



AUTOMATED TEST SYSTEMS

**PIN ASSIGNMENT
PROGRAM
(PAP)**

INSTRUCTION MANUAL

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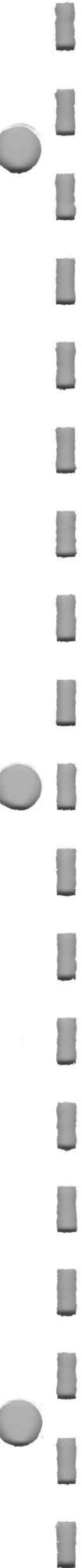
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PREFACE

This manual describes the Pin Assignment Program (PAP) for an automated test system. PAP relates sectors or sector cards to pin names used in a test program.

The Pin Assignment Program is basically the same for the 1840 Test Station as it is for the 1803 Test Station, although a few exceptions exist due to differences in the hardware configurations of the two stations. Where these differences affect the operation of the program, they will be explained; otherwise the operation of the program is identical for the two test stations.

This document assumes the reader is familiar with the general operation of the automated test system and its programming procedures.



CONTENTS

	<u>Page</u>
Nomenclature Conventions	v
Introduction	1
The Pin Assignment Line	2
Pin Assignment Program Commands	5
Error Messages	15

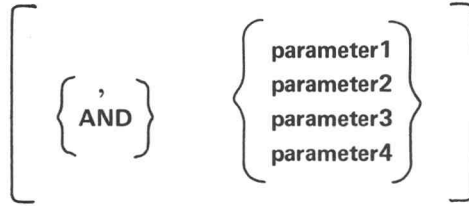


NOMENCLATURE CONVENTIONS

This manual uses a standard nomenclature to show the general form of each command and its parameters. The nomenclature conventions are:

- Parameters shown in upper case letters, special characters, and punctuation marks (including blanks) are *literal* parameters. When you use them with the command, you must type them exactly as shown in the general form.
- Parameters shown in lower case letters are *variable* parameters. When you use them with the command, you must supply a valid name or value in place of the variable name appearing in the general form. For example, the variable name *pinnum* indicates that you must specify a pin number.
- Parameters enclosed in square brackets ([]) are *optional* parameters. You may supply these parameters or not, depending on the way you wish to use the command. (Since the brackets are a nomenclature convention only, you must not type them when you use the command.)
- A vertical list of parameters enclosed in braces ({ }) indicates that you must choose one line from the list when you use the command. Which parameter you choose depends on the function you wish the command to perform. (Since the braces are a nomenclature convention only, you must not type them when you use the command.)
- A vertical list of parameters enclosed in square brackets indicates that the parameter is optional. If you decide to use the parameter, you must select one line from the vertical list shown. Which parameter you choose depends on the function you wish the command to perform.
- Parameters not enclosed in square brackets or braces are *mandatory* parameters — you must supply the parameter when you use the command.
- When the general form shows the same parameter twice, separated by an ellipsis (i.e., parameter, . . . , parameter), you may enter the parameter once or repeat it as many times as desired.

- When parameters are nested within square brackets and braces, you interpret the brackets and braces by working from the outermost pair of brackets or braces to the innermost pair. For example,



In the above example, the outermost square brackets indicate that any parameters which are enclosed within the brackets are optional parameters. The inner braces indicate that if you decide to specify the optional parameters, you must select one line from each vertical list shown.

Following the general form of the command, an explanation of all the parameters is given.

Throughout this manual the examples show user-typed information in **boldface**. Information the system prints at your terminal is shown in lightface.

In addition, this manual assumes that you type a carriage return after each line you type at your terminal. Whenever there is any doubt about the necessity of the carriage return, it is indicated by the symbol ↵. For example,

* ↵

In the above example, the ↵ symbol indicates that the user must type a carriage return after the system prints the asterisk at the terminal.

