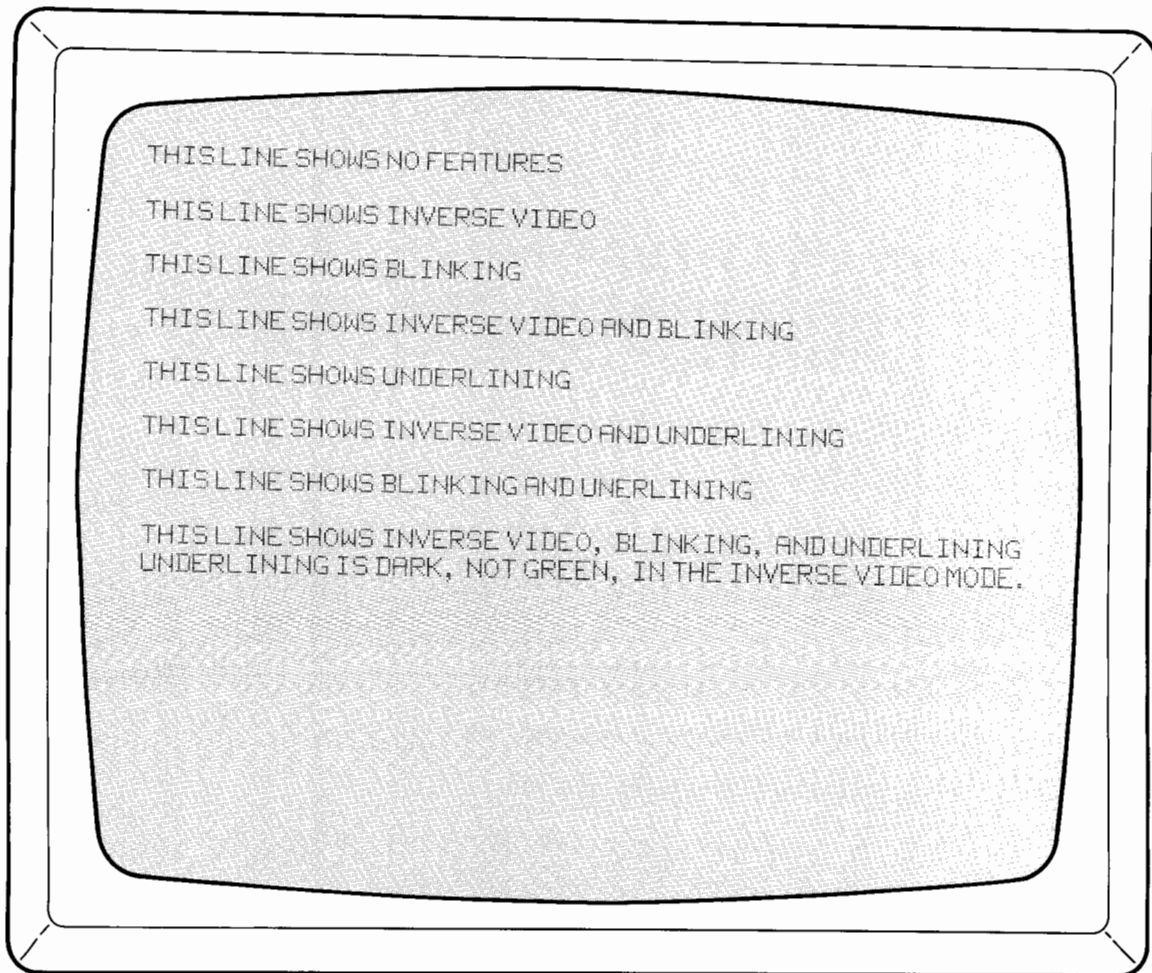
```
!@#%&'()*+,-./0123456789:;<=>?
```

```
!"#%&'()*+,-./0123456789:;<=>?
```

```
@ABCDEFGHIJKLMNPQRSTUVWXYZ[\]^_
```

```
`abcdefghijklmnopqrstuvwxyz{|}~+`
```

On the 9835A, the display exerciser consists of three parts. The first part of the exerciser will display CRT screen features as shown in the example display below.



The second part of the exerciser will display the CRT display character set.

The third part will display selective addressing and advancing numbers from 1 to 500.

5. Each portion of the exerciser will remain on the display long enough for you to notice any obvious errors. If errors are indicated, repeat the display exerciser procedure. If errors are still indicated, contact the nearest HP Sales and Service Office for assistance.
6. When the display exerciser is completed, the following will be displayed:

```
_ message(s), # run(s) = _ Press CONT
```

indicating the number of informational messages generated and exerciser repetitions. To continue the System Exerciser program, press .

ROM Exerciser

1. Insert the System Exerciser Cartridge into the computer. Load the System Exerciser program by executing the following:

```
SCRATCH R EXEC
LOAD "AUTOST", 1 EXEC
```

2. After loading the program, the following prompt will be displayed:

```
Do you want PRINTED output? (Y/N)
```

Enter Y or N for your preference and press **CONT**.

3. At this time, the following exerciser call up prompt will be displayed:

```
Enter Model # and select code...
```

To implement the read-only memory exerciser, enter ROM followed by any optional parameters and their necessary punctuation. Press **CONT**.

4. The following prompt will then be displayed:

```
Enter # of times to run...
```

Enter the number of times you want the exerciser performed and press **CONT**. At this time the exerciser begins.

Note: If the P (Print All) parameter is included in the call up entry, a ROM IN message will be displayed indicating which ROMs have been installed in the computer. Example:

```
ROM MASS STORAGE ROM IN
```

As the exerciser progresses, it will display the ROM addresses it is checking. A sample display is:

```
ROM VERIFICATION (17:50K)
```

- Errors detected by the exerciser will be displayed in an error message. If this happens, repeat the ROM exerciser procedure. If errors are still indicated, contact the nearest HP Sales and Service Office for assistance.

Note: The ROM exerciser will also check optional ROMs that plug into the front of the computer. If an optional ROM is malfunctioning, it may appear to be missing to the System Exerciser program and will not be included in a ROM IN message.

- When the ROM exerciser is completed, the following will be displayed:

```
_ message(s). # run(s) = _ Press CONT
```

indicating the number of informational messages generated and exerciser repetitions. To continue the System Exerciser program, press .

Read/Write Memory Exerciser

- Insert the System Exerciser Cartridge into the computer. Load the System Exerciser program by executing the following:

```
SCRATCH A   
LOAD "AUTOST", 1 
```

- After loading the program, the following prompt will be displayed:

```
Do you want PRINTED output? (Y/N)
```

Enter Y or N for your preference and press .

- At this time, the following exerciser call up prompt will be displayed:

```
Enter Model # and select code...
```

To implement the read/write memory exerciser, enter RWM followed by any optional parameters and their necessary punctuation. Press .

4. The following prompt will then be displayed:

```
Enter # of times to run...
```

Enter the number of times you want the exerciser performed and press . At this time the exerciser begins.

5. This exerciser will check the operation of the read/write memory. The following is a typical RWM exerciser display:

```
Quick R/W Check 4B
```

The 9835A screen will flash approximately every 20 seconds and the computer will beep to indicate that the exerciser is still in progress. If you wish to halt the exerciser, press and wait until the display lights up. Executing will terminate the exerciser. If this exerciser does not complete normally or if errors are displayed, carefully repeat the procedure. If errors are still indicated, contact the nearest HP Sales and Service Office for assistance.

6. When the read/write memory exerciser is completed, the following will be displayed:

```
_ message(s). # run(s) = _ Press CONT
```

indicating the number of informational messages generated and exerciser repetitions. To continue the System Exerciser program, press .

Tape Drive Exerciser

Insure that the tape head is clean before performing this exerciser.

1. Insert the System Exerciser Cartridge into the computer. Load the System Exerciser program by executing the following:

```
SCRATCH A 
LOAD "AUTOST", 1 
```

2. After loading the program, the following prompt will be displayed:

```
Do you want PRINTED output? (Y/N)
```

Enter Y or N for your preference and press .

3. At this time, the following exerciser call up prompt will be displayed:

```
Enter Model # and select code...
```

To implement the tape drive exerciser, enter T15. (Note: Optional parameters are not available in this exerciser). Press .

4. The following prompt will then be displayed:

```
Enter # of times to run...
```

Enter the number of times you want the exerciser performed and press . At this time the exerciser begins.

5. You will hear the tape being advanced as this exerciser is in progress. The exerciser will check the tape drive and the tape heads by creating, filling, reading, and writing data files. Errors detected will be displayed in an error message. If this happens, repeat the T15 exerciser procedure. If errors are still indicated, contact the nearest HP Sales and Service Office for assistance.
6. When the tape drive exerciser is completed, the following will be displayed:

```
_ message(s). # run(s) = _ Press CONT
```

indicating the number of informational messages generated and exerciser repetitions. To continue the System Exerciser program, press .

Keyboard Exerciser

1. Insert the System Exerciser Cartridge into the computer. Load the System Exerciser program by executing the following:

```
SCRATCH A EXEC
LOAD "AUTOST", 1 EXEC
```



2. After loading the program, the following prompt will be displayed:

Do you want PRINTED output? (Y/N)

Enter Y or N for your preference and press CONT.

3. At this time, the following exerciser call up prompt will be displayed:

Enter Model # and select code...

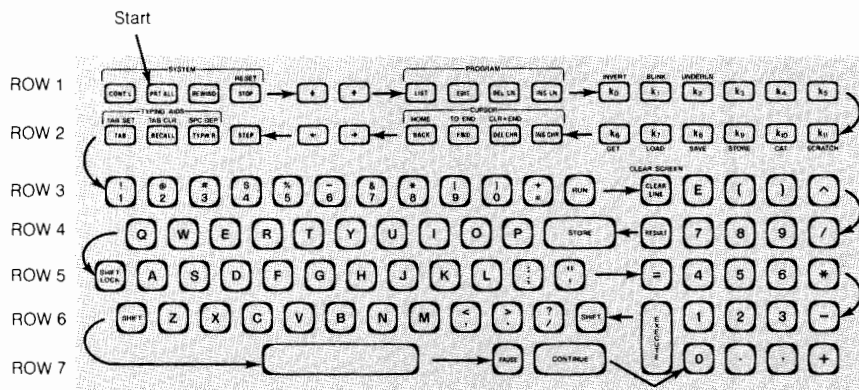
To implement the keyboard exerciser, enter KYBD. Press CONT.

