

WORKABOUT PROGRAMMING GUIDE

Version 2.30

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CHAPTER 1

INTRODUCTION TO THE *WORKABOUT*

The *Workabout* has been designed to be integrated into any computer system and to meet any application requirement: assisting with the making of deliveries, taking of orders, collecting or distributing information, servicing equipment, and so on.

Every element of the hardware is configurable, from the plug-in megabyte-sized Solid State Disks, to the internal expansion slot for peripheral devices such as a serial port expansion card.

Equally important is the multi-tasking operating system with full graphics and windowing capability. Applications can make productive use of the various fonts and emphases available, and can even display and manipulate diagrams, maps, and pictures. The result: software applications that are highly informative and intuitive to use, and which consequently improve operator acceptance and efficiency.

The multi-tasking facilities - unique to the Psion ranges of handheld and pocket computers - significantly shorten software development times and greatly simplify otherwise complex issues ranging from the simultaneous monitoring of several peripherals through to sophisticated process control applications.

Additionally the *Workabout* has built-in programming tools for easy application development. These include both a Command Processor and a graphic user interface (the *System Screen*), a sophisticated program editor and translator, and communications software.

Switching on and off

The *Workabout* can be switched on by means of the yellow On/Esc key, or off by means of the light grey Off key near the top left corner of its front face.

There is no need to "exit" programs before switching the *Workabout* off. When the *Workabout* is next switched on, all current programs continue from their previous state. The contents of the internal RAM memory is preserved throughout the period of being switched off, without any significant current being drawn in the meantime.

Switching on for the first time

Note that when a *Workabout* is switched on for the first time (or following a reset), it will go into the *Startup Shell*. This will normally run any *autoexec* file that is found on a *Startup SSD* that is found on any local drive. If such a file is not found, the Startup Shell displays the Psion logo with a copyright message, followed by a startup message, as in the following illustration:



To select a system interface for development purposes, just press the Menu key. The Startup Shell's Special menu is then displayed.



The Special menu presents three options:

- Selecting the *Command processor* option starts the Command Processor. The *Workabout* in due course presents an `M>` prompt to indicate that its Command Processor is ready to receive commands, and that the current drive is M: (internal). See the *Workabout Command Processor* chapter for further details
- Selecting the *System screen* option starts the System Screen, displaying a set of icons that represent the built-in example PIM applications. The description of the use of these applications is beyond the scope of this manual. For information on how to create applications that run from the System Screen, see the *Programming the Workabout* chapter (which relies on information contained in the *Series 3/3a Programming Guide*).
- Selecting the *Restart shell* option runs the Startup Shell again. The machine then repeats the sequence of operations described above. This is only of use if you want to run a customised Startup Shell.

Startup SSD

A Startup SSD must contain a file with the file name *autoexec*. This may be a batch file, with a file name extension of *.btf*, or it may be an executable program file with a file name extension of *.img*, *.app*, *.opo* or *.opa*. If this is what is required, and you have a Startup SSD to hand, (it is not provided by Psion), insert the Startup SSD and press Enter as instructed.

If you have copied an *autoexec* file to M: this will be run on startup, without displaying the startup message described earlier.

The basic hardware

The *Workabout* is a member of the SIBO family of machines. This architecture is designed to minimise the size, weight and power consumption of the computer. In relation to the *Workabout*, the key components of the architecture are:

- A sophisticated power management system that selectively powers subsystems under software control.
- Solid State Disks (SSDs) that provide fast low-power silicon-based mass storage with no moving parts.
- A synchronous serial interface for Psion peripherals running at high speed, and for communications at 19,200 Baud.
- A 16 bit NEC V30H processor, (essentially compatible with 8086 class).
- Hardware protection of the system from aberrant processes (address trapping of out-of-range writes and a watch-dog timer on interrupts being disabled).
- Real-time clock.
- ROM-resident system software.
- Graphics LCD display.

See the *Introduction chapter* of the *PLIB Reference* manual for further information about SIBO computers and the EPOC operating system that they all use.

All aspects of the hardware of the *Workabout* have been designed with the following goals in mind:

- Portability.
- Robustness.
- Splashproof.
- Data security.
- Ease of use.
- Adaptability.
- Long battery life.
- Standards compliance.

Processor

The *Workabout* uses an industry standard 80C86-compatible 16-bit processor, the NEC V30H, running at a clock rate of 7.68MHz.

The *Workabout* also contains a number of proprietary custom chips called *ASICs*, which are responsible for many of its more exclusive features. The principal *ASIC* chips are described in more detail in the *Hardware Reference* manual.

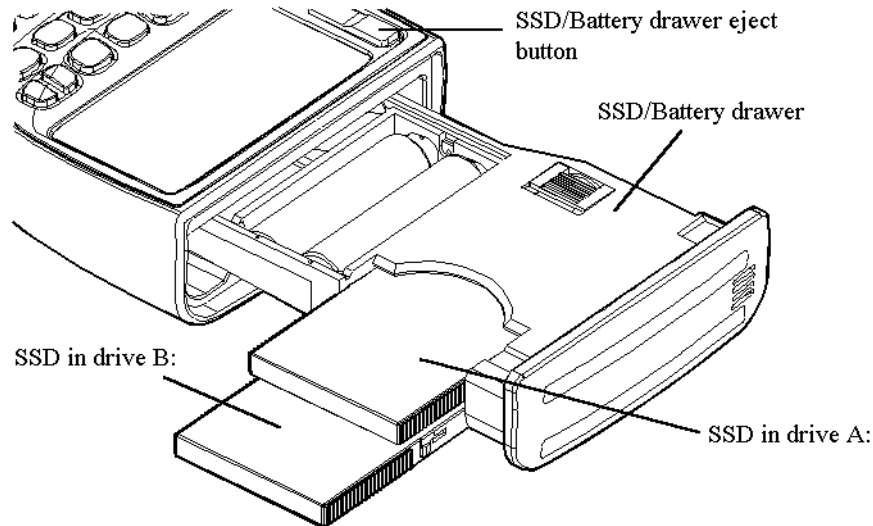
Internal memory

The amount of internal RAM memory on a *Workabout* varies from model to model. There are two basic models, with either 256KB or 1MB.

All models have 1MB internal masked ROM.

Solid state disks (SSDs)

The standard *Workabout* has two solid state disk drives, which are the equivalent of disk drives on a PC. To access them, open the top cover by pressing down the catch to the left side of the *Workabout's* screen. The drawer then slides out of the machine. SSDs can be inserted into the disk drives in the top right and the bottom right of the drawer.



