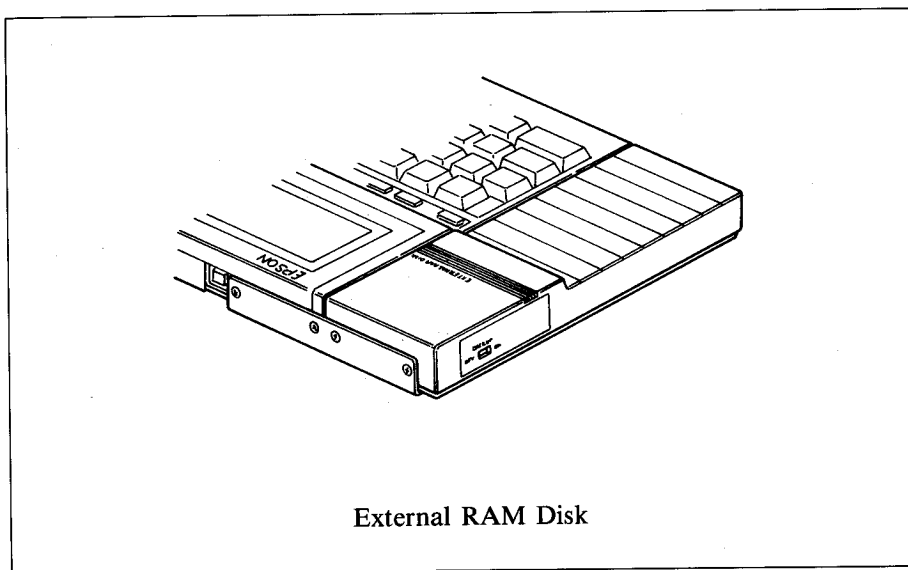


4.7.3 DIP switch settings

Bit 1 of the DIP switch turns memory backup on or off, and bits 2 and 3 are set according to ROM capacity. Switch settings for different ROM capacities are as follows.

ROM capacity/type	SW2 setting	SW3 setting
8K bytes (27064)	K	A
16K bytes	K	A
32K bytes (270256)	K	A
64K bytes	1M	A
128K bytes (HN62301, etc.)	1M	A

Further information is given in the external RAM disk instructions and with instructions supplied with ROM capsules.



External RAM Disk

Chapter 5

UTILITY ROM

EPSON supplies many useful utility programs for PX-4, and some of these are available in ROM form. The utility ROM contains standard CP/M transient commands (PIP and STAT) and utilities which have been developed by EPSON for PX-4 (CONFIG, TERM and FILINK).

The utility ROM must be installed in a ROM capsule. See Section 2.10 for ROM capsule installation instructions.

5.1 CONFIG

The CONFIG program is used to set those system parameters which are not changed very often. It is complementary to the System Display, and the current values of some of the parameters changed by the CONFIG program are shown on the System Display. The CONFIG program can also be used to check the settings of parameters not shown on the System Display.



WARNING:

Do not switch off PX-4 (either manually or by allowing the auto power-off function to operate) after changing the RAM disk or USER BIOS size without exiting from the CONFIG program. If PX-4 is switched off, the RAM disk contents could be destroyed and it might be necessary to re-initialise the system.

When CONFIG is started, (either from the MENU or CP/M command line), the screen shows the following:

```

*** MAIN MENU ***          CONFIG V1.0
  Select alphanumeric or ESC to exit.
0=consecutive settings    6=disk drives
1=auto power off         7=RAMdisk, user BIOS
2=CP/M function key     8=communication
3=country                9=screen mode
4=cursor                 A=printer (serial)
5=date & time
    
```

The CONFIG program is used in almost the same way as the System Display, but it has 11 options. As with the System Display the **[ESC]** key is used to move back to the main menu and to exit. The **[0]** key is used to display option menus.

5.1.1 Auto power-off function

Press the **[1]** key from the main CONFIG menu to change the auto power-off time. The screen changes as follows.

```
*** AUTO POWER OFF ***
Set time(1 to 255) in minutes or ESC
to exit. (0 disables auto power off)

auto power off time ?
auto power off      : 5
```

The value shown next to the semi-colon on the 7th line is the current setting in minutes for the auto power-off time. This is the time which PX-4 waits before switching itself off if no key is pressed while an application program or the operating system is waiting for input. It is advisable to keep the time short; otherwise the battery will run down more quickly. The purpose of this function is to conserve the battery.

As can be seen from the display, the time can be set in one-minute increments (the maximum time is 255 minutes). The auto power-off function can also be switched off altogether by selecting option 0. After entering the desired time, press **[RETURN]**; the specified time is displayed on the 7th line. At this point, you can use the **[ESC]** key to return to the main CONFIG menu.

5.1.2 CP/M function key assignments

When option 2 is selected from the main CONFIG menu, the display changes to:

```
*** CP/M FUNCTION KEY ***
Select key No.(PF10=0) or ESC to exit. █

PF1 dir          PF6 confis█
PF2 type         PF7 submit█
PF3 stat         PF8 term█
PF4 pip          PF9 filink█
PF5 basic        PF10 EPIC█
```

These are the strings which are assigned to the programmable function keys at the top of the keyboard. The screen above shows the default settings; i.e. the strings which are assigned when the system is initialised or the reset button is pressed.

Note that some of the strings terminate in the **[CTRL] - [M]** character, which is denoted by **[M]**. These strings have a carriage return (**[CTRL] - [M]**) added to them because there is no possibility that any more characters will need to be typed following the string. For example, the **[PF6]** key can be used to run the CONFIG program as follows: On the CP/M command line, type the name of the drive containing the CONFIG program (e.g. C:), then press the **[PF6]** key. The word CONFIG appears, then a carriage return is also typed. In a few seconds, the CONFIG main menu appears on the screen.

[CTRL] - [M] is not added to all commands because some of them might require extending. For example, with DIR you might want to add the name of a drive other than the current one instead of first changing the logged-in drive. When the **[PF1]** key is pressed, the letters "DIR" are printed, then PX-4 waits for further input. If you simply press the **[RETURN]** key, the directory of the current drive will be printed. If you type "C:" and press the **[RETURN]** key, the directory of drive C: will be displayed.

To change a function key string, press the number corresponding to that **[PF]** (i.e., 1 for PF1, 2 for PF2, and so forth; remember that 0 is used for PF10). The following message is then displayed on the second line of the screen:

Terminate the function key string with HELP

The third line of the screen shows the name of the key whose function is to be changed with the cursor to the right of the name. Up to 15 characters can be assigned to each **[PF]** key. If a control key command is to be added (e.g., a line feed, **[CTRL] - [J]**), this can be added by pressing **[CTRL]** and the appropriate alphabetic key. However, in the special case of the carriage return simply pressing the **[RETURN]** key will add the characters **[M]** to denote the **[CTRL] - [M]** for the carriage return.

If you accidentally press an incorrect key, use the backspace key (**[BS]**) to erase it.

Since the **RETURN** key can be used to enter a carriage return as (**CTRL** - **M**), the **HELP** key is used to terminate the string. After pressing the **HELP** key, the **ESC** key is used to return to CONFIG's main menu.