INTRODUCTION

The pin assignment program (PAP) relates sector cards or sectors to pin names chosen for use in a test program. For example:

LINE NUMBER	SECTOR NUMBER	PIN NAME	DUT PIN OR COMMENT
1.0000	1WAIO	A1	PIN1
2.0000	5WAIO	B1	PIN2
3.0000	9WAIO	O1	PIN3
4.0000	13WAIO	A2	PIN4
5.0000	17WAIO	B2	PIN5
6.0000	21WAIO	O2	PIN6
7.0000	25WAO	GND	PIN7
8.0000	37WAIO	A3	PIN8

To enter the pin assignment program from the Executive, type PAP in response to the \$; PAP's prompt, `##`, then appears. This symbol, `##`, indicates that you may enter one of several PAP commands or begin a new pin assignment line. The fields of a pin assignment line are arranged according to the following format: LINE NUMBER, SECTOR NUMBER, PIN NAME, and DUT PIN OR COMMENT. These fields are discussed below, followed by a description of PAP commands.

THE PIN ASSIGNMENT LINE

The fields of a pin assignment line follow this format: LINE NUMBER, PIN NAME, and DUT PIN OR COMMENT.

LINE NUMBER

PAP requires that you enter line numbers before all pin assignment and comment lines. Line numbers may be entered as integers from 0 to 9999, as decimals from 0.0 to 9999.9999, or as a combination of both.

A line number may be followed by a sector number or by an asterisk. To insert a comment line, enter an asterisk. Up to 60 characters in the comment line may follow the asterisk. When a line number is not followed by an asterisk, the program expects a value in the SECTOR NUMBER field, then a value in the PIN NAME field followed by an optional DUT PIN OR COMMENT field.

SECTOR NUMBER

The SECTOR NUMBER field has four parts:

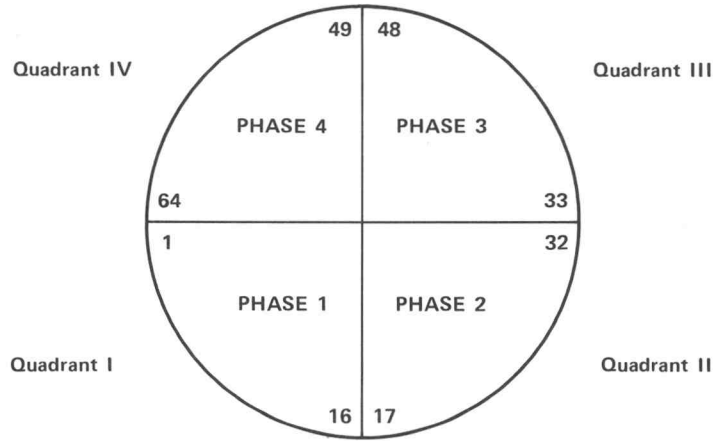
1. a sector number (1-64 for the 1803; 1-16 for the 1840) (*See note.)
2. a group character (W, X, Y, or Z)
3. a duo character (A, B, C, or D)
4. an input/output character (I and O)

The group and duo characters pertain only to the 1803 Test Station.

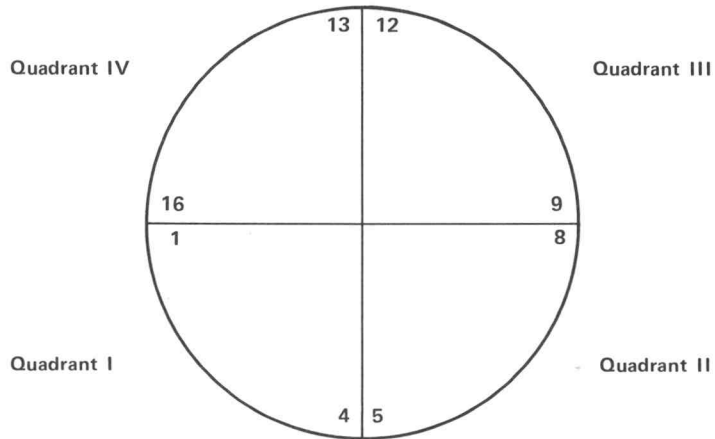
1. The *sector number* pertains to the number of the sector card (if operating an 1803 Test Station) or sector (if operating an 1840 Test Station).
2. The *group character* relates the way in which the 1803 data distributor references the sector card. Cards of the same group occur every fourth card: Card 1 (group W); Card 2 (group X); Card 3 (group Y); Card 4 (group Z); Card 5 (group W), etc. If you assign pins of the same type (such as input, data address, control, output, etc.) to sector cards of the same group (W,X,Y,Z), your program occupies less core memory or disk space and requires less time to execute. It is not necessary, however, to assign group characters; PAP calculates the appropriate group character when none is specified.