4. The following prompt will then be displayed:

Enter # of times to run...


Enter the number of times you want the exerciser performed and press CONT. At this time the exerciser begins.

Your participation in this exerciser will be assumed. A series of prompts on the display will instruct you to depress the keys in a particular order. The exerciser starts at the upper left corner of the keyboard and ends in the lower right. The following diagram indicates the order in which the keys are depressed.






For example, the first prompt you see will be:

PRESS PRT ALL



directing you to depress the  (Print All) key. You will be instructed to continue depressing the keys until the end of the exerciser. The last key prompt you will see will be



PRESS ±


directing you to depress the  (plus sign) key. An underlined key symbol indicates that the key is located in the right (numeric) key pad.

If the  key or the  key needs to be held down while depressing successive keys, the prompt will direct you to do so.

Examples:

PRESS CONTROL K11 - depress  while pressing 

PRESS SHIFT 4 - depress  while pressing 

Also, use of the  key is implied by the case of the prompted character (i.e. upper case or lower case). If you follow the keyboard diagram, the SHIFT LOCK key will provide the proper shifting function.

Examples of Error Messages:

K11 REPEATED - key "bounced" or was depressed more than once

K11 FAILED - key switch malfunctioned after being depressed five times

5. Only one of each type of error message is displayed and it reflects the most recent key in error. If errors are indicated, repeat the KYBD exerciser procedure. If errors are still indicated, contact the nearest HP Sales and Service Office for assistance.

6. When the keyboard exerciser is completed, the following will be displayed:

```
_ message(s). # run(s) = _ Press CONT
```

indicating the number of informational messages generated and exerciser repetitions. To continue the System Exerciser program, press .

Internal Printer Exerciser

1. Insert the System Exerciser Cartridge into the computer. Load the System Exerciser program by executing the following:

```
SCRATCH A   
LOAD "AUTOST", 1 
```

2. After loading the program, the following prompt will be displayed:

```
Do you want PRINTED output? (Y/N)
```

Enter Y or N for your preference and press .

3. At this time, the following exerciser call up prompt will be displayed:

```
Enter Model # and select code...
```

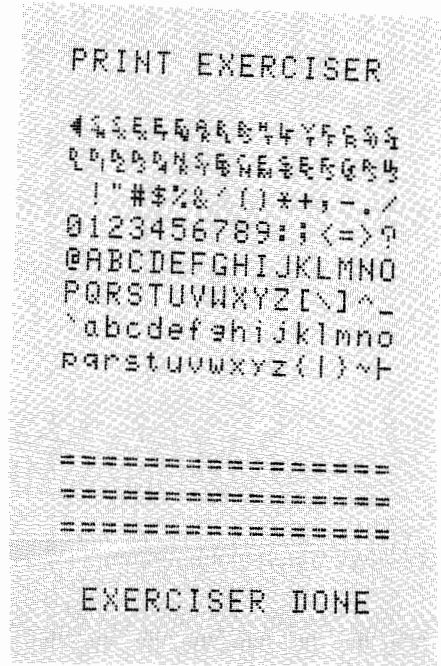
To implement the internal printer exerciser, enter PRINTR. (Note: Optional parameters are not available in this exerciser). Press .

4. The following prompt will then be displayed:

```
Enter # of times to run...
```

Enter the number of times you want the exerciser performed and press . At this time the exerciser begins.

The internal printer exerciser checks the performance of the optional internal printer on the System 35. This exerciser instructs the printer to print the following character set:



Note: If your computer contains an alternate character set, it will be printed immediately following the standard character set.

- 5. Errors detected by the exerciser will be displayed in an error message. If this happens, carefully repeat the PRINTR exerciser procedure. If errors are still indicated, contact the nearest HP Sales and Service Office for assistance.
- 6. When the internal printer exerciser is completed, the following will be displayed:

```
_ message(s). # run(s) = _ Press CONT
```

indicating the number of exerciser messages generated and exerciser repetitions. To continue the System Exerciser program, press .

Calculator Exerciser

1. Insert the System Exerciser Cartridge into the computer. Load the System Exerciser program by executing the following:

```
SCRATCH A 
LOAD "AUTOST", 1 
```

2. After loading the program, the following prompt will be displayed:

```
Do you want PRINTED output? (Y/N)
```

Enter Y or N for your preference and press .

3. At this time, the following exerciser call up prompt will be displayed:

```
Enter Model # and select code...
```

To implement the calculator exerciser, enter CALC followed by any optional parameters and their necessary punctuation. Press .

4. The following prompt will then be displayed:

```
Enter # of times to run...
```

Enter the number of times you want the exerciser performed and press . At this time the exerciser begins.

5. This exerciser will check all of the computer's internal systems as described in the previous sections. Refer to the proper exerciser description for an explanation of a particular exerciser.

Remember, use of the C (continuous) parameter will eliminate the need for your participation in all of the exercisers performed by CALC. As a result, exercisers performed will not be as comprehensive.

6. When the calculator exerciser is completed, the following will be displayed:

```
_ message(s), # run(s) = _ Press CONT
```

indicating the number of informational messages generated and exerciser repetitions. To continue the System Exerciser program, press .

Chapter 4

Peripheral Exercisers

Introduction

This chapter contains information on implementing exercisers for peripheral devices that may be connected to the System 35. The peripheral exercisers available and the ROM necessary for each exerciser are listed in Table 2.

To implement a peripheral exerciser:

1. Insure that the proper plug-in ROM is installed in the computer (refer to Table 2) and that the peripheral device is properly connected to the computer. Connection instructions for each peripheral device are included with the exerciser instructions for that particular device.

CAUTION

POWER TO THE SYSTEM 35 AND TO THE PERIPHERALS MUST BE TURNED OFF BEFORE INSERTING OR REMOVING INTERFACES OR PLUG-IN ROMS. FAILURE TO DO SO MAY RESULT IN DAMAGE TO THE INTERFACES, ROMS, OR TO THE COMPUTER.

2. Proceed to the appropriate exerciser instructions in this chapter.

Table 2

Peripheral	I/O ROM
9866A/B Thermal Printer	
9871A Impact Printer	
9874A Digitizer	X
9883A Paper Tape Reader	X
9884A Paper Tape Punch	
98032A 16-Bit Interface	X
98033A BCD Interface	X
98034A HP-IB Interface	X
98035A Real Time Clock	X
98036A Serial Data Interface	X
98040A Incremental Plotter Interface	

If errors are indicated or the results are not as described, repeat the exerciser in question. To do this, press **CONT** after the exerciser is completed. This will restart the System Exerciser program at the exerciser call up entry. If errors still exist after repeating an exerciser, contact the nearest HP Sales and Service Office for assistance. Office locations are listed in the back of this manual.

Initial Procedure

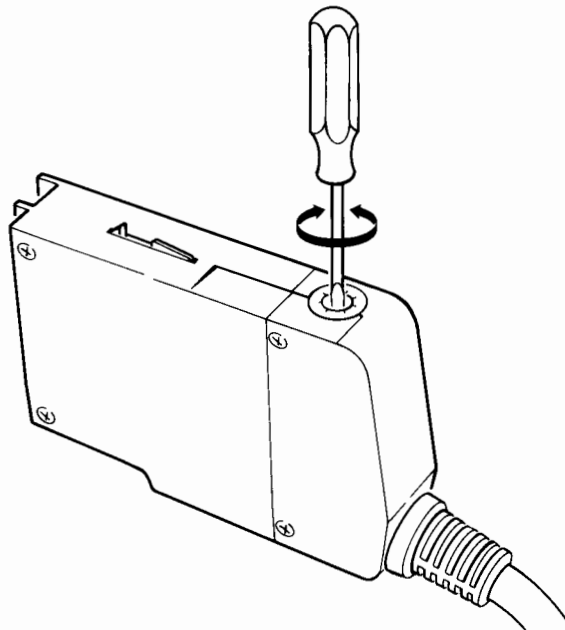
The procedure for implementing a peripheral device exerciser follows the Initial Procedure outlined in Chapter 2 except for the exerciser call up entry (Step 7). Whereas internal system exerciser call up entries do not include a select code or device address, peripheral exerciser call up entries may. The following format is used to call up a peripheral exerciser:

```
DEVICE , Select Code [Device Address [ , Parameter [ , Parameter [ , ...Parameter]]]]
```

where DEVICE specifies the peripheral, Select Code and Device Address represent the select code and device address values, and Parameters specify the optional parameters that may be available in a particular exerciser. Available optional parameters for a peripheral exerciser will be explained in the appropriate exerciser description. Call up entries of peripherals utilizing an HP-IB Interface Card must include BOTH a select code and device address. Call up entries of peripherals using all other interface cards need only include a select code value.

Select Code

The select code of all peripherals to be checked must be obtained for inclusion in the exerciser call up entry. The select code is the value to which the interface card (connecting the peripheral to the System 35) is set. The illustration below shows the select code switch of a typical interface card.



The interface card is preset to a particular select code at the factory. To change the setting, rotate the switch (shown above) using a small screwdriver.

Device Address

The device address refers to the value to which the address switches are set on a peripheral device. This value will be included in the exerciser call up entries of ONLY those peripherals utilizing an HP-IB Interface Card (98034A). If a peripheral is not HP-IB compatible, it will not have device address switches, and therefore, the device address need not be included in its exerciser call up entry.

There are several types of address switches available on HP peripheral devices. If a peripheral being exercised has address switches, refer to its Operating and Programming Manual for information on setting and reading the switches.

If a one digit device address is included, it must be preceded by a zero (0). For example, if the device address switches are set to a value of 5, this number would be entered as 05. As an example, assume an HP9874A Digitizer is being checked. If its select code switch is set to 7 and its address switches are set to 6, the proper call up entry would be:

```
9874A, 706
```

If the devices address consists of two digits, both are included in the entry. In the above example, if the address switches are set to 22, the correct entry would be:

```
9874A, 722
```

As another example, assume a 9866A Printer is being checked. As it is not HP-IB compatible, only its select code need be entered in the exerciser call up entry. If the select code switch of its interface card is set to 6, the correct call up entry would be:

```
9866A, 6
```

9866A/B Thermal Printer

1. With power OFF, make sure that the computer and printer are properly connected.
2. Turn the printer and computer ON. The white light above the LINE switch indicates that the printer is ON. If the amber light below the Paper Advance switch lights, you do not have any paper. Start the exerciser with a fresh roll.
3. With the Exerciser Cartridge inserted in your computer, execute the following:

```
SCRATCH A 
LOAD "AUTOST", 1 
```

This will load the System Exerciser program into your computer.