SSDs should be inserted with their upper faces (displaying large writing) uppermost. If you try to insert them upside down, by accident, you will find they don't fit properly into their slots - so there is no risk of any untoward damage, (unless you try to force them).

The SSD drive at the top of the *Workabout* drawer is drive A:, and that at the bottom is drive B:.

See the *SIBO Computers Programmers Reference* manual for further details regarding SSDs.

Expansion slots

There is an expansion slot inside the bottom end of the *Workabout*. This can contain a wide variety of interface devices. Possibilities include:

- RS232/RS232 TTL serial interface.
- RS232/Barcode reader interface (for a wand or CCD/Laser scanner).

Sockets for the ports of these modules, (where fitted), are mounted as standard at the top end of the machine, above the screen. One socket may optionally be located on the left of the bottom end of the casing, below the keyboard.

These are factory fitted options, and it is not possible for the expansion module or port sockets to be exchanged "in the field". Retro-fitting of expansion modules and sockets is possible, however. Contact Psion for further details.

For further details of these modules refer to the *Technical Specifications* appendix of this manual.

Communications ports

On the *Workabout*, the port names (e.g. TTY:A) depend on both the position that the port is located on the machine and the way that the port is being used (e.g. RS232 or TTL):

Port location	Port type			
	RS232	TTL	Inverted TTL	Barcode
Bottom right (LIF)	C			
Top left		D	G	E
Bottom left / top right	A			

Note: future hardware options may be available with different port assignments and positions.

The Holster

A plastic holster is available for storing the *Workabout* when it is not being used. It can be mounted on any convenient vertical surface.

The holster incorporates positive latching to ensure that the *Workabout* is held reliably. A hand recess guarantees easy insertion and removal. It may be mounted in any suitable position.

The *Workabout* Docking Station may also be fitted with the holster and the LIF Converter, (this combination is also known as a *cradle*).

The Workabout Docking Station (Cradle)

The Psion *Workabout* Docking Station (Cradle) has been designed to satisfy requirements for:

- Secure mounting for the *Workabout*.
- "Hands-free" operation.
- Battery recharge.
- Mounting an additional Psion HC type expansion module, such as a printer or modem.

The holster on the *Workabout* Docking Station (where fitted) is as described above.

A separate battery pack slot is provided to allow a stand-alone battery pack to be recharged. The *Workabout* Docking Station also supports a fast recharge facility for the *Workabout* rechargeable battery pack in the charger slot.

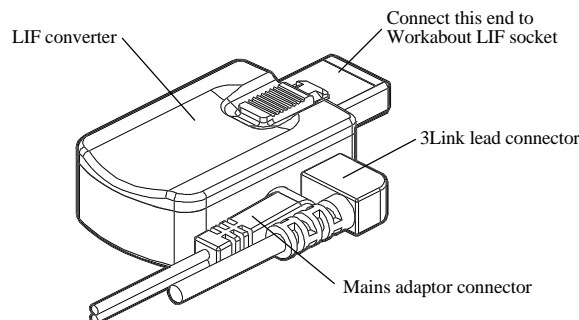
There is a LIF Converter on the Docking Station Cradle, for data exchange and external power to the *Workabout*. It is designed to be connected directly to a *Workabout*. The high reliability contacts of the LIF connector automatically engage when the *Workabout* is placed in the Docking Station cradle - no user-made connections are required. Alternatively an external power **only** LIF plug on a flying lead is supplied with the holsterless version of the Docking Station.

Data may be exchanged at up to 19,200 Baud.

Power supply

The *Workabout* can be powered using a rechargeable nickel-cadmium battery pack, standard AA batteries, or an optional mains adapter.

The *Workabout* will not switch on if there is no power source, or if the batteries are too low. Power is needed to operate the *Workabout* and to maintain the data stored in internal memory. The storage of data on SSDs, however, does not rely on the main power source.

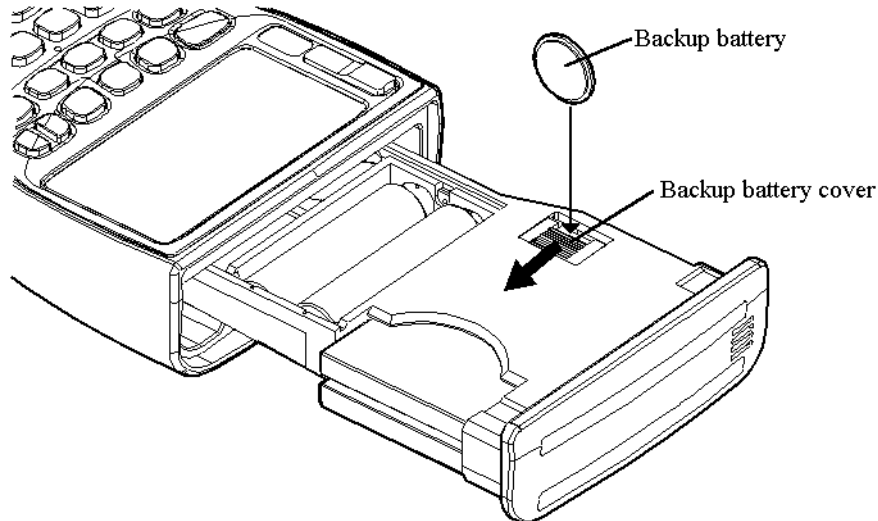


At the bottom of the machine to the right, below the keyboard, is a socket for a LIF converter. To power the *Workabout* from a mains supply, plug the cable from the mains adapter into the LIF converter and then plug the LIF converter into this socket. The green power indicator light (near the Del key) will come on. This light indicates that the *Workabout* is being powered by an external source - even if the *Workabout* itself is not switched on.

The *Workabout* is also supplied with a small round lithium battery. This is the backup battery. It is essential because it keeps the internal memory secure in the absence of the main power source, for example, while the main batteries are being changed. It should be fitted before the main batteries, but note that the *Workabout* can not be run using only the backup battery.