5.1.3 Changing the character set by country

The DIP switches are normally used to set the keyboard layout. Occasionally, it is useful to be able to temporarily change the characters but not the keyboard layout so that, for example, a word processor file written in French can be read on the screen with the correct characters. Pressing the **3** key from CONFIG's main menu make it possible to select character sets of different countries for display. The menu shows:

```

*** COUNTRY ***
Select number or ESC to exit.

COUNTRY          0=ASCII          5=Italy
                  1=Denmark         6=Japan
                  2=Finland         7=Norway
: ASCII          3=France          8=Spain
                  4=Germany        9=Sweden
  
```

The country whose characters are displayed is changed by pressing the key corresponding to that country in the table on the right of the screen. The currently selected country is displayed on the 6th row on the left side of the screen. Pressing the **6** key selects the ASCII character set.

5.1.4 Setting the display cursor

If option 4 is selected from CONFIG's main menu, the display changes to:

```

*** CURSOR ***
Select number or ESC to exit.

cursor tracking : vertical 1=on    2=off
                  3=vertical
cursor display  : on      4=on    5=off
cursor type     :      6=    7=
                  8=    9=
  
```

The left side of the screen shows the current status of parameters which can be altered by this section of the CONFIG program. The right part of the screen shows which keys will change these parameters, parameter settings are altered simply by pressing the appropriate key. For example, if the **9** key is pressed, the left hand side of the screen will show “_” to indicate that type of cursor is selected.

Keys **1** and **2** switch the tracking mode on and off. In the tracking mode, the cursor follows the window as it moves through the virtual screen. In the non-tracking mode, the window is locked to a particular part of the virtual screen and the cursor (the position where characters are input or where PX-4 displays the next character) moves through the virtual screen; thus, the cursor disappears when it moves outside the window.

5.1.5 Setting the date and time

The date and time can be set by selecting option 5 of CONFIG's main menu. The time is entered the moment the **RETURN** key is pressed. When the date is input, the day of the week is calculated automatically.

When option 5 is selected from CONFIG's main menu, the display changes to:

```

*** DATE & TIME ***
Select date and time or ESC to exit.

Date as MM/DD/YY ?

Date      : 01/16/88 (TUE)
Time      : 21:37:34
  
```

At this point, PX-4 is waiting for the date to be input; however, simply pressing the **RETURN** key will switch it to time input. To input the date, type the month, day and the last two digits of the year, separating each item from the following one with a slash (“/”). If you make any mistakes, use the **BS** key to back up and erase. Items consisting of a single digit need not be preceded by a zero; however, data must be entered for all these items (month, day, and year) or an error will be detected and the input line cleared. The data is entered when the **RETURN** key is pressed. If an illegal date is entered (e.g., if the specified day of the month is greater than the number of days in that month), the input line is cleared to allow the date to be entered again.

Change the time by inputting the hour, minute and second, with a colon between each. If you make any mistakes, use the **[BS]** key to back up and correct. When the desired time has been entered, press the **[RETURN]** key to enter it into the computer's memory. PX-4 starts updating the time when the **[RETURN]** key is pressed.

When a date has been entered, the display changes to time input.

Press the **[ESC]** key at any time to return to CONFIG's main menu.

5.1.6 Disk drive assignments

Selecting option 6 from CONFIG's main menu cause's the screen to change as follows:

```

*** DISK DRIVES ***
Select disk name or ESC to exit.
A:RAMdisk  F:FDD3      0=RAMdisk  0=FDD3
B:ROMcpe1  G:FDD4      1=ROMcpe1  0=FDD4
C:ROMcpe2  I:RAMcrt   2=ROMcpe2  7=RAMcrt
D:FDD1     J:ROMcrt1   3=FDD1     0=ROMcrt1
E:FDD2     K:ROMcrt2   4=FDD2     9=ROMcrt2
  
```

First, select a logical drive name by pressing **[A]** to **[K]**, but not **[H]**. Other keys other than **[A]** to **[K]**, (except **[H]**) and **[ESC]** are ignored. For example, pressing **[A]** causes the screen to change as follows:

```

*** DISK DRIVES ***
Select disk number. A:
A:RAMdisk  F:FDD3      0=RAMdisk  0=FDD3
B:ROMcpe1  G:FDD4      1=ROMcpe1  0=FDD4
C:ROMcpe2  I:RAMcrt   2=ROMcpe2  7=RAMcrt
D:FDD1     J:ROMcrt1   3=FDD1     0=ROMcrt1
E:FDD2     K:ROMcrt2   4=FDD2     9=ROMcrt2
  
```

Select the physical drive which is to be assigned to the first logical drive selected by typing a number 0 to 9. Keys other than 0 to 9 are ignored.

The microcassette drive is always drive H:, and thus is not shown in this menu. The terms FDD1, FDD2, FDD3 and FDD4 refer to external Floppy Disk Drives which can be connected to PX-4 via the serial interface.

5.1.7 RAM disk & user BIOS

This option is used to change the amount of memory set aside for the RAM disk and user BIOS areas.

When option 7 is selected from CONFIG's main menu, the screen changes as follows:

```

*** RAM DISK & USER BIOS ***
Set parameter or ESC to exit.
RAM disk size ?

RAM disk size      :      26K bytes
Max. RAM disk size is 35K bytes
User BIOS size     :           0 pages
Max. user BIOS size is 38 pages
  
```

The current RAM disk size is shown on the fifth line, and can be changed by typing 0 or a number from 2 to 35. If the size is reduced, any files presently in the RAM disk will be destroyed. However, files are not destroyed if the RAM disk size is increased. The RAM disk size typed is temporarily stored in memory when the **[RETURN]** key is pressed, but the input line is merely cleared if an illegal value has been entered. If the value entered is less than the current value, the following message and a blinking cursor are displayed on the fourth line of the screen.

RAM disk will be destroyed (Y/N) ?

If the **[Y]** key is pressed, the new RAM disk size becomes effective and existing RAM disk files are destroyed. If the **[N]** key is pressed, the fourth line is cleared and the "RAM disk size ?" message is displayed again.

When the **[RETURN]** key is pressed, the third line of the screen changes as shown below.

```

*** RAM DISK & USER BIOS ***
Set parameter or ESC to exit.
User BIOS size(256 bytes/page) ? █

RAM disk size      :      26K bytes
Max. RAM disk size is 35K bytes
User BIOS size     :           0 pages
Max. user BIOS size is 38 pages
  
```

The current user BIOS size is shown on the seventh line, and can be changed by typing in a new size in 256-byte pages. If the value input is less than the current value, the following message is displayed on the fourth line.

hook initialization (Y/N) ?

If the **[Y]** key is typed, all hooks are initialized and the new BIOS size is set. If the **[N]** key is pressed, the message disappears and CONFIG waits for you to type in some other value.

If an intelligent RAM disk is connected, its size cannot be extended using part of PX-4's main memory. In this case, the screen appears as shown below when option 7 is chosen from CONFIG's main menu, and only the size of the user BIOS area can be changed.

```

*** RAM DISK & USER BIOS ***
Set parameter or ESC to exit.
User BIOS size(256 bytes/page) ?

RAM disk size      : 128K bytes
<<An external RAM disk is connected>>
User BIOS size    : 6 pages
Max. User BIOS size is 142 pages
  
```

The **[ESC]** key can then be used to return to CONFIG's main menu.