4. After loading the System Exerciser program, the following prompt will be displayed:

```
Do you want PRINTED output? (Y/N)
```

Enter Y or N for your preference and press . (Note: if you enter Y(es), insure that the printer being checked is NOT the same one that will print your informational messages and errors).

5. The following exerciser call up entry will then be displayed:

```
Enter Model # and select code...
```

To implement the 9866A or B Thermal Printer exerciser, enter 9866A (or 9866B) followed by the necessary select code entry. Press .

6. The following prompt will then be displayed:

```
Enter # of times to run...
```

Enter the number of times you want the exerciser performed and press . At this time the exerciser begins.

7. Compare the printout with the sample shown. If the printout differs from the sample, repeat the exerciser. Carefully compare each line of the sample with the finished printout. Note any characters which are missing or incompletely printed. If the same errors are repeated line after line in your printout, the printer may be defective. If your printer appears defective, contact the nearest HP Sales and Service Office for assistance.
8. When the 9866A (or B) exerciser is completed, the following will be displayed:

```
_ message(s). # run(s) = _ Press CONT
```

indicating the number of informational messages generated and exerciser repetitions. To continue the System Exerciser, press .

9871A Impact Printer

1. With power OFF, make sure that the computer and printer are properly connected.
2. Switch the computer and the printer ON.
3. Load the printer with a sheet of 8 1/2 x 14 paper (insert the long edge first).

NOTE

If your 9871A Printer is equipped with option 98021A Form Feed Accessory, it must be removed prior to running this exerciser. (See 9871A Printer Operating Manual, Part No. 09871-90000).

4. With the Exerciser Cartridge inserted in the computer, load the System Exerciser program by executing the following:

```
SCRATCH A   
LOAD "AUTOST", 1 
```

5. After loading the System Exerciser program, the following prompt will be displayed:

```
Do you want PRINTED output? (Y/N)
```

Enter Y or N for your preference and press . (Note: if you enter Y(es), insure that the printer being exercised is NOT the same one that will print your informational messages and errors).

6. The following exerciser call up entry will then be displayed:

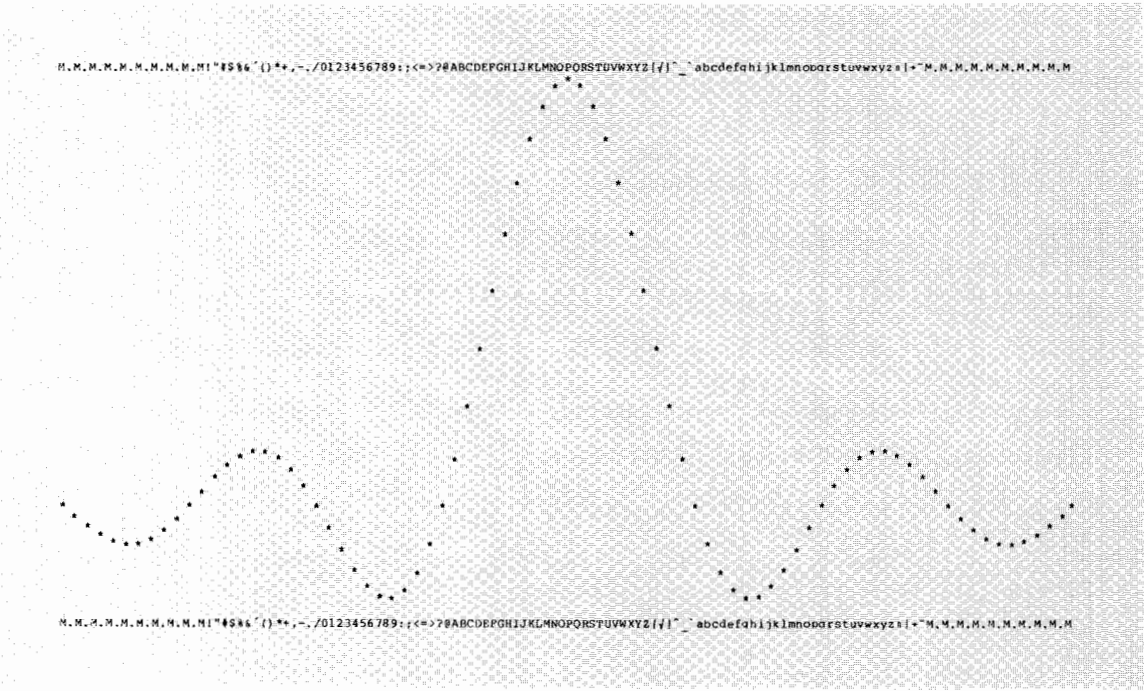
```
Enter Model # and select code...
```

To implement the 9871A Impact Printer exerciser, enter 9871A followed by the necessary select code and device address (if required) entry. Press **CONT**.

7. The following prompt will then be displayed:

```
Enter # of times to run...
```

Enter the number of times you want the exerciser performed and press **CONT**. At this time the exerciser begins. The printout should appear as shown below:



8. If the printout differs from the sample, carefully repeat the entire procedure. Should the printout still fail to duplicate the sample, contact the nearest HP Sales and Service Office for assistance.

9. When the 9871A exerciser is completed, the following will be displayed:

```
_ message(s). # run(s) = _ Press CONT
```

indicating the number of informational messages generated and exerciser repetitions. To continue the System Exerciser program, press **CONT**.

9874A Digitizer

This exerciser requires the I/O ROM.

1. With the power OFF to the computer and the digitizer, install the I/O ROM in the computer. Connect the HP-IB Interface Card to the computer and the digitizer. Note the select code and the device address. Turn the computer and the digitizer ON.
2. With the System Exerciser Cartridge inserted in the computer, load the System Exerciser program by executing the following:

```
SCRATCH A 
LOAD "AUTOST", 1 
```

3. After loading the System Exerciser program, the following prompt will be displayed:

```
Do you want PRINTED output? (Y/N)
```

Enter Y or N for your preference and press .

4. The following exerciser call up entry will then be displayed:

```
Enter Model # and select code...
```

To implement the 9874A Digitizer exerciser, enter 9874A followed by the necessary select code and device address entry. Press .

5. The following prompt will then be displayed:

```
Enter # of times to run...
```

Enter the number of times you want the exerciser performed and press . At this time the exerciser begins.

6. The first display of the exerciser will be:

```
Watch the digitizer display.
```

After two minutes of memory tests, the exerciser checks the digitizer's display by displaying its characters and character segments. Insure that all character segments light up properly.

7. The second portion of the exerciser checks the indicator lights above each key on the digitizer's keyboard. Each indicator light should light for a few seconds as the exerciser checks them sequentially from the top of the keyboard to the bottom.
8. The third portion of the exerciser checks the digitizer's key switches. Your participation is required to depress the digitizer's keys as directed by the computer's display. You will be prompted to depress a sequence of keys starting at the top of the digitizer's keyboard and ending at the bottom. For example, the first keyboard prompt you see will be:

PRESS SHIFT

directing you to press the SHIFT (tan colored) key on the digitizer. You will continue to receive prompts to depress the remaining keys in a particular sequence. The last key prompt you see will be:

PRESS CLEAR

directing you to press the CLEAR key.

If a key is malfunctioning or if you should depress the wrong key, the 9874A will beep and direct you to depress the key again. You will be prompted up to four additional times to depress the key. If you had depressed the wrong key, the exerciser will continue as soon as you depress the correct key. If, however, the key switch is malfunctioning, the exerciser will abort after the fifth depression.

When you finish depressing the keys on the digitizer's keyboard, you will be directed to depress the two remaining keys on the cursor. You will be prompted to PRESS DIG (D key or stylus down) and PRESS VAC (A key). PRESS VAC is not displayed if the optional stylus is attached.

9. The last portion of the exerciser will check the digitizing capability of the 9874A. The following display will be seen:

Place cursor/stylus on platen.

Simply remove the cursor from its holder and place it on the platen. If you are using a stylus, place it on the platen.

10. The following message will then be displayed:

Press D switch: Locate X=0, Y=0.

Press the D key on the cursor. With the A key depressed, move the cursor to the center of the platen to point 0,0 (± 10). (If a stylus is used, press it down on the platen at point 0,0). When you reach the center of the platen, an extended tone will be heard and the computer will display:

```
TEST DONE
```

The following message will then be displayed indicating that the exerciser is finished:

```
9874A TEST PASSED
```

11. If error messages are displayed by the exerciser, carefully repeat the 9874A exerciser procedure. If errors are still indicated, contact the nearest HP Sales and Service Office for assistance.
12. When the 9874A exerciser is completed, the following will be displayed:

```
_ message(s). # run(s) = _ Press CONT
```

indicating the number of informational messages generated and exerciser repetitions. To continue the System Exerciser program, press .

9883A Paper Tape Photo Reader

This exerciser requires the I/O ROM.

1. With power OFF, insert the I/O ROM into the computer.
2. Make sure that the computer and tape reader are properly connected.
3. Switch the computer and tape reader ON.
4. With the System Exerciser Cartridge inserted in your computer, load the System Exerciser program by executing the following:

```
SCRATCH A   
LOAD "AUTOST", 1 
```

5. After loading the System Exerciser program, the following prompt will be displayed:

```
Do you want PRINTED output? (Y/N)
```

Enter Y or N for your preference and press .

6. The following exerciser call up entry will then be displayed:

```
Enter Model # and select code...
```

To implement the 9883A Paper Tape Photo Reader exerciser, enter 9883A followed by the necessary select code entry. Press .

7. The following prompt will then be displayed:

```
Enter # of times to run...
```

Enter the number of times you want the 9883A exerciser performed and press . The exerciser begins when the following is displayed:

```
9883A TEST
```



8. The following prompt will then be displayed:

```
LOAD TEST TAPE; PRESS CONT
```

Load the diagnostic tape (Part No. 09883-90030) supplied with the tape reader and then press READ on the front of the tape reader. Press .