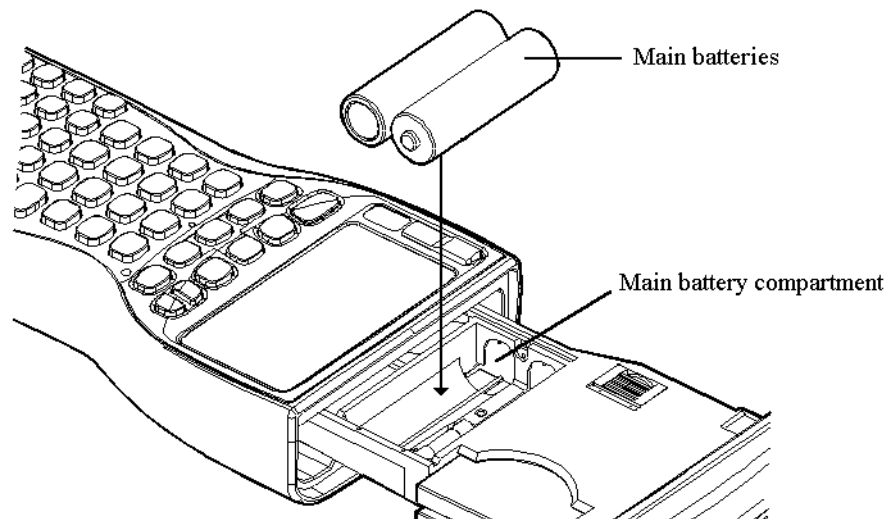
To see where to fit the backup battery, release the drawer at the top of the *Workabout* by pressing down the drawer eject button to the left of the screen (as for SSDs) until it clicks. Pull out the drawer to reveal the backup battery cover in the top of the drawer, towards the left hand side.

The backup battery should last for approximately one year, provided the *Workabout* does not spend long periods with no other power supply. It is recommended that a new backup battery is fitted yearly. If the *Workabout* is left powered only by the backup battery, the battery will preserve the internal memory for approximately five days.



To fit a new backup battery, slide back the backup battery cover and remove the old battery. Insert the new battery so that the positive side of the battery faces left (towards the outer edge of the drawer). Slide back the backup battery cover.

The main batteries are also stored in the drawer of the *Workabout*, next to the two SSD drives. The main battery recess may contain a rechargeable battery cartridge pack. *Do not attempt to disassemble a rechargeable battery pack.*



A new set of alkaline batteries should last for about 80 hours of continuous use. A fully recharged battery pack should last for between 30 and 35 hours. Using the backlight (where fitted), or attached peripherals, will increase power consumption considerably. If left unused, a battery pack will slowly lose its charge over a period of approximately six months.

To remove the rechargeable battery pack or batteries, switch the machine off and release the drawer using the drawer eject button to the left of the screen (as for the backup battery), pull the drawer out until the main battery compartment is revealed, then push and lift any battery pack or AA batteries from the top of the drawer. To fit the rechargeable battery pack or batteries back into the *Workabout*, slide into place, (left end first). Ensure that good connections have been made between the battery terminals and the contacts inside the battery recess, and close the drawer. The machine can now be switched on.

The nickel-cadmium batteries in the battery pack can be recharged in three ways:

- Trickle recharge by a *Workabout* Mains Adaptor (via a LIF converter).
- Trickle recharge by a *Workabout* Docking Station.
- Fast recharge by a *Workabout* Docking Station, provided they are "fast charge" batteries.

A second battery pack can be inserted in the *Workabout* Docking Station at the same time.

The *Workabout* automatically displays a warning message, when switched on, if either the main or backup battery is low. Independently of this, there is a battery information dialog available from any application. This is accessed by pressing the Shift-Ctrl-B key combination. It displays the state of the main and backup batteries, and whether the batteries are alkaline or rechargeable, or whether an external power supply is being used. For correct information ensure that the drawer is securely closed.

When the main battery is low, the *Workabout* may have enough power to display the screen and accept input from the keyboard, but not enough to write to Flash SSD or access expansion devices. The *Workabout* will turn off if an operation is attempted for which it does not have enough power. New batteries should be fitted, (or the existing batteries recharged), before the operation is tried again.

In order to save power, the *Workabout* will, by default, switch itself off automatically, if left alone for five minutes. The "auto-switch-off" time can be changed to another value, if desired, or the *Workabout* set so that it does not auto-switch-off at all.

The fuse

The drawer of the *Workabout* contains a fuse (in the bottom of the battery compartment). This is to generally protect the circuitry of the machine if too much current is being drawn through the batteries. If the computer will not switch on, or has suddenly stopped working, it could be that a fault has caused the fuse to blow. It may be possible to see the melted wire inside the fuse through its glass tube. If the fuse has blown you should contact your Psion service centre.

Note that, if the fuse blows, the backup battery will still preserve the memory of the machine. Furthermore the *Workabout* can still be powered from a mains adaptor via a LIF Converter.

Caution regarding lithium batteries

Note that there is a risk of explosion if lithium batteries are fitted incorrectly. Be sure that the backup battery is fitted so that the face of the battery containing the plus symbol is the one towards the outer edge of the machine. This is the flatter of the two faces.

A Lithium battery should be replaced only with one of the same or equivalent type as the one supplied by Psion. Used lithium batteries should be disposed of according to the manufacturer's instructions. Always tape over the terminals before disposal.

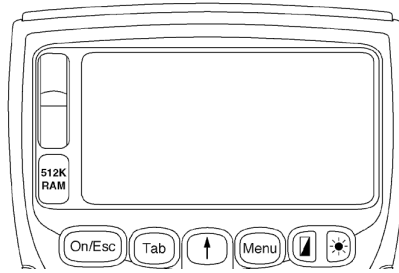
Screen

The normal *Workabout* screen is a retardation film LCD, 62.4mm (2.45 inches) wide by 30mm (1.18 inches) high, displaying 240 pixels horizontally and 100 pixels vertically. The pixel dimensions are 0.27mm by 0.23mm, with a pitch of 0.30mm by 0.26mm.

In the default (proportional) font, the screen displays seven lines, each with around 24 characters. If fewer characters are required to be displayed, a larger font can be used, to achieve a more striking screen image, (and vice versa).

Changing the font is only one example of the graphics support supplied by the resident software.

By default, the screen is illuminated by reflected light, using, (as throughout the *Workabout*), state-of-the-art technology. In case additional lighting is required, some variants (e.g. the 1MKB variant) are provided with a factory-fitted backlight. A backlight may also be retro-fitted to any model. This backlight can be switched on or off whenever the user requires, (bearing in mind that there is an inevitable additional drain on the batteries whenever the backlight is used).



The switch for the backlight has a ☀ symbol on it. In addition, the *Workabout* can be configured to switch off the backlight automatically once a given time period has elapsed.