WARNING:

Do not switch off PX-4 (either manually or by allowing the auto power-off function to operate) after changing the RAM disk size without exiting from the CONFIG program. If PX-4 is switched off, the RAM disk may be destroyed and it may also be necessary to re-initialise the system.

5.1.8 Communications

Option 8 on CONFIG's main menu is used to set communications parameters.

The RS-232C interface or direct modem is used to transmit data to and from PX-4. For example, if a text file has been written on PX-4 and it needs to be transferred to desk top computer such as the EPSON QX-10, the file can be sent to the other computer using the TERM or FILINK program in the CP/M UTILITY ROM. The two computers can either be connected directly by cable, or through a telephone line.

When option 8 is chosen from CONFIG's main menu the screen changes to display:

```

*** COMMUNICATION ***
Select alphanumeric or ESC to exit.

bit rate  1=38400      6=1200      B=110
           2=19200     7=600       C=75/1200
           3=9600      8=300       D=1200/75
           4=4800      9=200       (TX/RX)
           5=2400     A=150
  
```

The bit rate (number of bits per second or baud rate) currently set is shown on the fifth line. It can be changed to various settings using keys **[1]** to **[9]** and **[A]** to **[D]**. Keys **[1]** to **[9]**, **[A]** and **[B]** set the same bit rates in both directions (send and receive). The **[C]** and **[D]** keys set different bit rates for transmitting and receiving. The **[C]** key sets 75 bps for send and 1200 bps for receive, and the **[D]** key sets 1200 bps for send and 75 bps for receive.

Pressing the **[ESC]** key returns to CONFIG's main menu. Pressing the **[RETURN]** changes the screen as follows.

```

*** COMMUNICATION ***
Select alphanumeric or ESC to exit.

data bits:  8          1=7          2=8
parity:     none      3=none      4=odd    5=even
stop bits:  2          6=1          7=2
xon/xoff:   disable  8=disable  9=enable
ei/so:      disable  A=disable  B=enable
  
```

The number of data bits (i.e., the number of bits per character) is shown on the fourth line and can be changed using the [1] and [2] keys.

The type of parity used is shown on the fifth line and can be changed using the [3], [4] and [5] keys.

The number of stop bits is shown on the sixth line and can be changed using the [6] and [7] keys.

The Xon/Xoff control setting is shown on the seventh line and can be changed using the [8] and [9] keys.

The si/so control setting is shown on the eighth line and can be changed using the [A] and [B] keys.

After all parameters have been set or checked, the [ESC] key returns PX-4 to CONFIG's main menu.

5.1.9 Screen

This option is used to change the screen configuration. When option 9 is selected from CONFIG's main menu, the screen changes as follows, with a blinking cursor on the fourth line.

```
*** SCREEN ***
Set screen parameter or ESC to exit.
virtual screen size(horizontal) ? █
virtual screen size(40,80x8-50): 80 x 25
horizontal scroll step(20,40) : 20
vertical scroll step(1-8) : 1
```

The current virtual screen size is shown on the sixth line. You can type in 40 or 80 as the horizontal size of the virtual screen when the "virtual screen size (horizontal)?" prompt is displayed. If a number other than 40 or 80 is typed, the input line is cleared when the [RETURN] key is pressed, but nothing else changes. If a valid number has been entered, the message on the fourth line changes to "virtual screen size (vertical)?".

Now you can type in as the vertical size of the virtual screen as a number from 8 to 50. If the value typed is outside of this range, the input line is cleared when the [RETURN] key is pressed, but nothing else changes.

If a valid number has been entered, the prompt on line 4 changes as follows when the [RETURN] key is pressed.

horizontal scroll step ?

You can type in 20 or 40 as the horizontal scroll step. If any other number is typed, the input line is cleared when [RETURN] is pressed, but nothing else changes.

If a valid number has been entered, the prompt on line 4 changes as follows when [RETURN] is pressed.

vertical scroll step ?

Enter the vertical scroll step as a number from 1 to 8. If any other number is typed, the input line is cleared when [RETURN] is pressed, but nothing else changes.

After changing the screen configuration, press the [ESC] key to return to CONFIG's main menu.

5.1.10 Serial printer parameters

A printer with a RS-232C interface can be connected to PX-4's serial or RS-232C connector. (The connector used for printer output is determined by the setting of bits 5 and 6 of the DIP switch in the ROM capsule compartment. See Chapter 4 of the PX-4 User's Manual for details.) The serial interface parameters for connecting such a printer can be set by selecting option A from CONFIG's main menu. When the [A] key is pressed, the screen changes to:

```
*** PRINTER (serial) ***
Select alphanumeric or ESC to exit.
bit rate      1=19200      5=1200      9=150
: 4800        2=9600       6=600       A=110
              3=4800       7=300
              4=2400       8=200
```

The current bit rate setting is shown on the fifth line and can be changed using keys [1] to [9] and key [A]. Keys other than these keys or [ESC] and [RETURN] are ignored. Pressing the [ESC] key returns to CONFIG's main menu. If the [RETURN] key is pressed, the screen changes to:

```

*** PRINTER (serial) ***
  Select alphanumeric or ESC to exit.
data bits  : 8      1=7      2=8
parity     : none   3=none   4=odd   5=even
stop bits  : 2      6=1      7=2
  
```

The current "data bits" setting is shown on the fourth line and can be changed using keys [1] and [2].

The current "parity setting" is shown on the fifth line and can be changed using keys [3], [4] and [5].

The current "stop bit setting" is shown on the sixth line and can be changed using keys [6] and [7].

Pressing the [ESC] key returns to CONFIG's main menu. If the [RETURN] key is pressed, the first screen (the bit rate selection screen) is displayed again. Keys other than the above are ignored.

5.2 FILINK

The FILINK program transfers files between PX-4 and another computer (such as another PX-4, QX-10, etc.) through the RS-232C communication line.

Software which support the FILINK communication protocol must be executed on the other computer to transfer files. Configurations which support the protocol are as follows.

Computer	Software
PX-8	FILINK.COM T and C commands of WS.COM /Join, Send and /Join, Receive commands of SC.COM
PX-4	FILINK.COM
QX-10	FILINK.COM

EPSON supplies optional cables which can be used to connect PX-4 to other EPSON computers as follows.

Other device	Cable
PX-8	# 726
QX-10 QX-20	# 725
CX-21	# 724
PX-4	# 726

5.2.1 Using FILINK

The FILINK program is loaded by keying in the drive name and FILINK, then pressing the **RETURN** key.

A>B:FILINK

The following message is then displayed.

```
FILINK © Copyright 1984 by EPSON V1.0  
A file transfer via RS-232C port.
```

```
The RS-232C status is:  
rate = 4800 bits = 8 stop = 2 parity = NONE
```

```
Use CONFIG.COM program to change  
the RS-232C status.
```

The current RS-232C settings are displayed in the fifth line of the initial screen. However, these settings cannot be changed from the FILINK program. Therefore, use the CONFIG program to establish appropriate RS-232C settings before executing FILINK.