9. The 9883A exerciser is completed when the following is displayed:

```
9883A TEST PASSED
```

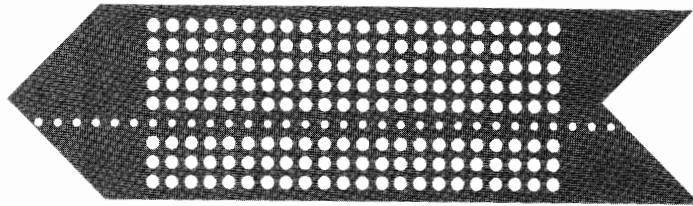
10. The tape reader should read the entire tape. If errors are displayed, carefully repeat the entire procedure. If errors are still indicated, contact the nearest HP Sales and Service Office for assistance.
11. When the 9883A exerciser is completed, the following will be displayed:

```
_ message(s), # run(s) = _ Press CONT
```

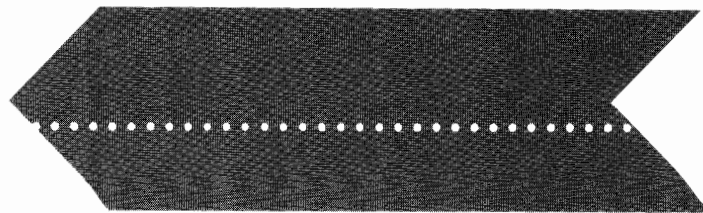
indicating the number of informational messages generated and exerciser repetitions. To continue the System Exerciser program, press .

9884A Paper Tape Punch

1. With power OFF, insure that the computer and punch are properly connected.
2. Turn the computer and punch ON.
3. Insure that the punch is loaded with paper tape.
4. Press the FEED HOLES switch on the punch. The following tape hole pattern should be punched:



5. Press the CODE HOLES switch on the punch. The following tape hole pattern should be punched:



6. With the System Exerciser Cartridge inserted in your computer, load the System Exerciser program by executing the following:

```
SCRATCH A (CONT)
LOAD "AUTOST", 1 (EXEC)
```

7. After loading the System Exerciser program, the following prompt will be displayed:

```
Do you want PRINTED output? (Y/N)
```

Enter Y or N for your preference and press (CONT).

8. The following exerciser call up entry will then be displayed:

```
Enter Model # and select code...
```

To implement the 9884A Paper Tape Punch exerciser, enter 9884A followed by the necessary select code entry. Press (CONT).

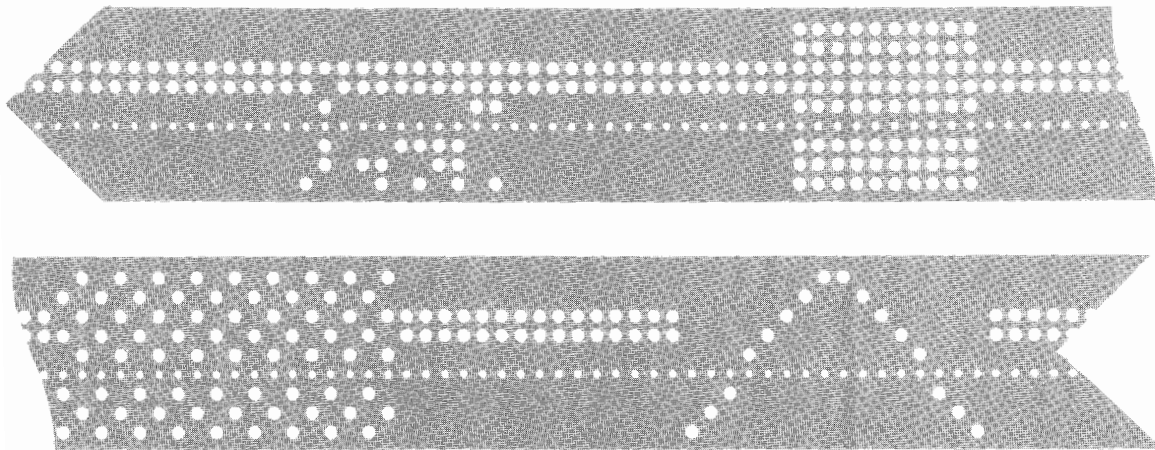
9. The following prompt will then be displayed:

```
Enter # of times to run...
```

Enter the number of times you want the 9884A exerciser performed and press . At this time the exerciser begins with the following display:

```
9884 TEST
```

The resulting punched tape should be the same as the example shown below:



10. If the punched tape is the same, the punch is operating properly. If there are missing holes or if there are extra punched holes, contact the nearest HP Sales and Service Office for assistance.
11. When the 9884A exerciser is completed, the following will be displayed:

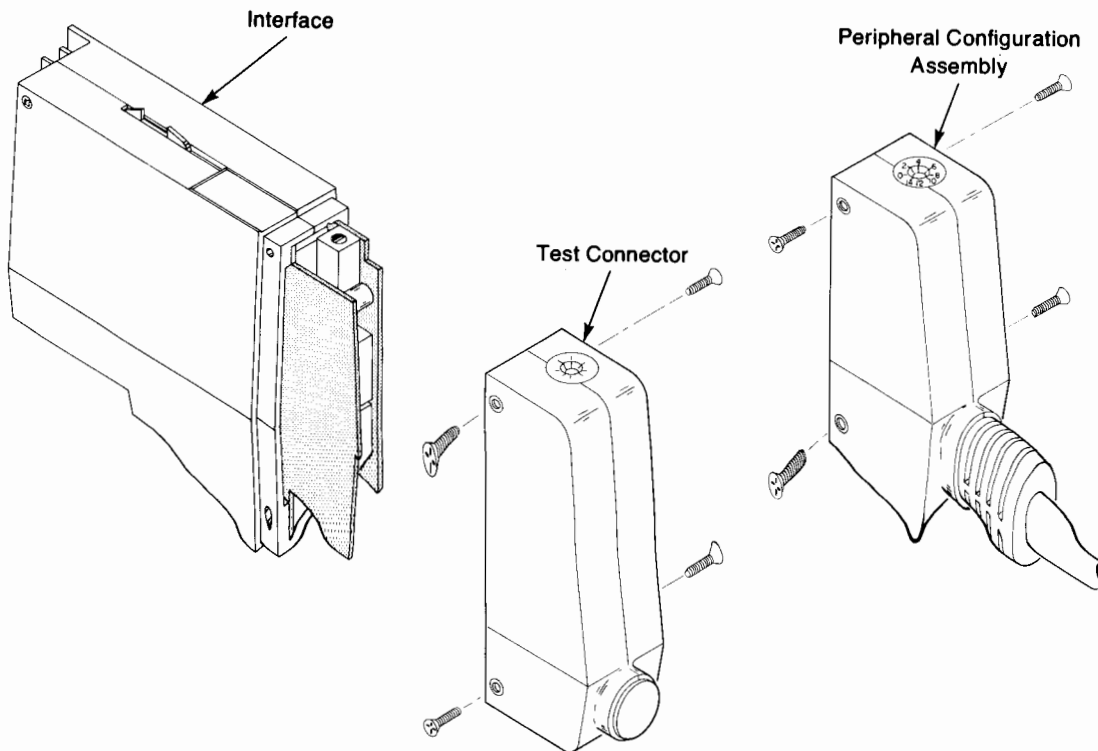
```
_ message(s). # run(s) = _ Press CONT
```

indicating the number of informational messages generated and exerciser repetitions. To continue the System Exerciser program, press .

98032A 16-Bit Interface

This exerciser requires the I/O ROM and a 98241-67932 Test Connector.

1. Remove the Peripheral Configuration Assembly and install the Test Connector (Part No. 98241-67932).



2. With the computer OFF, install the I/O ROM.
3. Plug the interface into the back of the computer and turn the computer ON.
4. With the System Exerciser Cartridge inserted in your computer, load the System Exerciser program by executing the following:

```
SCRATCH A 
LOAD "AUTOST", 1 
```

5. After loading the System Exerciser program, the following prompt will be displayed:

```
Do you want PRINTED output? (Y/N)
```

Enter Y or N for your preference and press .

6. The following exerciser call up entry will then be displayed:

```
Enter Model # and select code...
```

To implement the 98032A 16-Bit Interface exerciser, enter 98032A followed by the necessary select code entry. Press **CONT**.

7. The following prompt will then be displayed:

```
Enter # of times to run...
```

Enter the number of times you want the 98032A exerciser performed and press **CONT**. At this time the exerciser begins.

The following displays should be seen while the exerciser is in progress:

```
Doing 98032 DATA PATTERNS TEST
```

```
Doing I/O line TEST
```

```
Doing EXTENDED CTRL and STATUS
```

```
Test COMPLETE
```

During the exerciser the computer will beep periodically to indicate that the exerciser is still in progress. Errors detected by the exerciser will be displayed during the exerciser.

8. If errors are indicated, carefully repeat the procedure. If errors are still indicated, contact the nearest HP Sales and Service Office for assistance.
9. When the exerciser has been satisfactorily completed, remove the Test Connector and reassemble the 98032A Interface.
10. When the 98032A exerciser is completed, the following will be displayed:

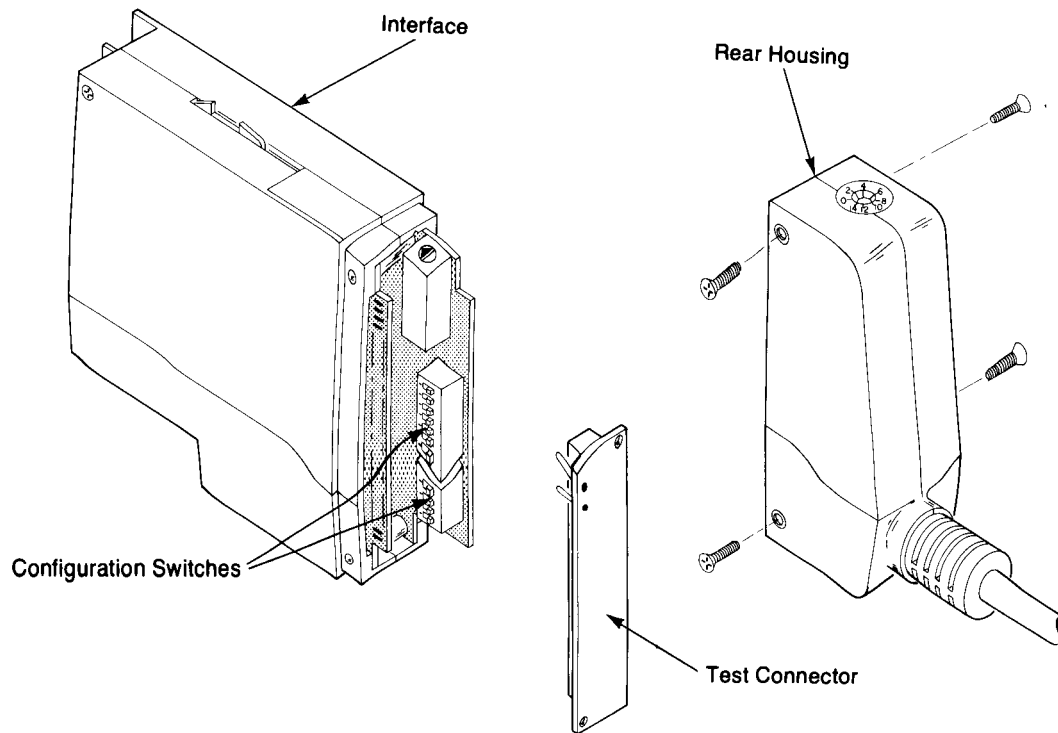
```
_ message(s). # run(s) = _ Press CONT
```

indicating the number of informational messages generated and exerciser repetitions. To continue the System Exerciser program, press **CONT**.