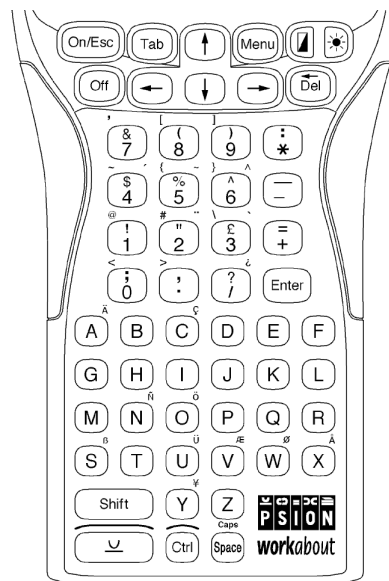
Screen contrast may be adjusted using the contrast key, which has a ▮ symbol on it. Pressing this key on its own makes the background darker. Pressing Shift-Contrast makes the screen background lighter. In both cases the operation cycles round when the adjustment reaches the end of its range.

Keyboard

The keyboard features positive travel rubber keys with durable legends.

Two keyboard layouts are available, depending on how the *Workabout* is to be used:



- The standard full alphanumeric keyboard (57 keys).
- The alphanumeric keyboard can be augmented with special characters used in Scandinavian and Western European countries. These characters can be printed on the key surround as a factory fitted option, (above and to the right of the relevant keys). The extra characters are accessed via the Psion modifier key once the "Special keyboard" has been selected. Note that the following diagram shows these characters, but that they are not present on the key surround of a standard machine.



The following special keys are present:

- | | |
|--------|---|
| On/Esc | Switches the <i>Workabout</i> on, and functions as an Escape key, (used to clear a line of input or cancel an entry). |
| Off | Switches the <i>Workabout</i> off. |
| Menu | The use of this is under <i>application control</i> , i.e. it is not used by any core system code. It may be acted upon by the foreground process, or by any process that captures the keypress including the Command Processor and System Screen. Used to bring up a set of menus. In the Startup Shell it brings up the Special menu that allows you to choose a system interface, or to restart the shell. |

☀ (Backlight) Switches the backlight on and off, (where fitted).

 (Contrast)	Controls the contrast of the LCD display.
Del	Used to edit typing, and to delete items of various kinds, database records, for example.
Enter	Terminates a line of input, exits a dialog, etc.
 (Psion)	An extra modifier key (analogous to Alt on a PC), recognisable by its familiar "cup and saucer" Psion logo.

There are also several special keypress combinations:

Shift-Esc	The "Help" hotkey combination. The use of this is under <i>application control</i> , i.e. it is not used by any core system code. It may be acted upon by the foreground process, or by any process that captures the keypress including the Command Processor and System Screen. It is used to bring up a Help menu. It appears to any application exactly like the Help key on a Psion Series 3a.
Ctrl-Esc	The "Help index" hotkey combination. It is used to bring up a Help index. It appears to any application exactly like the Ctrl-Help key combination on a Psion Series 3a.
Psion-Tab	The "Task" hotkey combination. It allows switching between tasks.
Psion-Space	The "Caps lock" key combination. This is used to switch between normal and "Caps lock" modes. In normal operations lower case characters are the default, with upper case only when the Shift key is held down. In "Caps lock" mode, upper case characters are the default and lower case characters are obtained by holding down the Shift key.
Psion-Left	The "Home" key combination. The use of this is under <i>application control</i> .
Psion-Right	The "End" key combination. The use of this is under <i>application control</i> .
Psion-Up	The "Page Up" key combination. The use of this is under <i>application control</i> .
Psion-Down	The "Page Down" key combination. The use of this is under <i>application control</i> .
Shift-Ctrl-B	The "Battery" hotkey combination. It displays battery information: main battery state and type, backup battery state and whether external power is present. It is available at all times regardless of what application is running, (it is implemented in the Startup Shell). Note: for correct information the drawer must be securely closed.

Buzzer

The *Workabout* contains a piezo buzzer for beeps, key clicks, etc.

The basic software

The software running on a *Workabout* at any one time is a mixture of:

- ROM resident core software (the "operating system").
- ROM resident utilities, such as the MS-DOS like Command Processor, OPL program editor and the LINK communications software.
- ROM resident PIM application software, (the System Screen, database, calculator, spreadsheet and/or communications terminal emulator).
- Application software, from an SSD or internal memory.
- Library software, again from an SSD or internal memory.

Versions of the *Workabout* software

To see which version of ROM software is contained in any *Workabout*, enter `ver` at the `>` prompt in the Command Processor. The *Workabout* ROM version number is given, plus a separate version number for the EPOC operating system, and another one for the *Workabout* System Interface.

ROM components

In addition to those files in the ROM that are common to all SIBO computers, there are several that are unique (or specifically adapted) to the *Workabout*. These include:

<i>sys\$shll.img</i>	The Startup Shell, that displays the Psion logo when the machine is first switched on, or after a reset. It runs any <i>autoexec</i> file, and gives the battery information window.
<i>sys\$cmdp.img</i>	The Command Processor, as described in detail in a separate chapter.
<i>sys\$gsys.img</i>	The System Screen, as described in detail in a separate chapter.
<i>sys\$ctry.cfo</i>	This file holds all the language-dependent text strings used by the operating system, as well as the standard keyboard layout information. It is used in preference to <i>sys\$ctry.int</i> when you select the Standard keyboard option from the Command Processor's Control menu, or enter <code>setdef /k0</code> .
<i>sys\$ctry.int</i>	This file holds all the language-dependent text strings used by the operating system, as well as the special keyboard layout information. It is used in preference to <i>sys\$ctry.cfo</i> when you select the Special keyboard option from the Command Processor's Control menu, or enter <code>setdef /k1</code> .
<i>opl.dyl</i>	Provides the facilities needed to enable programs written in OPL to be run.
<i>opls3.dyl</i>	Provides the facilities needed to enable Psion Series 3 type OPL programs to be run on the <i>Workabout</i> .

The ROM also contains a number of built-in fonts (*.fon files). The *Workabout* fonts are identical to those used in the Series 3a and are described in the *Text fonts* section of the *Introduction* chapter of the *Window Server Reference* manual.

To obtain a listing of all the files in the ROM, enter `dir rom::` at the `>` prompt of the Command Processor. Note, however, that no file corresponding to EPOC itself appears in this listing. EPOC is the kernel of the operating system, and not a file in `rom::`.