NOTE

The 1840 Test Station has only 16 sectors while the 1803 has up to 64 sector cards. Sectors of the 1840 or sector cards of the 1803, however, are similarly assigned to four quadrants (I-IV). On the 1803, these quadrants correspond to four phases of the 2941 clock generator used in conducting timed measurements. Clock phases 1-4 correspond to quadrants I-IV. These phases, however, are only applicable to the 1803 Test Station. See figures below.



1803 Test Station Sector Card Quadrant Division



1840 Test Station Sector Quadrant Division

3372-01

3. The *duo character* allows for future expansion of the system. It is not necessary to specify this character; the program automatically defaults to duo character A.
4. The *I and O character* establishes the sector or sector card as either an input or an output to a specified pin of the DUT. It is possible for the sector or sector card to be designated as both an input and an output (IO), in which case a shorting strap is usually wired to the socket card.

PIN NAME

The PIN NAME field relates the sector number and pin type to a pin name. These names, not the sector numbers, are used in test program writing. Therefore, before translating your program, you must create a pin assignment table to establish this relationship. The pin names must be unique for each sector. A pin name can be up to six alphanumeric characters; the first must be a letter.

DUT PIN OR COMMENT

The DUT PIN OR COMMENT field is for your reference only. The system ignores this field when executing the test program. Up to 40 characters may be entered.

Following is an example of a PAP program output as it would be listed on an output device:

```

## LIST

LINE      SECTOR  PIN    DUT PIN
NUMBER    NUMBER  NAME   OR COMMENT

10.1000   1WAI    PIN1   0017
10.2000   2XAI    PIN2   0103
10.3000   3YAI    PIN3   0002
20.1000   4ZAI0   PIN4   0018
30.1000   5WAO    PIN5   POWER OUT
40.0000   * THIS IS A PAP TABLE FOR 7407

##

```

NOTE

When a PAP program output is listed — regardless if for an 1803 or 1840 Test Station — the group and duo characters of the sector number are supplied and displayed even though they may not have been specified by the user.

PIN ASSIGNMENT PROGRAM COMMANDS

COMMAND	FORMAT	PURPOSE
ERASE	ERASE, { linenum[,linenum] ALL	Erase lines in the scratch area.
EXIT	EXIT	Return program control to the executive.
INPUT	INPUT [DKn; DK; DKS;] filnam[.PIN][:uid]	Input an existing file or create a new file.
LIST	LIST[,linenum[,linenum]]	List the program in the scratch area.
PRINT	PRINT	List the program on the line printer.
PUNCH	PUNCH	Punch an ASCII tape.
READ	READ, { TAPE CARD	Input a file from an ASCII tape or punched cards.
RESEQ	RESEQ	Renumber the line numbers in each part of the text.
SAVE	SAVE [DKn; DK; DKS;] filnam[.PIN][:uid]	Save the contents of the scratch area on the disk.