Press any key; the following message is then displayed.

```
Press ESC to restart, STOP to exit  
from FILINK or CTRL/STOP to abort.  
Send or Receive (S/R) ?
```

If files are to be sent, enter S; if files are to be received, enter R.

If Send is selected, FILINK asks what file is to be sent. Respond by entering the drive name (if the file is in a drive other than the current drive), file name, and extension. Ambiguous file names can be specified using wildcard characters (* and ?). If the other computer is ready, FILINK starts sending the specified file when the **RETURN** key is pressed. An example is shown below.

```
Send or Receive (S/R) ? s  
Enter file name * com [RETURN]
```

```
DATA1 .COM  
Sending .....
```

```
DATA2 .COM  
Sending .....  
DATA3 .COM  
Sending .....  
DATA4 .COM  
Sending .....  
DATA5 .COM  
Sending .....  
Done  
eXit or Continue (X/C) ?
```

The name of each file is displayed as it is sent. Periods displayed following the file names each indicate output of 128 bytes of data (these periods are also displayed following file names when files are received).

The message "eXit or Continue (X/C) ?" is displayed after file output (or input) has been completed to ask whether FILINK operation is to be continued or ended. If operation is to be ended, input X to return to the system. If it is to be continued, input C; operation then resumes with the "Send or Receive (S/R) ?" prompt.

On the receiving side, the screen appears as shown in the example below when ambiguous file names are used to receive files.

```
Send or Receive (S/R) ? r  
Enter file name * COM [RETURN]  
DATA1 .COM → DATA1 .ABC  
Receiving .....  
DATA2 .COM → DATA2 .ABC  
Receiving .....  
DATA3 .COM → DATA3 .ABC  
Receiving .....  
DATA1 .COM → DATA1 .ABC  
Receiving .....  
DATA4 .COM → DATA4 .ABC  
Receiving .....  
Done  
eXit or Continue (X/C) ?
```


When files are received without specifying any file name, they are stored on the disk under the file name which is received from the sending side. An example follows.

```
Send or Receive (S/R) ? r
Enter file name
DATA1 .COM → DATA1 .COM
  Receiving.....
DATA2 .COM → DATA2 .COM
  Receiving.....
DATA3 .COM → DATA3 .COM
  Receiving.....
DATA1 .COM → DATA1 .COM
  Receiving.....
DATA4 .COM → DATA4 .COM
  Receiving.....
Done
eXit or Continue (X/C) ?
```

If a file with the same name is already present on the disk (on the receiving side), FILINK displays the following message to ask whether the existing file is to be overwritten.

Overwrite (Y/N) ?

If Y is input in response to this message, the existing file is overwritten with the file which is received; if N is input, a message prompting for input of a different file name is displayed. This file name is only effective for one file, regardless of whether it is specified using wildcard characters. This is illustrated in the example below.

```
Send or Receive (S/R) ? r
Enter file name
FILE2 .DAT → FILE2 .DAT
Overwrite (Y/N) ? Y
  Receiving.....
FILE3 .DAT → FILE3 .DAT
Overwrite (Y/N) ? N
Enter file name ????.DAT
FILE3 .DAT → FILE6 .DAT
  Receiving.....
```

5.2.2 Functions of special keys

The following keys perform special functions.

(1) ESC

Pressing the **ESC** key while the program is waiting to receive files starts program execution over from its beginning.

(2) STOP

Pressing the **STOP** key while the program is waiting to receive files interrupts processing and terminates the program.

(3) CTRL/STOP

Pressing the **CTRL** and **STOP** keys together while the program is waiting to receive files or is sending files interrupts processing and aborts program execution.

5.2.3 Errors

When an error occurs during FILINK operation or a condition exists which requires a user decision, it is detected by the program and a message is displayed. Messages displayed for each error/condition and procedures for handling them are as follows.

(1) File not found

Cause: The specified output file does not exist.

Handling: Respecify using the correct file name.

(2) No file name specified

Cause: An attempt was made to send without specifying a file name.

Handling: Specify the file name.

(3) Bad file descriptor

Cause: The file name specified does not conform to the rules for specifying file descriptors.

Handling: Correctly specify the file name.

(4) Drive select error

Cause: A drive name other than A: to K: was specified.

Handling: Specify a drive name from A: to K:.

(5) Overwrite (Y/N) ?

Cause: This message is issued on the receiving side when a file with the specified name already exists.

Handling: Type in Y or N. If Y is input, the existing file is overwritten; if N is input, FILINK prompts for specification of another file name.

(6) Communication error

Press ESC to restart, STOP to exit from FILINK.

Cause: A communication error (framing or overflow error) occurred, or the same communication parameters (word length, parity, baud rate, etc.) are not set on the sending and receiving computers.

Handling: When this message appears, keys other than the following are ignored and the file being transferred must be resent from the beginning.

ESC Restarts the program.
STOP Ends the program.

When this message is displayed because the communication parameters have not been correctly set, end FILINK execution and re-specify the RS-232C settings with the CONFIG command.

(7) Directory full

Press ESC to restart, STOP to exit FILINK.

Cause: The directory space on the destination disk is full.

Handling: When this message appears, keys other than the following are ignored.

ESC Restarts the program.
STOP Ends the program.

Change to another disk, then start the FILINK program again. The file being transferred when the error occurred must be resent from the beginning.

(8) Disk full

Press ESC to restart, STOP to exit FILINK.

Cause: There is no free space left on the destination disk.

Handling: When this message appears, keys other than the following are ignored.

ESC Restarts the program.
STOP Ends the program.

Change to another disk, then start the FILINK program again.

(9) Close error

Cause: An error occurred while a file was being closed.

Handling: Change to another disk, then start the FILINK program again.

(10) Sender is not ready

Cause: The sending computer did not become ready to send within 10 seconds of the time the receiving side began waiting for file transmission. Or, the RS-232C cable is not connected to the receiving computer.

Handling: Make sure that the sending computer is ready to send and that the RS-232C cable is connected, then continue operation.

(11) Receiver is not ready

Cause: The receiving computer did not become ready to receive within 10 seconds of the time the sending computer became ready to send.

Handling: Make sure that the receiving computer is ready to receive, then continue operation.

(12) RS-232C is not ready

Cause: The RS-232C cable is not connected to the sending computer.

Handling: Make sure that the RS-232C cable is connected, then continue operation.

Notes Concerning Use

(1) File names on the receiving side

- When file names are specified on the receiving side:
 - (a) When an unambiguous file name is specified on the receiving side (when wildcard characters are not used in the file specification), the file received is written to disk under that file name.
 - (b) When an ambiguous file name is specified on the receiving side (when wildcard characters are included in the file name specification), the name under which the file is written to the disk combines the unambiguous portion of the file name specified with those portions of the file name received which correspond to the wildcard characters. Spaces in the file name are padded with dollar signs (\$).
- When no file name is specified on the receiving side, the file name received is used as is. Spaces in the file name are not padded with dollar signs.