Note: The ROM contains the file *sys\$soak.img*. This is a soak test program that is intended for Psion use only. Since this program erases everything in memory, it should not be run.

Command Processor

This application is included in the ROM for the benefit of program developers. It provides a DOS-like command line interface.

In addition to the familiar DOS commands there are several commands peculiar to the *Workabout*. Some provide information, such as `LSEG`. Others invoke features of the *Workabout* which are beyond the scope of DOS, such as `START` which runs processes asynchronously.

This application can also run batch files. It is invoked transparently by the Startup Shell to run *autoexec.btf* if required.

See the *Workabout Command Processor* chapter for further details.

System Screen and PIM applications

The System Screen application is included in the *Workabout* ROM as an example of a GUI application. It is very similar to the Series 3a System Screen.

It provides much of the same functionality as the Command Processor, the major difference being that there is no batch file handling.

Modified versions of the Series 3a personal information management (PIM) applications Data (database), Calc (calculator) and Comms (communications), and of the Series 3 Sheet (spreadsheet) are included by way of examples of the machine's potential. Most of the modifications concern the size of dialog boxes, in that a smaller dialog box font is used when the applications run on a *Workabout*.

Details of the use of the System Screen and the PIM applications are beyond the scope of this SDK. An introduction to their use may be found in the *Workabout User Guide* that is available with *Workabout* machines.

Resetting the Workabout

It is rarely necessary to reset the *Workabout*. Even a serious bug in the application being developed is unlikely to cause the entire *Workabout* system to hang. For example, any illegal attempt by an application to write to data outside its own data segment will cause the operating system to terminate the application in a so-called *panic*. The same thing happens if an application leaves interrupts disabled for too long. In some instances of software failure, however, a reset may prove necessary.

To avoid the possibility of losing any data used by an application, terminate all applications and save any important data to an SSD or a PC before performing a reset.

Note: There are two holes at the top and bottom centre of the keyboard on the Workabout. Neither of these is for a recessed reset switch.

Soft reset

To perform a soft reset, press Psion-Ctrl-Del, (equivalent to Alt-Ctrl-Del on a PC, or pressing the reset switch on a Psion HC or Series 3/3a). You will hear a short warning buzz. The *Workabout* then turns off, abandoning all programs running at the time, without saving any data currently in use by them. The files in the internal memory (M:) will *not* be lost, however.

Hard reset

If, unusually, all the internal memory (including environment variables) is to be erased too, keep the Shift key held down while resetting the machine, i.e. press Psion-Shift-Ctrl-Del. You will hear a short warning buzz. This is known as a *hard* reset. It is essentially equivalent to using:

- the reset switch on a PC
- the reset switch with the ON/OFF key held down on a Psion HC
- the reset switch with the ON/Esc key held down on a Series 3
- the reset switch with the right-hand Shift key held down on a Series 3a.

Cold reset

If neither a soft nor a hard reset work, remove all power and wait a few minutes before restoring power. The machine must then be switched back on. You will hear a short warning buzz. This is called a *cold* reset and will, like a hard reset, also erase the contents of all internal memory.

What happens after a reset

Following a hard or soft reset, or the temporary removal of all power, the *Workabout* displays the Psion logo and startup message, as if switched on for the first time.

Customising the Workabout

This section describes some of the many ways a *Workabout* can be customised, to make it ideally suited to some particular set of needs.

Hardware customisation

A backlight for the screen may be retro-fitted to any model if required.

Simple measures of hardware customisation include alterations to the labels and branding of the *Workabout*, changes to the colour scheme and new keyboard legends. The machine may also be fitted with a lockable battery/SSD drawer. More extensive hardware customisation, such as altering the keyboard layout, are possible.

These measures of customisation are beyond the scope of this manual, which focuses instead on *software customisation*. Contact your distributor if you wish to investigate the possibilities of hardware customisation.

Software customisation

The *Workabout* is designed to facilitate software customisation. Although (unlike the HC) the contents of the ROM can not be reprogrammed, there are a number of ways in which the *Workabout* can run custom application software. These include:

- supplying an autoexec file,
- replacing the Startup Shell,
- replacing the Command Processor,
- replacing the System Screen,
- adding further applications to those that run under the System Screen.

Only the first of these techniques is recommended as a standard way of customising a *Workabout*. Nevertheless, the others are techniques that can be used if there is a particular reason for doing so. They are described in the *Programming the Workabout* chapter.

Connecting to other computers

This section describes standard serial connections between a *Workabout* and another computer, such as a PC or Apple Macintosh. The discussion is limited to describing connection to a PC, but similar considerations apply to connecting with other types of computer.

Any connection between two computers involves a *hardware connection* and a *software connection*.

Hardware connection

Depending on the connectors fitted to the *Workabout*, a standard serial connection can be accomplished in either of two ways:

- a standard serial cable connecting a *Workabout* RS232 socket (where fitted) to a serial port on the other computer.
- a Psion 3Link serial cable connecting a *Workabout*, via a LIF converter, to a serial port on the other computer.

Note: In order for the *Workabout* to recognise the presence or absence of the 3Link cable, the LIF Converter must be disconnected from the *Workabout* before attaching or removing the cable.

Modern PCs have 9-pin sockets on serial ports; older ones have 25-pin sockets. It is common for PCs to have two serial ports, designated COM1 and COM2. If you only have one serial port on your PC, it will be COM1.

Some Psion communications software running on the PC recognises other serial port designations, such as COM3 or COM4. However, to ensure that communications will work in all cases, you should ideally connect the PC end of the cable to COM1 or, if that port is not available, to COM2.

In either case the *Workabout* could be connected to the other computer via a modem and a suitable telephone line connection. The Psion 3Link serial cable is supplied with all the necessary software, and the accompanying documentation explains its use.

A *Workabout* connected to a modem may be used with the Psion 3Fax SSD software (but note that the *Workabout* is not compatible with the Psion 3Fax modem).

Software connection

Communications software must be running on both machines that are connected via a serial cable.

The *Workabout* contains Link software that, in addition to allowing the transfer of serial data, provides access to the filing system of the attached PC, provided that is also running suitable communications software. The Link software can be started on the *Workabout* either by use of the Command Processor's link command, or by selecting the *Remote link* option of the System Screen's *Special* menu. The Link software is described in the *NCP and Link* chapter of the *I/O Devices Reference* manual.