98033A BCD Interface

This exerciser requires the I/O ROM and a 98241-67933 Test Connector.

1. Remove the rear housing of the interface and install the Test Connector (Part No. 98241-67933) and set all of the configuration switches to OFF (refer to the 98033A BCD Interface Installation and Service Manual, Part No. 98033-90000).



2. Turn the computer OFF.
3. Install the I/O ROM in the front of the computer and the interface in the back of the computer. Turn the computer ON.
4. With the System Exerciser Cartridge inserted in the computer, load the System Exerciser program by executing the following:

```
SCRATCH A 
LOAD "AUTOST", 1 
```

5. After loading the System Exerciser program, the following prompt will be displayed:

```
Do you want PRINTED output? (Y/N)
```

Enter Y or N for your preference and press .

6. The following exerciser call up entry will then be displayed:

```
Enter Model # and select code...
```

To implement the 98033A BCD Interface exerciser, enter 98033A followed by the necessary select code entry. Press **CONT**.

7. The following prompt will then be displayed:

```
Enter # of times to run...
```

Enter the number of times you want the exerciser performed and press **CONT**. At this time the exerciser begins.

The following display should be seen while the exerciser is in progress:

```
98033A BCD Interface Test
```

The computer will beep periodically to indicate that the exerciser is still in progress.

8. Errors detected will be displayed in an error message. If this happens, verify the proper setting of the configuration switches and carefully repeat the exerciser procedure. If errors are still indicated, contact the nearest HP Sales and Service Office for assistance.
9. When the exerciser has been satisfactorily completed, remove the Test Connector, reset the configuration switches to their previous state, and reassemble the 98033A Interface.
10. When the 98033A exerciser is completed, the following will be displayed:

```
_ message(s). # run(s) = _ Press CONT
```

indicating the number of informational messages generated and exerciser repetitions. To continue the System Exerciser program, press **CONT**.

98034A Interface

This exerciser requires the I/O ROM. It also requires two 98034A interfaces: one to be exercised and one to perform the exerciser.

The interface being exercised should be set to the factory configuration (refer to the 98034A Installation and Service Manual, Part No. 98034-90000). The interface performing the exerciser must be disassembled and reconfigured as shown on the next page.

1. Insure that computer power is OFF.
2. Install the I/O ROM.
3. Following the procedure in the Installation and Service Manual, remove the interface cover on the interface performing the exerciser. Separate case halves as shown in the illustration on the next page. On the 98034-66502 board, change the parallel poll bit from 1 to 2. Note the switch positions before you change them. On the 98034-66501 board, change the talk/listen address switches to ON,ON,OFF,ON,OFF. Set the system controller switch to OFF. Keep the parallel poll logic switch at the 1 position. Change the select code to 6.
4. Reassemble the exerciser interface. Plug both interfaces into the back of the computer. Plug HP-IB connectors together and turn computer power ON.
5. With the System Exerciser Cartridge installed in the computer, load the System Exerciser program by executing the following:

```
SCRATCH A 
LOAD "AUTOST", 1 
```

6. After loading the System Exerciser program, the following prompt will be displayed:

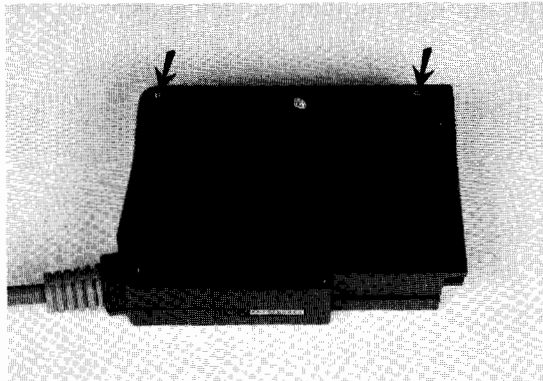
```
Do you want PRINTED output? (Y/N)
```

Enter Y or N for your preference and press .

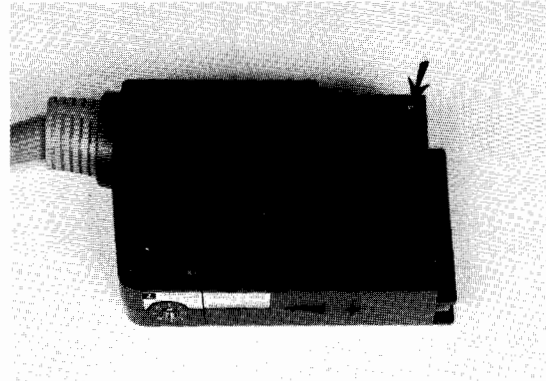
7. The following exerciser call up entry will then be displayed:

```
Enter Model # and select code...
```

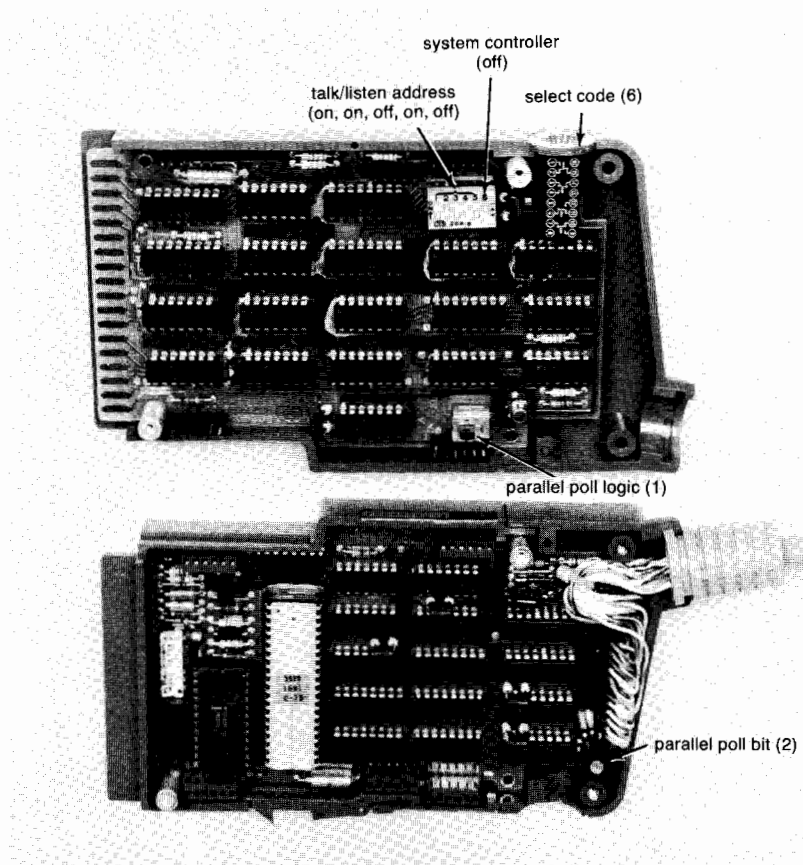
To implement the 98034A Interface exerciser, enter 98034A followed by the select code entry of the interface being exercised. (Note: Insure that the select code of the interface being exercised is not set to 6).



A. Remove only the four screws as shown above.



B. Flip the card over and remove these two screws.



C. Separate the case halves and position them as shown.

8. The following prompt will then be displayed:

```
Enter # of times to run...
```

Enter the number of times you want the 98034A exerciser performed and press **CONT**. At this time the exerciser begins. The computer will display which portion of the exerciser is in progress. When finished, the following will be displayed:

```
TEST COMPLETE
```

9. Errors detected by the 98034A exerciser will be displayed in an error message. If this happens, verify the proper setting of the interface switches and all connections and repeat the exerciser carefully. If errors are still indicated, contact the nearest HP Sales and Service Office for assistance.
10. When the exerciser has been satisfactorily completed, return the interface performing the exerciser to its factory or user specifications (refer to 98034A Installation and Service Manual, Part No. 98034-90000). Reassemble the interface.
11. When the 98034A exerciser is completed, the following display will be seen:

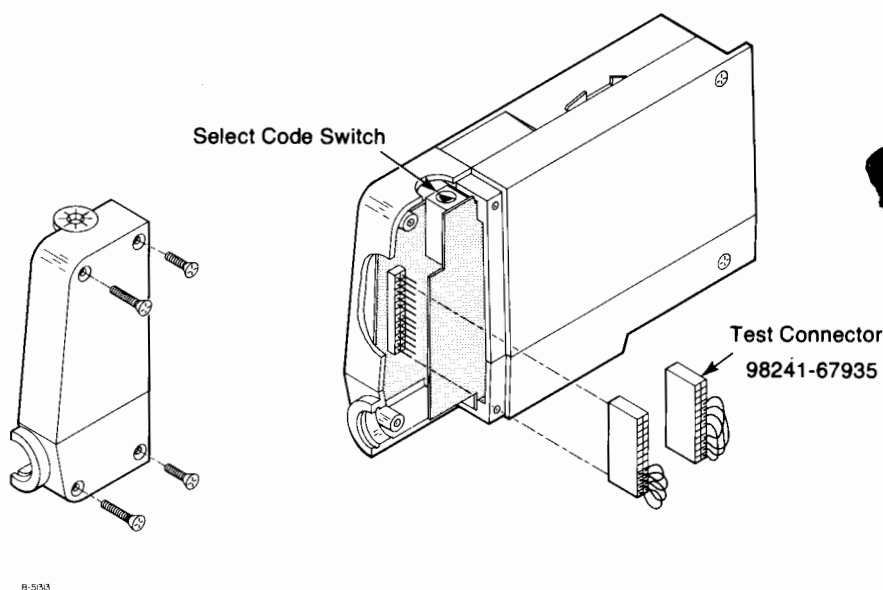
```
_ message(s). # run(s) = _ Press CONT
```

indicating informational messages generated and exerciser repetitions. To continue the System Exerciser program, press **CONT**.