(2) Setting up the data link between the sending and receiving computers

If the sending computer becomes ready before the receiving computer, factors related to signal timing make it more likely that communication errors (framing errors) will occur at lower baud rates (1200 bps or less). To avoid this, you should make the receiving computer ready first.

- (3) Any file in the destination drive whose extension is \$\$\$ will be deleted unconditionally if it has the same file name as that under which a file is being received.
- (4) If file reception is interrupted by pressing **CTRL** + **STOP**, the file being written is deleted from the disk. However, if file reception is interrupted because the disk becomes full, the file is closed and remains on the disk; in this case, the file extension is \$\$\$.
- (5) Errors occurring during file transfer

Check data is inserted into file names and data transferred to increase communication reliability. If any data error is detected during file transfer, related characters are displayed on the screen, then FILINK resends the packet in which the error occurred. This continues until data transfer has been successfully completed.

5.3 PIP

The PIP program is used to copy files between peripherals, e.g. from disk to disk, from a disk to a printer etc. The name comes from the initial letters of the words Peripheral Interchange Program.

PIP can be used with wildcard characters to transfer all types of files. It can also be used to perform other valuable functions such as:

- Remove part of a file (either at the beginning, end or in the middle of a file).
- Convert all characters to upper case or lower case
- Join a number of files together
- Make a backup file under a different name
- Add sequential numbers to each logical line of text
- Reform the page length of a text file

There are two ways PIP can be used.

- 1) When only a single operation is required, PIP can be used by following the PIP command with a command string which designates the operation you wish to carry out. On completion of the operation the CP/M prompt is returned or the MENU display if it is switched on. When using PIP from the MENU, the command string can be typed on the MENU command line after selecting PIP.
- 2) When a number of operations are to be performed, the PIP program can be loaded into memory. The CP/M prompt (A>, B>, etc.) is replaced by a PIP prompt (an asterisk). The use of PIP in this manner is essentially the same as when only one operation is required. This method must be used in certain cases; e.g., when starting or ending file transfer using lowercase. When PIP is chosen from the MENU, the PIP screen will clear and the PIP asterisk prompt will appear unless an additional command string is entered.

Pressing the **RETURN** key, the **STOP** key or **CTRL** - **C** returns display to the MENU screen or the CP/M system prompt, whichever is set.

When using PIP, you must specify a source device/file and a destination device/file. The source device/file is always specified last.

5.3.1 Copying a file from drive to drive

Any file excepts a system file can be copied from one disk to another as follows:

```
C>PIP H:=A:INFO.DAT
```

This copies the file DEMO.DAT from drive A: to drive H: then returns to the system prompt. The file is recorded under the same filename on the new drive. The filename can be changed, for example:

```
C>PIP H:NEWNAME.DAT=A:INFO.DAT
```

By using this option to copy a file to the same drive, you can make a backup copy of a file under a different name.

Various options can be added to the end of the PIP command string. For example specifying the [V] option causes the file to be verified as it is copied:

```
C>PIP H:=A:INFO.DAT[V]
```

5.3.2 Copying a file from disk to printer

This has almost the same effect as pressing **CTRL** - **P** then asking the computer to TYPE a file:

```
C>PIP LST:=A:LETTER.TXT
```

The file is printed character by character, and words which come at the end of a line are likely to be split in the middle of the word.

A refinement of this command is to add the option [Pn]; this causes the printer will execute a form feed every n lines. This prevents lines from being printed on the perforations. For example:

```
C>PIP LST:=A:INFO.DAT[P60]
```

will force a form feed every 60 lines giving the same effect as a one-inch skip-over on paper which takes 60 lines.

An additional option makes it possible to echo the file to the screen at the same time as it is printed. This is achieved using the [E] option:

```
C>PIP LST:=A:INFO.DAT[E]
```

If both options are required, the command would be:

```
C>PIP LST:=A:INFO.DAT[P60E]
```

5.3.3 Copying a file from disk to screen

The use of this command will have the same effect as the [E] option when copying to any other device. It is also the same as using TYPE command. The format is:

```
C>PIP CON:=A:MEMO.DOC
```

One of the options that can be specified here to good effect is [N] or [N2]. This causes line number to be added at the beginning of each line in the form 01 if [N] is specified and 000001 if [N2] is specified:

```
C>PIP CON:=A:MEMO.DOC[N2]
```

In addition, all lower case characters can be converted to upper case, and vice versa, using the [U] and [L] options:

```
A>PIP CON:=A:MEMO.DOC[N2U]
```

will give

```
000001 THIS IS A LINE OF TEXT
000002 HAVE A NICE DAY
```

and

```
A>PIP CON:=A:MEMO.DOC[NL]
```

will give

```
01 this is a line of text
02 have a nice day
```

5.3.4 Copying a file to an external device

Files can be copied to external devices such as printers, disk drives and other computers by specifying the relevant output port as the destination. For instance:

```
A>PIP TTY: = A:DEMO.BAS
```

will copy the file to a printer or any other device connected to the high-speed serial output port.

5.3.5 Optional parameters available with PIP

There are nineteen options which can be used with the PIP command, including those which have been mentioned already:

1. Block mode transfer

Format [B]

This option causes the data to be transferred in blocks. (This option is provided for use with devices such as paper tape readers, and is ordinarily not used.)

Example A>PIP TEST.FIL = RDR:[B]

2. Echo to screen

Format [E]

This option causes the screen to display all the data transferred so that you can see what is being copied.

Example A>PIP LST: = TEST.FIL[E]

It is advisable to use the [V] entry (i.e., to verify the file) when using the [E] option.

3. Form feed insertion

Format [Pn]

This makes it possible to force a form feed (ASCII code 12 or hex 0C) every n lines. It is particularly useful when sending files to the

printer, because it allows the perforations in continuous forms to be skipped to improve legibility. If n is omitted or given as 1, PIP assumes a form feed is required every 60 lines (that is, the default setting). If your paper length is 66 lines per page, use the parameter as follows:

```
A>PIP LST: = REPORT.TXT[P66]
```

Remember that this code is also the 'clear screen' code, so it is advisable to take care when using this option. If this option is used with the [F] parameter, the [F] should come first:

```
A>PIP LST: = REPORT.TXT[FP66]
```

4. Form feed suppression

Format [F]

This is most useful when using PIP with a printer. It suppresses the form feed character (ASCII code 12 or hex 0C) which otherwise would cause the printer to feed a sheet through when it encounters the code.

Example A>PIP TTY: = TEXT.DOC[F]

In conjunction with [Pn] it can be used to change the page lengths by copying a file, removing previously added form feeds and adding them at a different place.

5. Hex format

Format [H]

When this option is specified, data transferred is checked to ensure it is in Intel HEX format. If there is a discrepancy, transfer is terminated.

Example A>PIP DEMO2.HEX = DEMO1.HEX[H]

6. Ignore NULL records

Format [I]

This can be used as an alternative to [H] - it causes PIP to ignore NULL records (hex 00) and ensures the data is in Intel HEX format. It is therefore an extension of the [H] option.

Example A > PIP DEMO2.HEX = DEMO1.HEX[I]

7. Lower case conversion

Format [L]

This option converts all upper case characters to lower case as they are transferred.