The software on the PC should be Mclink, RCom (Remote Communications), or any other communications software intended for communicating with a Psion computer. The Mclink software is supplied with this SDK and is described in the *Mclink, Mcprint and Slink* chapter of the *Additional System Information* manual. RCom (Remote Communications) software is supplied with the Psion 3Link cable and is described in the accompanying documentation.

CHAPTER 2

WRITING SOFTWARE FOR THE WORKABOUT

At the time of writing, either of two high level languages - C or OPL - may be used to develop application software for the *Workabout*, although further languages are likely to appear in the future.

The use of OPL is described in the OPL Software Development Kit: this manual, not unnaturally, concentrates on development in C.

Basic programming choices

Standard C (CLIB) or Psion C (PLIB)

As with all SIBO machines, a significant proportion of C code that has already been written for other target computers can be transferred almost straightaway to run on a *Workabout*. The availability of the CLIB standard C library means that all that is required is to recompile and re-link the code.

To take a very simple example, the program *simple.c*

```
#include <stdio.h>

int main(void)
{
    puts("Hello world");
    getchar();
    return(0);
}
```

together with a project file *simple.pr*

```
#system epoc img
#model small jpi
#compile simple.c
#link simple
```

will run on a *Workabout* without any difficulty whatsoever (see the chapter *Building an Application* in the *General Programming Manual* for further discussion of TopSpeed *.pr* project files and their usage).

However, it is recommended that *Workabout* developers rewrite the above program to use the Psion-specific PLIB library, as follows:

```
#include <p_std.h>
#include <p_sys.h>

int main(void)
{
    p_puts("Hello world");
    p_getch();
    return(0);
}
```

with the project file changed to:

```
#system epoc img
#set epocinit=iplib
#model small jpi
#compile simple.c
#link simple
```

The relative merits of CLIB and PLIB are described in the *Building an Application* chapter of the *General Programming Manual* and the *Introduction* chapter of the *PLIB Reference* manual, and will not be further discussed here.

Since the use of PLIB functions is essential for accessing many of the built-in software features - the enhanced graphics facilities of the Window Server, for example - the remainder of this chapter is biased towards PLIB.

Writing the user interface

A SIBO interface can be written in one of the following ways:

- Using console service functions such as `p_printf`, `p_get1`, and `p_puts` (or their CLIB equivalents). These functions can only produce simple row and column text-based output, but can be extremely useful when debugging an application.
- Using functions in the Window Server library with the contents of each window backed up with a bitmap. This method is capable of producing a high quality graphical display, but can be expensive in terms of memory usage.
- Using functions in the Window Server library with the contents of each window explicitly redrawn. This method is also capable of creating a high quality graphical display. Furthermore, it is more efficient than the use of bitmap backups, both in terms of memory usage and speed of drawing.

If following either of the last two of these options, you have a further choice of approaches as follows:

- Make direct use of PLIB and Window Server library functions only. This approach gives you the freedom to implement any form of user interface. However, development of any but a simple interface may require a significantly increased programming effort compared with the following two approaches.
- Combine PLIB and Window Server calls with the HWIF library. This approach to application development, which uses standard C programming techniques, is described in the *Programming in Hwif* manual. It provides access, with some restrictions, to the elements of the built-in user interface that is used for the applications that run under the System Screen.
- Use object oriented programming techniques, combining PLIB and Window Server calls with use of the built-in OLIB, FORM, HWIM and XADD libraries. This approach (referred to in this SDK as *HWIM programming*) allows full access to the elements of the built-in user interface, at the cost of an increased learning curve. See the *Object Oriented Programming Guide* for a description of the relevant techniques.

These three approaches can, to some extent, be combined. It is, for example, permissible for programs developed predominantly using either of the first two approaches to make object oriented accesses to the OLIB library, which does not have any dependency on the choice of user interface.

Synchronous or asynchronous processing

There is a class of programs in which all input to a program comes via the keyboard. These programs can be schematised as follows:

```
Initialise();
FOREVER
{
    ReadKeyFromKeyboard();
    ProcessKey();
}
```

Whilst waiting for a key from the keyboard, the program "hangs", i.e. it is unresponsive to other sources of input. In this case the hanging of the program does not matter, as there are no other sources of input.

The call `ReadKeyFromKeyboard` makes what is known as a *synchronous* read for a key; it is synchronous because it does not return until the keypress it is waiting for has been delivered: the return of the call making the request is automatically *synchronised* with the delivery of the keypress.

Consider another example of *synchronous* i/o. In this case, a program that is printing data might be structured (at least in part) as follows:

```
Initialise();
FOREVER
{
  PrepareLineToPrint();
  SendLineToPrinter();
}
```

This program loop terminates when there is nothing left to print. Now the process of sending a line of data to the printer might take some time. Furthermore, the printer's buffer could be full, in which case the program would have to wait for the buffer to empty a bit before being able to transmit the next line for printing. If the call `SendLineToPrinter` is implemented synchronously, the program will "hang" in this call until the data had been transmitted to the printer. In this state, the program is, again, unresponsive to other sources of input.

A printing program could, and should, allow the user to terminate the printing while it is in progress by simply pressing a predefined key. This means that the program must remain responsive to keypresses even while data is waiting to be sent to the printer. Such a modification requires the *synchronous* call `SendLineToPrinter` to become *asynchronous*.

The software on all SIBO machines has been explicitly designed to address these issues. For all but the simplest of programs the concept of *asynchronous* events is central to successful programming on the *Workabout*, and application developers are strongly urged to face up to this issue squarely, from the beginning. Example programs in the *Fundamental Programming Guidelines* chapter of the *General Programming Manual* cover the necessary concepts in a thorough yet straightforward manner.

Customisation options

The *Workabout* is designed to facilitate software customisation. Although (unlike the HC) the contents of the ROM can not be reprogrammed, there are a number of ways in which the *Workabout* can run custom application software. These include:

- replacing the Startup Shell,
- replacing the Command Processor,
- replacing the System Screen,
- adding further applications to those that run under the System Screen,
- supplying an autoexec file.

Only the last of these techniques is recommended as a standard way of customising a *Workabout*. Nevertheless, the others are techniques that can be used if there is a particular reason for doing so.

Replacing the Startup Shell

When the *Workabout* is first switched on (or following a reset), the Window Server `sys$wsrv.img` looks for and runs a program called `sys$shll.img`. It looks for this program in the root directory of all local drives, scanning them in alphabetical order, and finally in the ROM. Note that this is not the same search order as is used to locate program files that are executed from the Command Processor.