98035A Real Time Clock

This exerciser will require the I/O ROM and a 98241-67935 Test Connector.

1. Turn computer power OFF.
2. Install the I/O ROM and remove the Real Time Clock unit. Remove the 4 screws from the rear housing and remove the rear housing (see illustration below).
3. Remove the wired connector from the back of the Real Time Clock unit and install the Test Connector in place of the wired connector (see illustration below).



Note: If your 98035A has the option cable, carefully remove the connector and install the Test Connector. This exerciser will automatically run on either option 001 or 002 (U.S. or European date format).

4. Plug the Real Time Clock into the back of the computer and turn the computer ON.
5. With the System Exerciser Cartridge installed in the computer, load the System Exerciser program by executing the following:

```
SCRATCH A (CMX)
LOAD "AUTOST", 1 (CMX)
```

6. After loading the System Exerciser program, the following prompt will be displayed:

```
Do you want PRINTED output? (Y/N)
```

Enter Y or N for your preference and press .

7. The following exerciser call up entry will then be displayed:

```
Enter Model # and select code...
```

To implement the Real Time Clock exerciser, enter 98035A followed by the necessary select code entry. Press .

8. The following prompt will then be displayed:

```
Enter # of times to run...
```

Enter the number of times you want the exerciser performed and press . At this time the exerciser begins.

One exerciser pass requires approximately three minutes to complete. The time setting of the Clock will be changed during the exerciser. This will have to be reset after the exerciser is completed.

9. The computer will display each portion of the exerciser as it progresses. Any errors detected by the exerciser will be displayed in an error message. If errors are detected, carefully repeat the exerciser procedure. If errors are still indicated, contact the nearest HP Sales and Service Office for assistance.
10. When the exerciser has been satisfactorily completed, remove the Test Connector, reinstall the wired connector, and reassemble the Real Time Clock unit.
11. When the 98035A exerciser is completed, the following will be displayed:

```
_message(s). # run(s) = _Press CONT
```

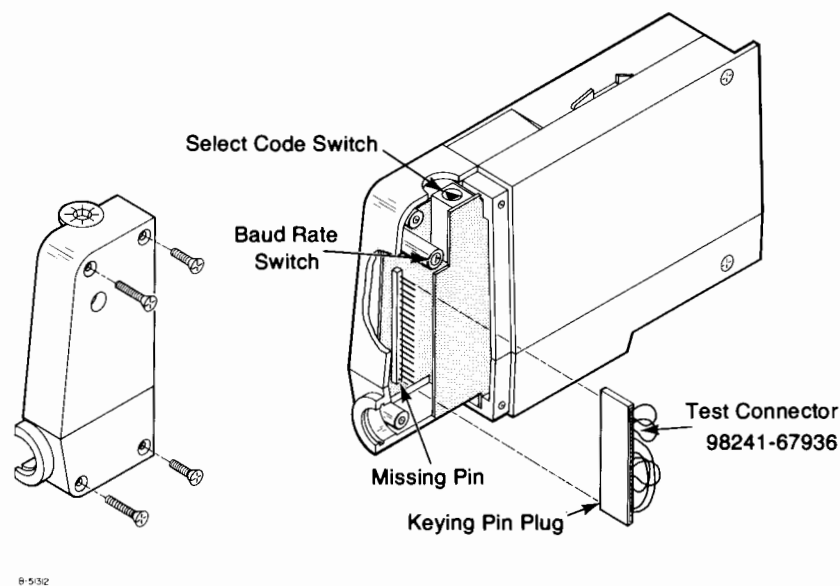
indicating the number of informational messages generated and exerciser repetitions. To continue the System Exerciser program, press .

98036A Serial Interface

This exerciser requires the I/O ROM and a 98241-67936 Test Connector.

1. Insure that computer power is turned OFF.
2. Install the I/O ROM and remove the Serial Interface unit. Remove four screws from the rear housing and remove the rear housing (see illustration below). All switches should be set to factory-set configuration except as where noted below.
3. Remove the wired connector from the back of the interface unit and install the Test Connector in place of the wired connector.

Note: Insure that test connector pins line up properly with pins on interface (see illustration below). Make note of the BAUD rate switch position.



4. Set the BAUD rate switch to position 3. This sets the BAUD rate to 2400.
5. Plug the Serial Interface into the back of the computer and turn the computer ON.
6. With the System Exerciser Cartridge inserted in the computer, load the System Exerciser program by executing the following:

```
SCRATCH A 
LOAD "AUTOST", 1 
```

7. After loading the System Exerciser program, the following prompt will be displayed:

```
Do you want PRINTED output? (Y/N)
```

Enter Y or N for your preference and press .

8. The following exerciser call up entry will then be displayed:

```
Enter Model # and select code...
```

To implement the 98036A Serial Interface exerciser, enter 98036A followed by the necessary select code entry. Press .

9. The following prompt will then be displayed:

```
Enter # of times to run...
```

Enter the number of times you want the exerciser performed and press . At this time

the exerciser begins. One exerciser requires approximately 10 minutes.

10. Errors detected by the exerciser will be displayed in an error message. If errors are indicated, insure that the configuration switches are set to the factory setting and carefully repeat the exerciser procedure. If errors are still indicated, contact the nearest HP Sales and Service Office for assistance.
11. When the exerciser has been satisfactorily completed, remove the Test Connector and reinstall the wired connector. Return the BAUD rate switch to its previous position, and reassemble the interface.
12. When the 98036A exerciser is completed, the following will be displayed:

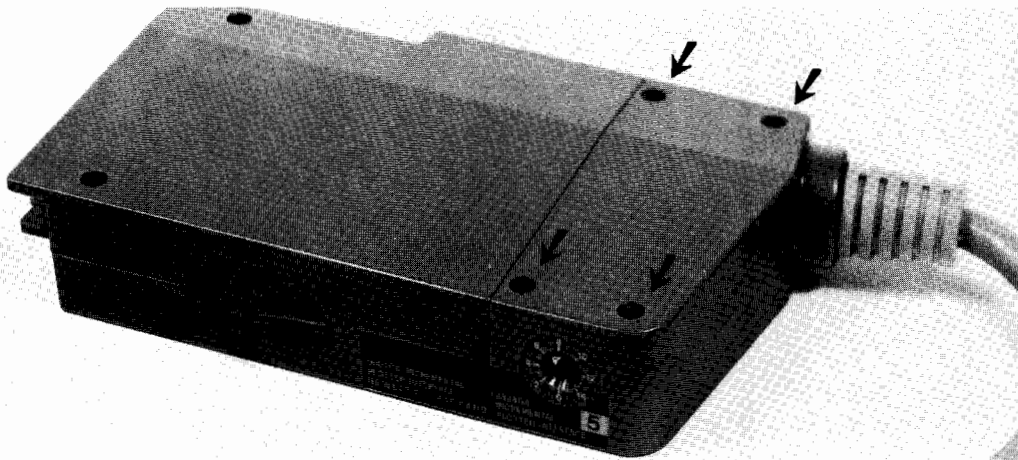
```
_ message(s), # run(s) = _ Press CONT
```

indicating the number of informational messages generated and exerciser repetitions. To continue the System Exerciser program, press .

98040A Incremental Plotter Interface

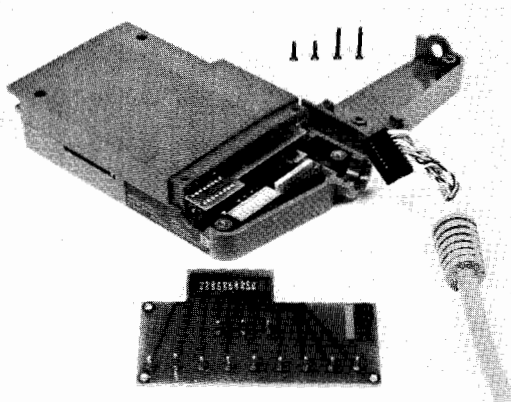
This exerciser requires an oscilloscope and a Test Connector (Part No. 98041-67940).

1. Open the rear housing of the interface by removing the four screws shown in the figure below.

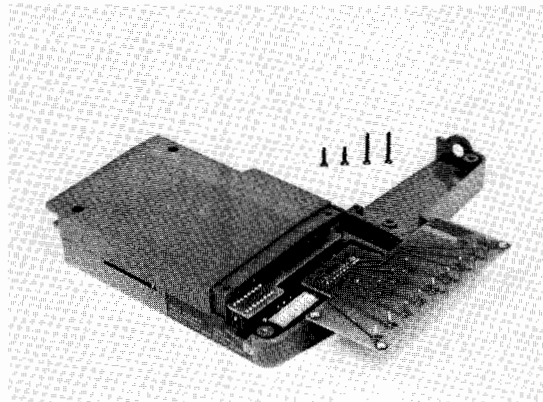


Interface Rear Housing

2. Install the Test Connector in place of the wired cable as shown in the figures below.



Interface and Test Connector



Installed Connector

3. With power OFF to the computer, install the interface in the rear of the computer.

- Turn computer power ON.
- With the System Exerciser Cartridge inserted in the computer, load the System Exerciser program by executing the following:

```
SCRATCH A 
LOAD "AUTOST", 1 
```

- After loading the System Exerciser program, the following prompt will be displayed:

```
Do you want PRINTED output? (Y/N)
```

Enter Y or N for your preference and press .

- The following exerciser call up entry will then be displayed:

```
Enter Model # and select code...
```

To implement the 98040A Interface exerciser, enter 98040A followed by the necessary select code entry. Press .

- The following prompt will then be displayed:

```
Enter # of times to run...
```

Enter the number of times you want the exerciser performed and press . At this time the exerciser begins.