Example A > PIP LST: = C:LITTLE.DOC[L]

8. Numbering lines

Format [N]
[N2]

When sending programs to another device it may be useful to have the lines numbered. PIP regards a line as a series of characters terminated by a carriage return (ASCII code 13 or 0D hex). Specifying [N] will begin the file at column 9 of the screen and display the number of the line with a colon(:) in the seventh position followed by a space. For example

C > PIP A: = D:TEST.DOC[N]

```
1: This is line one
2: This is line two
   *
10: This is line ten
   *
100: This is line one hundred
```

Specifying [N2] fills all leading spaces with a zero and replaces the colon with a space.

C > PIP A: = D:TEST.DOC[N2]

```
000001 This is line one
000002 This is line two
      *
000010 This is line ten
      *
000100 This is line one hundred
```

9. Object file transfer

Format [O]

Normally PIP can only copy standard ASCII or HEX files, but using this option allows it to transfer other types of files. Its effect is to ignore the physical end-of-file code a CTRL-Z (ASCII 26 or 1A hex) wherever it occurs in the object file, because in this context it will not be signalling the end of the file.

Example A > PIP B: = OBJECT.FILE[O]

It is not necessary to use this optional parameter with a COM file, because PIP adds it automatically. However, when PIP is used with other machine code or object files which do not have the file extension COM the [O] parameter MUST be used.

10. Read system files

Format [R]

This option makes it possible to read and copy system files, that is, files which do not appear in the directory and those with a file-type of SYS. It automatically sets the [W] option.

Example A > PIP B: = A:.OSTAB.SYS[R]

11. Stop copying at specified string

Format [Qstring^Z]

(^Z indicates CTRL-Z, which is entered by holding down the **CTRL** key and pressing **Z**.)

If you only want to transfer part of a file, this option causes PIP to stop file transfer when it finds the specified string. Only text preceding the string is copied.

Example A>PIP LST:=B:REPORT.DOC[QTHE END^Z]

If you want to search for a string containing lower case characters, start PIP and type the command string following the PIP prompt (*). (CP/M converts everything typed on the command line into uppercase, so lowercase strings cannot be entered from the CP/M command line.)

Example *LST:=B:REPORT.DOC[QThe End^Z]

The [Q] option can be used with the [S] option to copy a section from the middle of a file.

12. Start copying at a specified string

Format [Sstring^Z]

This behaves in much the same way as the [Qstring^Z] option, except that it starts copying from the end of the specified string. The same conditions apply as with the [Q] option if you want to detect lowercase characters.

Example A>PIP CHAPTER1.DOC=CHAPTER1.DOC
[SINTRODUCTION^Z]

The [S] and [Q] options can be used together if you want to copy a section from the middle of a file.

Example *CHAPTER1.DOC=CHAPTER2.DOC
[SIntroduction^ZQlast.^Z]

13. Tab settings

Format [Tn]

Tab settings in the destination file can be changed from those of the original with this option. The number given by n puts tabs settings at columns n, 2n, 3n, and so forth. For instance, [T9] puts tabs settings at columns 9, 19, 29, 39, etc. These settings are used wherever PIP comes across a TAB character in the file it is copying. The TAB character is CTRL-I (ASCII code 9).

If the word processor or whatever created the text file, inserts spaces instead of using the TAB character, this option has no effect.

Example A>PIP CON:=B:PROGRAM.ASM[T10]

14. Transfer between user areas

Format [Gn]

Normally, it is not possible to use files from other than the current user area. However, specifying this option allows transfer of files from user area n to the current area.

Example C>PIP A:TEST.DOC=A:DEMO.DOC[G3]

15. Truncate lines of data

Format [Dn]

This option allows truncation of lines at column n; that is, PIP deletes all characters between column n and the next carriage return.

Example A>PIP LST:=PROGRAM.BAS[D80]

16. Uppercase conversion

Format [U]

This is the opposite of the [L] option; it converts all lowercase characters to uppercase.

Example A>PIP TTY:=BIGTYPE.TXT[U]

17. Verify the copy

Format [V]

Verifying a file as it is copied acts as a double check on its integrity. When given this option PIP compares the copy it has made with the original as it goes along, ensuring a faithful reproduction containing only those errors that were in the original.

Example A>PIP B:=PERFECT.COM[V]

18. Write to a read/only file

Format [W]

If you have files which have been set to read-only with STAT, you can copy over them if you give this option (PIP does not ask if you want the existing file erased and overwritten). It is not possible to reverse the process if you make a mistake; use with care!

Example A>PIP A:=B:SECURE.COM[W]

19. Zero parity setting

Format [Z]

The highest bit of each byte is usually the parity bit, and this option sets all highest-order bits to zero, thus converting 8-bit ASCII bytes to 7-bit ASCII bytes. When using this option make sure that none of the characters sent use this bit because otherwise you could get some strange results. For example, graphics characters and some console ESC codes would be changed.

Example A>PIP C:=B:ORDINARY.FIL[Z]

5.3.6 Using the PIP * prompt

If you want to transfer a large number of files or transfer files between two data disks, it may be more convenient to give the PIP command on its own, producing the * prompt:

The command string can then be typed for each operation. For example to copy all COM files to drive A: from drive C:, use PIP as follows:

```
C>PIP
*A:=C:*.COM
```

```
COPYING
PIP.COM
STAT.COM
CONFIG.COM
*
```

To output a file to the screen:

```
C>PIP
*CON:=MEMO.DOC
```

At the * prompt you can type in any PIP commands you like without having to load PIP for each operation. This can save a great deal of time if there are a number of operations to be carried out.

Once you have finished, pressing the **RETURN** key, or the **STOP** key will return you to the system prompt on the drive from which you entered PIP (the default drive), or to the MENU if it is switched on.

5.4 STAT

The STAT program is used to display the STATistics or STATus of the various disk drives. This makes it one of the most useful utility programs. Many CP/M users do not use the full facilities provided by STAT. The following information is therefore provided as a list of operations, with a summary at the end.

5.4.1 Using the STAT program

1. Change device assignments

Format STAT logical: = physical:

The device assignments can be altered with this command. However, it is more likely that the CONFIG program would be used instead since the devices are named in real terms rather than as codes.