The Window Server also looks for a program of this name, along the same path, whenever the Startup Shell terminates - either normally or abnormally - so as never to leave the *Workabout* without a version of `sys$shll.img` running on it.

The program started in this way is called the *Startup Shell*. The built-in version is the program that, on start-up, looks for and runs any autoexec file or, if no such file is found, presents the Psion logo.

The Startup Shell program in the ROM can clearly be replaced by one on an SSD. There is, however, only a very small RAM overhead involved in having the standard *Workabout* Startup Shell installed and, unless an application needs as much available RAM as possible, there is little advantage in replacing it. It may be of interest to note that this technique is, in fact, used by Psion during factory testing.

During development and initial testing, a replacement Startup Shell should be given another name, such as `workshll.img`, and only renamed to `sys$shll.img` when you are sure that it is free of serious bugs.

If a replacement Startup Shell is on an SSD, you can revert to the built-in version simply by removing the SSD and performing a soft reset. This will preserve any data in the machine's RAM. With a replacement startup shell on the M: internal drive, the only way to revert to the built-in Startup Shell is to perform a hard reset, or to remove all power from the machine - including the backup battery. This will also erase any other data held in RAM.

Replacing the Command Processor

The ROM Command Processor is provided for *development* work, supporting a rich variety of file management, task management, system configuration, and batch file processing commands. However, this functionality brings its own cost in RAM consumption that may well be undesirable for a *Workabout* running application software. For this reason the Command Processor is not loaded into RAM when the *Workabout* is first switched on.

The Startup Shell on the *Workabout*, *sys\$shll.img*, looks for a program called *sys\$cmdp.img* if the *Command processor* menu option is selected from the System Interface selection dialog, or if the Command Processor needs to be loaded to execute a batch file. In either case it looks for the file in the root directory and then the *\img* directory of drive A:, and then in each of the other local drives (including M:). The drives are scanned in alphabetical order. If the file is not found in any local drive, the search concludes by looking in the ROM. The Command Processor program in the ROM can thus be over-ridden by one in any local drive. (Note that the search order is not the same as that used to locate program files that are executed from the Command Processor.)

If a replacement Command Processor is on an SSD, you can revert to the built-in version simply by removing the SSD at a time when the Command Processor is not running. If the replacement is on the M: internal drive, reverting to the built-in version may be less easy. If the replacement Command Processor allows you to exit, you can do so and then rename or delete it from, say, the System Screen. Otherwise, the only option may be to perform a hard reset.

One possible use of a custom Command Processor file is to discourage "hackers". Minimal custom System Interfaces could be provided on the same SSD as the *autoexec* file, and could even be copied automatically onto the internal drive. These custom System Interfaces would merely notify the user that their chosen option was not allowed and return them to their application program or to the Startup Shell.

Replacing the System Screen

The built-in System Screen and the applications that run under it are provided mainly to illustrate some of the possibilities for custom applications, but they may also be useful for *development* work.

The Startup Shell on the *Workabout*, *sys\$shll.img*, looks for a program called *sys\$gsys.img* if the *System screen* menu option is selected from the System Interface selection dialog. It looks for the file in the root directory and then the *\img* directory of drive A:, and then in each of the other local drives (including M:). The drives are scanned in alphabetical order. If the file is not found in any local drive, the search concludes by looking in the ROM. The System Screen program in the ROM can thus be over-ridden by one in any local drive. (Note that the search order is not the same as that used to locate program files that are executed from the Command Processor.)

If a replacement System Screen is on an SSD, you can revert to the built-in version simply by removing the SSD at a time when the System Screen is not running. If the replacement is on the M: internal drive, reverting to the built-in version may be less easy. If the replacement System Screen allows you to exit, you can do so and then rename or delete it from, say, the Command Processor. Otherwise, the only option may be to perform a hard reset.

As with the Command Processor, one possible use of a custom System Screen file is to discourage "hackers". Minimal custom System Interfaces could be provided on the same SSD as the *autoexec* file, and could even be copied automatically onto the internal drive. These custom System Interfaces would merely notify the user that their chosen option was not allowed and return them to their application program or to the Startup Shell.

Adding System Screen applications

Strictly speaking, this technique should not be termed *customisation*, but is included for the sake of completeness.

It is not a viable option for the vast majority of end-user machines, but can be a useful aid to development work. The following types of file, copied to any local drive, can be run under the System Screen:

- application programs, written in C, with a *.app* extension and located in a *\app* directory (directly installable from the Install option of the System Screen's Apps menu)

- image files, written in C, with a *.img* extension and located in a *\img* directory (run from the RunImg icon that can be installed by means of the Install standard option of the System Screen's Apps menu)
- translated OPL applications, with a *.opa* extension and located in a *\opa* directory (directly installable from the Install option of the System Screen's Apps menu)
- translated OPL programs, with a *.opo* extension and located in a *\opo* directory (run from the RunOpl icon that can be installed by means of the Install standard option of the System Screen's Apps menu)

Any such program written for the Series 3 will run without modification on the *Workabout*.

In principle, Series 3a programs should also run on the *Workabout*. In practice, Series 3a programs may need some degree of modification to ensure, for example, that any dialogs and command menus will fit on the *Workabout's* screen.

See the *Series 3/3a Programming Guide* for information on writing applications to run under the System Screen.

Supplying an autoexec file

Most end-user machines will run customised application software via the built-in autoexec mechanism, by which the Startup Shell will search for and run a file with the file name *autoexec* and an extension that is one of: *.img*, *.app*, *.opo*, *.opa*, or *.btf*.

The Startup Shell first searches for a file with the name *autoexec.img* in the root directory and then in a *\img* subdirectory of drive A: The search for this file continues in all other local drives, taken in alphabetic order, that is, in B:, C: (if it is present) and M:. The Startup Shell does not look for *autoexec.img* in the ROM.

If such a file is not found, the Startup Shell searches for other autoexec files in the following order:

- an *autoexec.app* file in the root directory and a *\app* subdirectory
- an *autoexec.opo* file in the root directory and a *\opo* subdirectory
- an *autoexec.opa* file in the root directory and a *\app* subdirectory
- an *autoexec.btf* file in the root directory and a *\btf* subdirectory

In each case all local drives are searched in alphabetic order, as described for the search for *autoexec.img*.

If an autoexec file is written in OPL (that is, it has an extension of either *.opo* or *.opa*) its execution requires the OPL runtime software provided by the file *sys\$prgo.img*. The search for this file looks in the root and *\img* directories of all local drives (again in alphabetic order) and finally in the ROM. This search order allows the built-in *sys\$prgo.img* to be replaced, if required.