- This exerciser checks various control functions of the interface by pulsing the control lines. Using the following chart, select a function to be exercised by pressing the appropriate key(s).

Key	Line Pulsed
<input type="button" value="k0"/>	Pen 1
<input type="button" value="k1"/>	Pen 2
<input type="button" value="k2"/>	Pen 3
<input type="button" value="k3"/>	Pen 4
<input type="button" value="k4"/>	Pen Up
<input type="button" value="k5"/>	Pen Down
<input type="button" value="SHIFT"/> <input type="button" value="k0"/>	+X
<input type="button" value="SHIFT"/> <input type="button" value="k1"/>	-X
<input type="button" value="SHIFT"/> <input type="button" value="k2"/>	+Y
<input type="button" value="SHIFT"/> <input type="button" value="k3"/>	-Y
<input type="button" value="SHIFT"/> <input type="button" value="k4"/>	Next Exerciser

- Connect the oscilloscope probe to the desired output test point on the Test Connector. The program will pulse the selected function line and you can observe the output waveform on the oscilloscope. (Note: For a detailed explanation of the interface control functions, refer to the HP 98040A Interface Installation and Service Manual, Part No. 98040-90000).

During the exerciser, the control function being checked will appear in a display. For example, when the Pen 1 function is being exercised, the following display will be seen:

PEN 1 NOW BEING PULSED



As you select other functions, the display will reflect the control line being pulsed.

Shown next are samples of the typical oscilloscope waveforms that should be seen during the testing of the various output lines. Listed with each wave form are the oscilloscope and the interface settings that generated the output waveform.

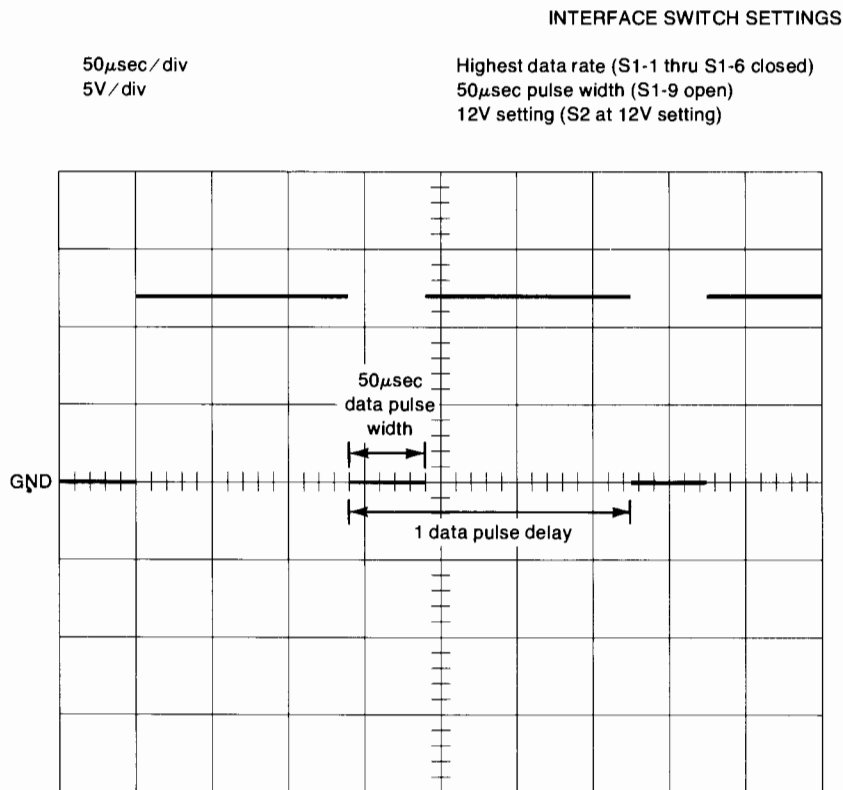


Figure 4-1:
Data Pulse Display
(+X,+Y)

The data lines are pulsed in the Repeat Data state. At higher data rates a delay of up to 10msec (caused by the computer's program execution rate and transfer delays in the interface) will appear between repeat cycles. Therefore, you should only check the data rate during the pulse repetition cycle (16 pulses per repetition) as shown in Figure 4-2.

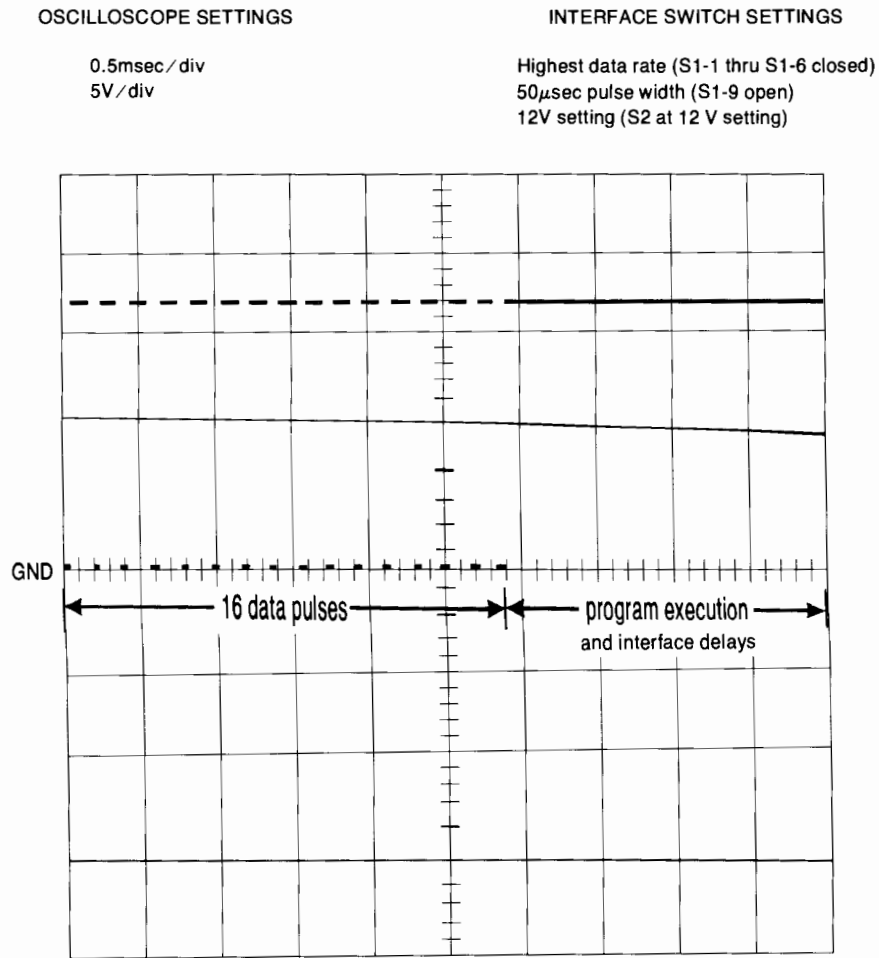


Figure 4-2:
Illustration of Repeat Mode and Delay Before Next Cycle

The Pen Up and Pen Down Pulses

The pen up and pen down pulses (shown in Figure 4-3) are similar in waveform to the data drive pulses except for the addition of the pen up or pen down delay times.

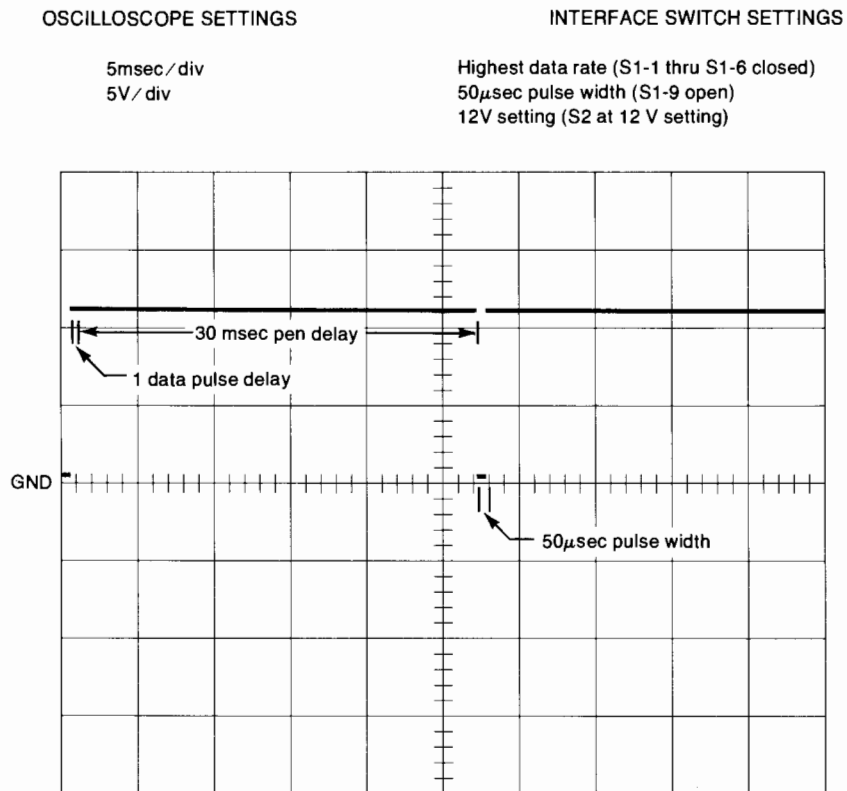


Figure 4-3:
Pen Up/Pen Down Display

The high level of the waveform is the data pulse delay followed by the pen up or pen down delay. The low level is either a 20 μ sec or 50 μ sec pulse depending upon the setting of the pulse width switch.

The latched pen select lines (pen #1 thru pen #4) should all have identical waveforms for specific switch settings. These lines all have TTL output voltage levels (0v to +5v) regardless of the position of the voltage select switch, S2.

The computer's pen statement causes the appropriate pen line to be driven low for the amount of time selected for the pen down delay followed by a data pulse delay (shown in Figure 4-4).

The high portion of the wave form consists of a pen down delay and a data pulse delay to unlatch the output before the next pen statement.