Creating a Table

When creating a pin assignment table, you can type INPUT to the PAP prompter or simply type the pin assignment line itself. Entering the command, INPUT, with no parameters, causes PAP to display the headings: LINE NUMBER, SECTOR NUMBER, PIN NAME, and DUT PIN OR COMMENT. The prompter, #, then returns. In the example below, the tab key was used to provide spacing, although only one space is required between fields.

```
$PAP
PAP
#INPUT
  LINE      SECTOR    PIN      DUT PIN
  NUMBER    NUMBER    NAME     OR COMMENT
#10.1      11        PIN1     0017
#10.2      21        PIN2     0103
```

or

```
$PAP
PAP
#10.1      11        PIN1     0017
#10.2      21        PIN2     0103
```

Inputting a Table

To input a table already stored on a drive, type INPUT followed by the file name. This places the file in the scratch area where it may be listed, erased, appended, etc. The PAP prompter then returns. The format is:

```
INPUT [ [DKn;
        ,DK;  filnam[.PIN][:uid]
        DKS; ] ]
```

It is necessary to specify the disk number, DKn, if the table which you want to input is on a disk other than the user's current drive. DK selects the current drive; DKS selects the system drive (the drive which is used to boot the system). PAP expects the file type .PIN and (unless specified otherwise) the currently specified user identification code (:uid).

It is not necessary to supply any information other than the file name unless (a) the file is on a drive other than the current one, or (b) the user identification code is other than the one currently specified.

Saving a Table

To save PAP.s scratch area, you may specify SAVE following by an optional disk number and filename. The format is:

```
#SAVE,  $\left[ \begin{array}{l} \text{DKn;} \\ \text{DK;} \\ \text{DKS;} \end{array} \right] \text{filnam}[\text{.PIN}][:\text{uid}]$ 
```

When executing a SAVE — unless specified otherwise — the program saves the table on the current drive.

If you issue SAVE without a filename, PAP saves the file under the last INPUT filename used. For example:

```
#INPUT PINS1
.
.
.
#SAVE
UNDER FILE NAME DK0;PINS1.PIN:SYS
#
```

PAP deletes the old file, DK0;PINS1.PIN:SYS and replaces it with the new version under DK0;PINS1.PIN:SYS, the original file descriptor.

You may also save the table under a different filename than the one input. The contents of the original file remain unchanged on the disk. For example:

```
#INPUT,PINS1
.
.
.
#SAVE,PINS2
```

PINS1 remains unchanged on the disk and PINS2 contains the contents of the scratch area.

If PINS2 already exists on the disk, the following message appears:

```
FILE ALREADY IN DIRECTORY
```

```
DELETE? < Type Y or YES if you wish to delete the
original contents of PINS1. Type N or
NO if you wish to continue working in
PINS1.
```


Listing a Table

LIST displays on the terminal the specified line or range of lines from the scratch area. LIST with no parameters lists the entire table. For example:

LIST

DK0;SAMPLE.PIN:SYS DATE: 01-DEC-75 TIME: 00:01:46

LINE NUMBER	SECTOR NUMBER	PIN NAME	DUT PIN OR COMMENT
1.0000	1WAI	PINA	
5.0000	2XAI	PINB	
10.0000	3YAI	PINC	
10.2000	4ZAI	PIND	
10.4000	5WAI	PINE	
10.7000	6XAI	PINF	
10.8000	7YAI	PING	
10.9900	8ZAI	PINH	
11.0000	9WAI	PINI	
20.0000	10XAI	PINJ	
20.2000	13WAI	PINM	
20.3000	11YAI	PINK	
20.3030	12ZAI	PINL	

#

Note that PAP's prompter does not appear before each line of a listing. In addition, PAP extends the step portion of the line number to four digits, formats pin assignment line, and calculates the group and duo characters.

LIST followed by a line number or two line numbers prints selected parts of the scratch area. For example:

- # LIST, 10. (Lists line 10.)
- # LIST, 10 (Lists lines 10.0 through 10.9999 inclusive.)
- # LIST, 10,20 (Lists lines 10.0 through 20.0 inclusive.)