For those who are familiar with the STAT command, the following table shows correspondance between the physical devices and those implemented:

LST:	TTY: Serial (printer)	CRT: Cartridge Printer	LPT: RS-232C (printer)	UL1: not implemented
PUN:	TTY: not implemented	PTP: LCD display	UP1: RS-232C	UP2: not implemented
RDR:	TTY: Keyboard	PTR: not implemented	UR1 RS-232C	UR2: not implemented
CON: Output Input	TTY: RS-232C Keyboard	CRT: LCD Keyboard	BAT: LCD RS-232C	UC1: RS-232C RS-232C

For instance, to tell the computer that the printer is now attached to the serial port instead of the RS232-C port, the command

C>STAT LST: = TTY:

is given, after which all output destined for the printer is sent to the serial port instead of the RS-232C port. Then, if the STAT DEV: command is given, the result will be:

**CON: is CRT:
RDR: is UR1:
PUN: is UP1:
LST: is TTY:**

2. Disk characteristics

Format STAT DSK:

The complete status of a disk is displayed using this command. It shows the status of both the current disk and that of any others that have been accessed during the same session:

This command displays the characteristics of the disks accessed, such as its capacity; for example:

A>C:STAT DSK:

A: Drive characteristics (drive name)
72: 128 Byte Record Capacity (no.of 128 byte records allowed)
9: Kilobyte Drive Capacity (formatted capacity of drive)
16: 32 Byte Directory Entries (no.and size of directory entries)
0: Checked Directory Entries (no.of checked directory entries)
128: Records/Extent (no.of records per extent)
8: Records/Block (no.of records per block)
64: Sectors/Track (no.of sectors per track)
0: Reserved Tracks (no.of tracks reserved for CP/M)

3. Help

Format STAT VAL:

This acts as a sort of HELP command. It shows the formats of the various STAT commands which can be given to obtain information or alter device attributes and assignments:

C>STAT VAL:

Temp R/O Disk: d: = R/O
Set Indicator: d:filename.typ \$R/O \$R/W \$SYS \$DIR
Disk Status: DSK: d:DSK:
User Status: USR:
Iobyte Assign:
CON: = TTY: CRT: BAT: UC1:
RDR: = TTY: PTR: UR1: UR2:
PUN: = TTY: PTP: UP1: UP2:
LST: = TTY: CRT: LPT: UL1:

4. Display device assignments

Format STAT DEV:

This shows which physical devices are assigned to the various logical devices. To check the devices by name, use the CONFIG program.

C>STAT DEV:

CON: is CRT:
RDR: is UR1:
PUN: is UP1:
LST: is LPT:

5. Read/only - protect all the files on a disk

Format STAT drivename: = R/O

An entire disk can be set to read/only with this command. The read/only setting remains effective until either a warm or a cold start

is made:

C>STAT D: = R/O

The Read/Only command protects the files on a disk so that they cannot be erased or written to. If you try to write or erase a file with the R/O attribute, the following error message is displayed:

D>ERA LETTER DOC BDOS ERROR ON A: R/O

Pressing either the **RETURN** key, the **STOP** key, or **CTRL - C** will return you to the prompt.

It is also possible to protect or un-protect single files with STAT.

6. Read/only - protecting a file

Format STAT drivename:filename.filetype \$R/O

Any file can be set to read/only using this format. This prevents the file from being altered until it is reset to read/write:

C>STAT A:DOCUMENT.TXT \$R/O

DOCUMENT.TXT set to R/O

7. Read/write - un-protecting a file

Format STAT drivename:filename.filetype \$R/W

This resets a file to allow it to be written to as well as read.

C>STAT A:DOCUMENT.TXT \$R/W

DOCUMENT.TXT set to R/W

If a file is protected and the whole disk is subsequently protected, the file will still be protected when a warm or cold boot is made to remove protection from the disk.

8. Hide from directory - specified file

Format STAT drivename:filename.filetype \$SYS

It is possible to give a file SYStem status using this command. This effectively removes its name from the directory so it cannot be used by anyone who does not know it exists:

```
C>STAT A:DOCUMENT.TXT $SYS
```

DOCUMENT.TXT set to SYS

If a STATus is carried out on the file when it is set to a SYS file, it shows the filename in brackets

```
C>STAT A:DOCUMENT.TXT
```

Recs	Bytes	Ext	Acc
41	6k	1	R/O A:(STAT.COM)

Bytes Remaining On A: 3k

9. Restore to directory - specified file

Format STAT drivename:filename.filetype \$DIR

This countermands the previous format, resetting the file so that it is displayed in the directory:

```
C>STAT A:DOCUMENT.TXT $DIR
```

DOCUMENT.TXT set to DIR

10. Size and attributes - specified file

Format STAT drivename:filename.filetype

The size and attributes of the specified file are displayed using this command. It gives specific information about the number of records (Recs), number of bytes (Bytes), number of extents (Ext) and read/write status (Acc) of each file on the disk, followed by the total number of unused bytes remaining. A complete file name can be given, or wildcard characters can be used to specify a number of files:

a) Information on a particular file

```
C>STAT A:TESTING.COM
```

Recs	Bytes	Ext	Acc
16	4k	2	R/O A:TESTING.COM

Bytes Remaining On A: 4k

b) Information on all files

```
C>STAT C:*.*
```

Recs	Bytes	Ext	Acc
64	8k	1	R/W C:CONFIG.COM
22	3k	1	R/W C:FILINK.COM
58	8k	1	R/W C:PIP.COM
41	6k	1	R/W C:STAT.COM
10	2k	1	R/W C:SUBMIT.COM
24	3k	1	R/W C:TERM.COM
6	1k	1	R/W C:XSUB.COM

Bytes remaining on C: 33k

c) All files with a particular extension

```
C>STAT A:*.COM
```

Recs	Bytes	Ext	Acc
58	8k	1	R/W A:PIP.COM

Bytes remaining on A: 0k

d) Files containing specific characters

A>STAT D:DEMO??.BAS

Recs	Bytes	Ext	Acc
20	3k	1	R/W D:DEMO1.BAS
16	2k	1	R/O D:DEMO13.BAS
14	2k	1	R/W D:DEMO1A.BAS

Bytes remaining on D: 258k

11. Size and attributes - specified file

Format STAT drivename:filename.filetype \$\$

Using this form of the command will give the same information as without the \$\$ option, but with the addition of the size of the file. This value is the same as the number of records for sequential access files, and is generally used to show the amount of space that has been reserved for a random access file. This is because a sequential file simply takes up space as it is added to, and a random access file has an amount of space allocated to it when it is created:

A>STAT A:DOCUMENT.* \$\$

Size	Recs	Bytes	Ext	Acc
16	6	2k	1	R/W A:DOCUMENT.TXT
6	6	2k	1	R/W A:DOCUMENT.BAS

Bytes remaining on A: 4k

12. Space remaining on disk

Format STAT

This form of the command will display the amount of space available on the current drive and on any other drives which have been accessed during the current session. It also shows the drives' read/write attributes:

a) **C>STAT**

C: R/O Space: 33k

b) **C>STAT**

A: R/W Space: 0k

C: R/O Space: 33k

H: R/W Space: 24k

13. Space remaining on specified disk

Format STAT drivename:

This form of the command gives the amount of space remaining on the specified drive:

C>STAT A:

Bytes Remaining On A: 0k

14. User STATUS

Format STAT USR:

This format is used to display the current USR number and USR numbers under which there are active files on the disk:

A>STAT USR:

Active User: 0

Active Files: 0 1

This indicates that the current USR number is 0 and that USR numbers 0 and 1 both have active files on the disk.