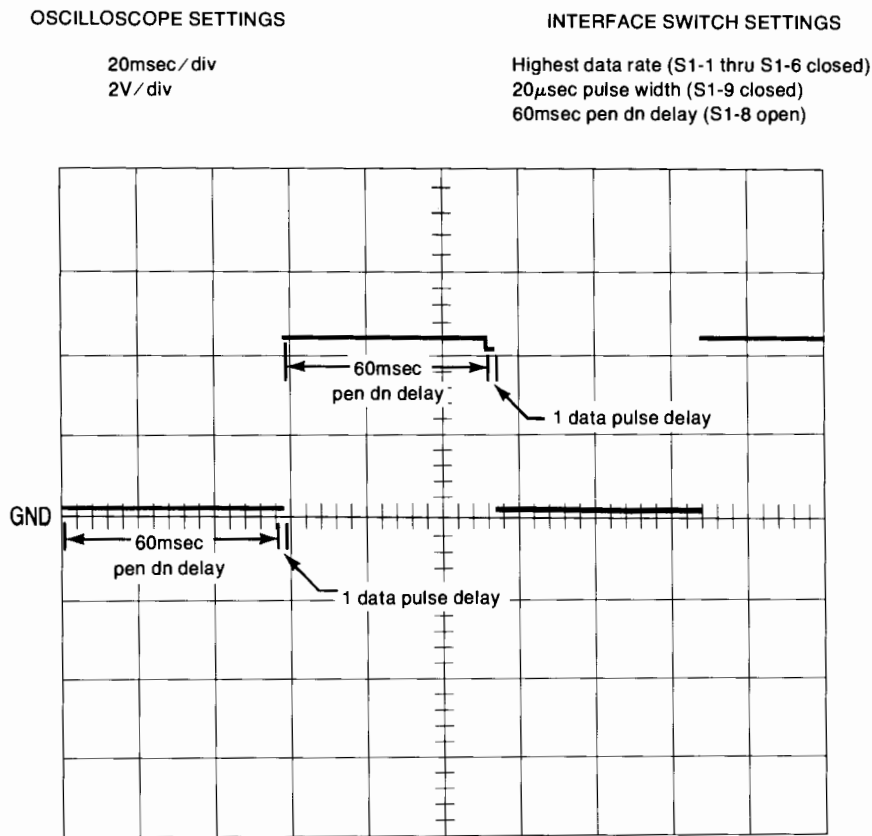


Figure 4-4:
Pen Select Display at High Data Rates

The data pulse delay is included in the pen control outputs (pen select, pen up, and pen down) to allow the monostables used to trigger the pen up and pen down delays time to recover before they are triggered again. If the data rate is relatively slow, the data delays can become a significant portion of the total pulse shown in Figure 4-5.

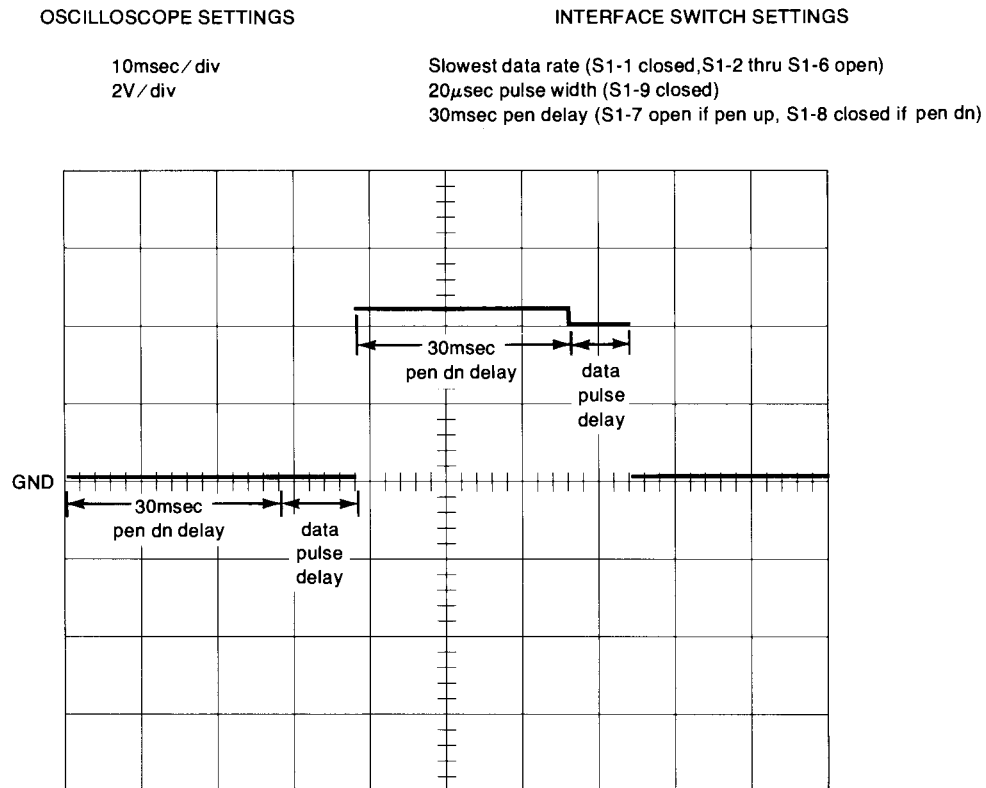


Figure 4-5:
Pen Select Display at Low Data Rates

Refer to the 98040A Interface Installation and Service Manual for more information on the output waveforms.

11. If you notice any incorrect waveforms, carefully repeat the exerciser. If errors are still indicated, contact the nearest HP Sales and Service Office for assistance.

12. When you are finished checking the interface control functions, press **SHIFT** **ka** to exit the exerciser. This will advance the System Exerciser program to the following display:

```
_ message(s), # run(s) = _ Press CONT
```

indicating the informational messages generated and exerciser repetitions. (Note: This display will indicate zero (0) messages as none are generated by this particular exerciser). To continue the System Exerciser program, press **CONT**.

13. After satisfactorily completing this exerciser, remove the Test Connector, reinstall the wired cable, and reassemble the interface.

Appendix A

System 35 Error Messages

Mainframe Errors

1	Missing ROM or configuration error
2	Memory overflow; subprogram larger than block of memory
3	Line not found or not in current program segment
4	Improper return
5	Abnormal program termination; no <code>END</code> or <code>STOP</code> statement
6	Improper <code>FOR/NEXT</code> matching
7	Undefined function or subroutine
8	Improper parameter matching
9	Improper number of parameters
10	String value required
11	Numeric value required
13	Array dimensions not specified
14	Multiple <code>OPTION BASE</code> statements or <code>OPTION BASE</code> statement preceded by variable declarative statements
15	Invalid bounds on array dimension or string length in memory allocation statement
16	Dimensions are improper or inconsistent; more than 32 767 elements in an array
17	Subscript out of range
18	Substring out of range or string too long
19	Improper value



20	Integer precision overflow
21	Short precision overflow
22	Real precision overflow
23	Intermediate result overflow
24	$\text{TAN}(N^*\pi/2)$, when N is odd
25	Magnitude of argument of <code>ASN</code> or <code>ACS</code> is greater than 1
26	Zero to negative power
27	Negative base to non-integer power
28	<code>LOG</code> or <code>LGT</code> of negative number
29	<code>LOG</code> or <code>LGT</code> of zero
30	<code>SQR</code> of negative number
31	Division by zero; <code>X MOD Y</code> with <code>Y = 0</code>
32	String does not represent valid number or string response when numeric data required
33	Improper argument for <code>NUM</code> , <code>CHR\$</code> , or <code>RPT\$</code> function
34	Referenced line is not <code>IMAGE</code> statement
35	Improper format string
36	Out of <code>DATA</code>
37	<code>EDIT</code> string longer than 160 characters
38	I/O function not allowed
39	Function subprogram not allowed
40	Improper replace, delete, or <code>REN</code> command
41	First line number greater than second
42	Attempt to replace or delete a busy line or subprogram
43	Matrix not square
44	Illegal operand in matrix transpose or matrix multiply
45	Nested keyboard entry statements

46	No binary in memory for <code>STORE BIN</code> or no program in memory for <code>SAVE</code>
47	Subprogram <code>COM</code> declaration is not consistent with main program
48	Recursion in single-line function
49	Line specified in <code>ON</code> declaration not found
50	File number less than 1 or greater than 10
51	File not currently assigned
52	Improper mass storage unit specifier
53	Improper file name
54	Duplicate file name
55	Directory overflow
56	File name is undefined
57	Mass Storage ROM is missing
58	Improper file type
59	Physical or logical end-of-file found
60	Physical or logical end-of-record found in random mode
61	Defined record size is too small for data item
62	File is protected or wrong protect code specified
63	The number of physical records is greater than 32 767
64	Medium overflow (out of user storage space)
65	Incorrect data type
66	Excessive rejected tracks during a mass storage initialization
67	Mass storage parameter less than or equal to 0
68	Invalid line number in <code>GET</code> or <code>LINK</code> operation
69-79	See Mass Storage ROM errors
80	Cartridge out or door open
81	Mass storage device failure
82	Mass storage device not present

83	Write protected
84	Record not found
85	Mass storage medium is not initialized
86	Not a compatible tape cartridge
87	Record address error; information can't be read
88	Read data error
89	Check read error
90	Mass storage system error
91-99	See Mass Storage ROM errors
100	Item in print using list is string but image specifier is numeric
101	Item in print using list is numeric but image specifier is string
102	Numeric field specifier wider than printer width
103	Item in print using list has no corresponding image specifier
104-109	Unused
110-113	See Plotter ROM errors
SystemError	Octal number; octal number This message indicates a serious error in the machine's firmware system. If reset does not bring control back, the machine must be turned off, then on again. If the problem persists, contact your HP Sales and Service Office.

I/O Device Errors

Two error messages can occur when attempting to direct an operation to an I/O device that is not ready for use. A printer which is out of paper or no device at a specified select code are examples. The first message that appears is -

```
I/O ERROR ON SELECT CODE select code
```

If the condition is not corrected, the machine beeps intermittently and the following message replaces the first -

```
I/O TIMEOUT ON SELECT CODE select code
```

The I/O device can be made usable by correcting the error (loading paper for example), then executing the `READY #` command -

```
READY # select code
```

This command readies the I/O device and the operation which was attempted is attempted again. The select code must be specified by an integer.

In some cases, such as an interface which is not connected, `READY #` for that select code may not solve the I/O error. In this case, **STOP** should be pressed to regain control of the computer. Be sure to turn the power off before inserting an interface. After the problem is remedied, the operation or program can be tried again.

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