Renumbering a Table

The RESEQ command renumbers line numbers in ascending numerical order. For example:

DK0;SAMPLE.PIN:SYS DATE: 01-DEC-75 TIME: 01:29:13

LINE NUMBER	SECTOR NUMBER	PIN NAME	DUT PIN OR COMMENT
1.0000	1WAI	PINA	
5.0000	2XAI	PINB	
10.0000	3YAI	PINC	
10.2000	4ZAI	PIND	
10.4000	5WAI	PINE	
10.7000	6XAI	PINF	
10.8000	7YAI	PING	
10.9900	8ZAI	PINH	
11.0000	9WAI	PINI	
20.0000	10XAI	PINJ	
20.2000	13WAI	PINM	
20.3000	11YAI	PINK	
20.3030	12ZAI	PINL	

A RESEQ command causes PAP to renumber the table in the following manner:

#RESEQ
#LIST

DK0;SAMPLE.PIN:SYS DATE: 01-DEC-75 TIME: 01:30:27

LINE NUMBER	SECTOR NUMBER	PIN NAME	DUT PIN OR COMMENT
1.0000	1WAI	PINA	
2.0000	2XAI	PINB	
3.0000	3YAI	PINC	
4.0000	4ZAI	PIND	
5.0000	5WAI	PINE	
6.0000	6XAI	PINF	
7.0000	7YAI	PING	
8.0000	8ZAI	PINH	
9.0000	9WAI	PINI	
10.0000	10XAI	PINJ	
11.0000	13WAI	PINM	
12.0000	11YAI	PINK	
13.0000	12ZAI	PINL	

#

Inserting an Entry

By selecting an unused line number, lines can be inserted or rearranged in the scratch area. For example:

DK0;SAM.PIN:SYS DATE: 12-DEC-75 TIME: 03:00:39

LINE NUMBER	SECTOR NUMBER	PIN NAME	DUT PIN OR COMMENT
1.0000	1WAI	PINA	
5.0000	2XAI	PINB	
10.0000	3YAI	PINC	
10.2000	4ZAI	PIND	
10.4000	5WAI	PINE	
10.7000	6XAI	PINF	
10.8000	7YAI	PING	
10.9900	8ZAI	PINH	
#10.2001	3IO	IN2	INSERT
#10.8010	5IO	IN2	INSERT

Entering the LIST command causes PAP to list the above in numerical order.

LIST

DK0;SAM.PIN:SYS DATE: 12-DEC-75 TIME: 03:02:41

LINE NUMBER	SECTOR NUMBER	PIN NAME	DUT PIN OR COMMENT
1.0000	1WAI	PINA	
5.0000	2XAI	PINB	
10.0000	3YAI	PINC	
10.2000	4ZAI	PIND	
10.2001	3YAIO	IN1	INSERT
10.4000	5WAI	PINE	
10.7000	6XAI	PINF	
10.8000	7YAI	PING	
10.8010	5WAIO	IN2	INSERT
10.9900	8ZAI	PINH	

#

Appending an Entry

PAP allows you to add entries to the end of a table in the scratch area. Type the appended entries with line number values greater than the largest existing line number in the program. For example:

DK0;SAM.PIN:SYS DATE: 09-DEC-75 TIME: 04:17:00

LINE NUMBER	SECTOR NUMBER	PIN NAME	DUT PIN OR COMMENT
1.0000	1WAI	PINA	
5.0000	2XAI	PINB	
10.0000	3YAI	PINC	
10.2000	4XAI	PIND	
10.4000	5WAI	PINE	
10.7000	6XAI	PINF	
10.8000	7YAI	PING	
10.9900	8ZAI	PINH	
#11.0000	9IO	PINJ	
#11.0101	10I	PINK	
#13.0000	41O	PINL	

PAP lists the following:

#LIST

DK0;SAM.PIN:SYS DATE: 09-DEC-75 TIME: 04:18:30

LINE NUMBER	SECTOR NUMBER	PIN NAME	DUT PIN OR COMMENT
1.0000	1WAI	PINA	
5.0000	2XAI	PINB	
10.0000	3YAI	PINC	
10.2000	4ZAI	PIND	
10.4000	5WAI	PINE	
10.7000	6XAI	PINF	
10.8000	7YAI	PING	
10.9900	8ZAI	PINH	
11.0000	9WAIO	PINJ	
11.0101	10XAI	PINK	
13.0000	41WAO	PINL	

#

Replacing an Entry

You may replace an existing line of a PAP table by retyping the line number followed by the new line of text. For example:

```
##6      21WAO      OUT2
.
.
.
##6      1WAI0      BOTH2
```

An entry retyped with the same pin name as an existing entry is flagged with a ? and does not replace the old entry.

Erasing an Entry

The ERASE command deletes a specific entry or range of entries from the scratch area. ERASE must be followed by a line number, two line numbers, or the word ALL. For example:

```
##ERASE,2.0      (Erases the line numbered 2.0000.)
##ERASE,2,7.0    (Erases the lines numbered 2.0000
                  through 7.0000 inclusive.)
##ERASE,ALL      (Erases the entire contents of the
                  scratch area.)
```

Printing Lines on the Line Printer

The PRINT command prints the contents of the PAP scratch area on the line printer. For example:

```
##PRINT          (Only the entire contents of the scratch
                  area may be printed.)
```

Punching an ASCII Tape

The PUNCH command punches an ASCII tape of the contents of the PAP scratch area.

```
##PUNCH         (Only the entire contents may be punched.)
```

**Reading an ASCII
Tape**

The READ,TAPE command reads an ASCII paper tape into the PAP scratch area. The read-in data is appended to any information already in the scratch area. However, if the read-in data has the same line numbers as the existing data in the scratch area, the read-in data replaces the existing data.

The read the ASCII paper tape, place it onto the tape reader and type:

##READ,TAPE

(READ,TAPE has a similar relationship to LOAD as PUNCH has to BACKUP. READ,TAPE reads in only ASCII-formatted tapes whereas LOAD reads in only special binary-formatted tapes.)

Reading Cards

The READ,CARD command reads cards only in IBM 029 code into the PAP scratch area. The read-in data is appended to any information already in the scratch area. However, if the read-in data has the same line numbers as the existing data in the scratch area, the read-in data replaces the existing data.

To read cards, place them in the card reader and type:

##READ,CARD

EXIT

This command terminates PAP and returns control to the Executive.

ERROR MESSAGES

NOT A PIN ASSIGNMENT FILE means that the file that you tried to input from the disk is not a pin assignment file.

FILE NOT FOUND means that the file that you tried to input does not exist on the disk.

FILE IS BUSY means that the file is open/busy. Use the Executive's CLOSE command.

NO DATA means that you tried to save work from the scratch area without having input a table.

SCRATCH NOT SAVED indicates that you did not specify saving your work from the scratch area before using EXIT. You can reissue the EXIT command if you do not want to save the scratch area contents.

? is a general error message that indicates a misspelled word, or that PAP does not understand something you have entered.

NOT A RECOGNIZED COMMAND – illegal command.

FILE ALREADY IN DIRECTORY
DELETE?
Type Y for yes, N for no.

ILLEGAL NAME

FILE IS PROTECTED
You tried to delete a protected file.

DISK FULL
Run CUP. (See *Command Language Reference Manual; Disk Packing Utility* section.)

DIRECTORY FULL

Too many files are stored on the disk — delete some.

DEVICE NOT AVAILABLE

DISK HARD ERROR

- 1) drive is not ready
- 2) drive is write protected
- 3) faulty disk pack or defective hardware

DKn IS OFFLINE

This message appears when you try to input from or save on a drive that has not been put online by using the **ONLINE** command.