5.4.2 Summary of STAT commands

STAT
SPACE REMAINING ON DISK

STAT DEV:
LOGICAL TO PHYSICAL ASSIGNMENTS

STAT drivename:
SPACE REMAINING ON SPECIFIED DISK

STAT drivename:=R/O
READ/ONLY - SET SPECIFIED DISK

STAT drivename:filename.filetype
SIZE AND ATTRIBUTES - SPECIFIED FILE

STAT drivename:filename.filetype \$DIR
REPLACE IN DIRECTORY - SPECIFIED FILE

STAT drivename:filename.filetype \$R/O
READ/ONLY - SET SPECIFIED FILE

STAT drivename:filename.filetype \$R/W
READ/WRITE - SET SPECIFIED FILE

STAT drivename:filename.filetype \$S
SIZE AND ATTRIBUTES - SPECIFIED FILE

STAT drivename:filename.filetype \$SYS
REMOVE FROM DIRECTORY - SPECIFIED FILE

STAT DSK:
DISK STATUS

STAT logical:=physical:
CHANGE DEVICE ASSIGNMENTS

STAT USR:
USER STATUS

STAT VAL:
HELP

5.5 TERM

The TERM program makes it possible to connect PX-4 to a host computer through the RS-232C interface or direct modem for use as a terminal.

The TERM program can be started by entering the TERM command.

Example: A>C:TERM

When the TERM command is entered, the following screen is displayed.

```
TERM (c) Copyright 1984 by EPSON U1.0
A telecommunication via RS-232C port.

The RS-232C status is :
rate=4800 data=8 stop=2 parity=NONE
xon/xoff=disable si/so=disable

Use CONFIG program to change the status
```

NOTE:

When the direct modem is used, "D-MODEM" is displayed instead of "RS-232C."

Pressing any key changes the display as follows.

```
Send modes of TERM
1 = Normal.
2 = Insert LF after CR.
3 = D--Delete LF after CR. K--Normal.
4 = D,K--Change CR(,LF) for ETX.
   K--Change ^C,STOP for CR.
   D---Disk K--Key Board
Select a mode 1
```

Enter any of 1 to 4 to select a mode, then press the **RETURN** key; PX-4 then enters the terminal mode. Pressing **SHIFT** + **ESC** in the terminal mode displays the following screen so that the current RS-232C status and **PF** key functions can be obtained.

```

*** RS-232C STATUS ***
rate=4800 data=8 stop=2 parity=NONE
xon/xoff=disable si/so=disable

*** PF KEY DISPLAY ***
PF1/6 PF2/7 PF3/8 PF4/9 PF5/10
DISPLAY PRINT SEND RECEIVE exit

```

[PF] key functions other than RECEIVE and exit are displayed in uppercase letters when they are OFF and in reversed uppercase letters when they are ON. “-” indicates that no function is assigned to the key.

Display returns to the former screen when any of the following occurs.

- (1) [SHIFT] + [ESC] is pressed again.
- (2) Any of the valid [PF] keys is pressed.
- (3) A valid key is pressed to input data while keyboard input display is ON.
- (4) Data is received from the RS-232C interface or direct modem.
- (5) An error occurs.

The functions of the [PF] keys are as follows.

PF1: Switches keyboard data display ON or OFF. The function indication alternates as follows.

When ON -- DISPLAY When OFF --

Display can be turned ON or OFF at any time. However, if keyboard input display is set to ON while receiving data, data input from the keyboard cannot be distinguished from that received. The default setting for keyboard data display is OFF.

PF2: Switches printer output ON or OFF. The function indication alternates as follows.

When ON -- PRINT When OFF --

“Send” and “Receive” indications are not displayed when this switch is ON.

This function switches output of receive data to the printer (connected to the parallel printer output connector) ON or OFF. Keyboard input data can be printed only when keyboard data display is ON and printer output is ON. However, output to the printer is inhibited during file data transfer. The printer connected must be equipped with a Centronics interface. The default setting for printer output is OFF.

PF3: Starts sending a file. The “Send” indication is displayed in uppercase letters while data is being sent. The “Print” and “Receive” indications are not displayed. First, TERM prompts for input of a file name. When the file exists, TERM then prompts the operator to enter the interval between characters, that following CR-LF sequences, and that following each 128-byte block. Each interval is set as a multiple (0 to 255) of 20 ms. The default settings for the first two intervals are 0 and that for the third is 175. This interval is required when files transferred are to be saved to a disk in a terminal floppy unit. After the intervals have been entered, TERM outputs the contents of the file to the RS-232C interface or direct modem. When data transfer is completed, the function key indications return to their initial state. File output can be stopped by pressing the [PF3] key.

PF4: Starts receiving data. [SHIFT] + [ESC] is ignored until data transfer is completed. When a file name is entered, a file is created for storing data received. If code 1BH (ESC) is received, it is always converted into code 2EH (period “ . ”) before it is output to the printer. Pressing [PF4] during data transfer closes the file and stops data reception.

PF10: Terminates TERM operation.

HELP: The TERM command outputs the BREAK signal (a start bit with a duration of 200 ms) to the RS-232C interface when the [HELP] key is pressed. (The Break signal is used to interrupt transmission by the other computer.)

The other [PF] keys have no functions.

Errors

When an error or a condition which requires a user decision is detected during TERM operation, a message is displayed. Messages displayed for each error/condition and procedures for handling them are as follows.

(1) RS-232C is not ready.

Cause: An attempt was made to output data to the RS-232C interface without connecting the RS-232C interface cable.

Handling: Connect the RS-232C interface cable, then press **CTRL** + **STOP** to reset the error and start file output.

(2) File not found

Cause: The specified output file does not exist.

Handling: Respecify using the correct file name.

(3) No file name specified

Cause: An attempt was made to send without specifying a file name.

Handling: Specify the file name.

(4) Bad file descriptor

Cause: The file name specified does not conform to the rules for specifying file descriptors.

Handling: Correctly specify the file name.

(5) Drive select error

Cause: A drive name other than A: to K: was specified.

Handling: Specify a drive name from A: to K:.

(6) Overwrite (Y/N) ?

Cause: This message is issued on the receiving side when a file with the specified name already exists.

Handling: Type in Y or N. If Y is input, the existing file is overwritten; if N is input, TERM prompts for specification of another file name.

(7) Communication error Press ESC to restart, STOP to exit from TERM.

Cause: A communication error (framing, buffer overflow, or receive overrun error) occurred, or the sending and receiving computers are not set with the same communication parameters (word length, parity, baud rate, etc.).

Handling: When this message appears, keys other than the following are ignored and the file being transferred must be resent from the beginning.

ESC Restarts the program.
STOP Ends the program.

When this message is displayed because the communication parameters have not been correctly set, end TERM operation and respecify the RS-232C settings with the CONFIG command.

(8) Directory full Press ESC to restart, STOP to exit from TERM.

Cause: The directory space on the disk is full.

Handling: When this message appears, keys other than the following are ignored.

ESC Restarts the program.
STOP Ends the program.

Change to another disk, then start the TERM program again. The file being transferred when the error occurred must be resent from the beginning.

(9) Disk full Press ESC to restart, STOP to exit from TERM.

Cause: There is no free space left on the disk.

Handling: When this message appears, keys other than the following are ignored.

ESC Restarts the program.
STOP Ends the program.

Change to another disk, then start the TERM program again.

(10) File close error

Cause: An error occurred while a file was being closed.

Handling: Change to another disk, then start the TERM program again.