If the autoexec file is a batch file (that is, with extension *.btf*) the Startup Shell will need to locate and run the Command Processor, whose file name is *sys\$cmdp.img*, to interpret the batch file. The search for this file looks in the root and *\img* directories of all local drives (again in alphabetic order) and finally in the ROM. This search order allows the built-in *sys\$cmdp.img* to be replaced, if required.

No command line parameters are passed to any autoexec file that is run by means of this mechanism. In practice, many *.app* or *.img* application programs may require command line data, such as the name of a data file to open. In such a case, the solution is to use a short *autoexec.btf* batch file that starts the main application program, passing it such command line data as may be needed.

A further use for such an auxiliary autoexec batch file is to provide a convenient way to make any necessary alterations to the default machine settings before running an application. The following example batch file *autoexec.btf* illustrates both of these uses:

```
REM   Set 24 hour clock and Summer Time ON
SETDEF /t24 /ts+
REM   Run the MY_APP.IMG program, passing two command line parameters
START my_app my_file my_param
```

Note that the program is started asynchronously, by means of the `START` command. The advantage of doing this is that execution of the batch file continues to its termination once the program has been started. On termination of the batch file, the Command Processor will automatically be unloaded, thereby releasing as much memory as possible for use by the main program.

An *autoexec.btf* batch file must not require any intervention from the user. It must not, for example, contain any `PAUSE` commands. Any other command that may require confirmation from the user, such as `DEL`, must be used in the form (e.g. `DEL /Y`) that requires no such confirmation.

See the *Workabout Command Processor* chapter for further information about writing batch files and using Command Processor commands.

Programming guidelines

Because of the close similarity between their operating systems and the built-in software libraries, programming for the *Workabout* is very similar to programming for the Series 3 and Series 3a. The information in this section concentrates largely on the more significant differences. Although of interest to all *Workabout* developers, some of the topics will be of particular significance to those who are already familiar with developing applications for the Series 3 and/or Series 3a.

As has been mentioned earlier, programs written for the Series 3 or the Series 3a can, in principle, be run without modification on the *Workabout*, whether they are written using `CLIB`, `PLIB`, the `HWIF` library or the `HWIM` object oriented user interface. In practice, Series 3a programs may need some modification because of the smaller screen size on the *Workabout*. In `HWIF` or `HWIM` programs, menu bars, pull-down menus and dialogs may all need to be reorganised to occupy less space. Note, however, that the *Workabout* permits dialogs to be displayed in a small font (this is supported for both `HWIF` and `HWIM` programming) and this may eliminate the need to otherwise modify the dialog contents.

One further point that may cause unexpected behaviour in an application transferred from, say, the Series 3 is the presence of additional keys, such as the Backlight key, on the *Workabout* keyboard. It is worth a careful check of the list of special keys, given in the *Events* chapter of the *Window Server Reference* manual, for differences in the various keypresses that are passed to an application running on different machines.

Some consequences of not running under the System Screen

All application software on the Series 3 and Series 3a is run from the System Screen (see the *Series 3/3a Programming Guide*) whereas on the *Workabout* it is not. With the possible exception of software used during the development process, *Workabout* application software is normally run by means of the *autoexec* mechanism, either directly or via an *autoexec.btf* batch file, as described earlier in this chapter. In this respect, programming for the *Workabout* has much in common with programming for the HC (but with the additional possibilities arising from the availability of grey when writing to the display and of the graphical user interface services provided by the built-in object libraries).

Workabout applications that do not run under the System Screen have no need for the icon and shell data files that are built into each Series 3/3a application (usually with a *.app* extension) that can be directly installed under the System Screen. These files contain information specifically for the use of the System Screen, when installing and launching the application. See the *Add-files* section later in this chapter for more information on the files that may be built into a *Workabout* application.

Applications that are not run under the System Screen obviously will not receive System Screen messages. One of the uses of such messages is to inform a Series 3/3a file-based application, while it is running, to open or create a different file. By default on the *Workabout*, information about which file to use can only be passed on start-up of the application, in the command line.

In an `HWIM` application, command line processing is provided by the `am_init` method of the application's instance of (a subclass of) `HWIMMAN`. This processing is based on the assumption that the data in the command line is of the form supplied by the System Screen - as described in the *Series 3/3a Programming Guide*. If the application uses a different format for command line data, it will have to supply its own code to process that data. As for all applications running under `EPOC`, the command line data - with a leading count byte - is pointed to by the magic static `DatCommandPtr`.

Data integrity

Compared with those written for some other SIBO machines, a *Workabout* application is likely to be more critically dependent on access to data, stored either in RAM or in files.

Failure to access or to write data because the battery is too exhausted is likely to be disastrous if the user is away from a source of replacement power source. To some extent, this problem can be avoided by establishing a policy of regular battery replacement. In addition, the system software performs battery status checks each time the machine is switched on and will give the appropriate warning message if either the main or backup batteries need replacing.

In some cases it may, however, be worth considering building regular battery status checks into the application software and giving the user application-specific warnings. Comprehensive information on battery status can be found by use of the PLIB functions, such as `p_supply` and `p_supplyinfo`, that are described in the *Power supply* section of the *General System Services* chapter of the *PLIB Reference* manual.

Another potential source of problems is if a user opens the drawer, say, to change an SSD or to replace the batteries, and does not subsequently close it. In such a case, not only is the data on the SSDs inaccessible, but the *Workabout* is then susceptible to the ingress of dirt and moisture. If such a situation is possible, and is of concern, the application should make explicit checks at appropriate intervals.

It is not possible to check for an open drawer by means of a call to the PLIB function `p_locchg`, since EPOC only registers the change that is reported by this function at the time that the drawer is subsequently closed. Suitable methods of detecting an open drawer would be to attempt to access an SSD file that is known to exist, or to call `p_dinfo` for drives A: and/or B:.

Add-files

Any executable that is built to run on the *Workabout* may have up to four additional files, known as *add-files*, embedded within it. These files are combined with the main file by *emake.exe*, at the time the *.img* file is created. The inclusion of these files is controlled by the presence or absence of an add-file list (*.afl*) file with the same name as the *.img* file that is being created. See the *Building an Application* chapter in the *General Programming Manual* for further general information about add-files.

The add-file list (*.afl*) file is a plain text file, containing a list of up to four files that are to be embedded in the executable. An application that is to run under the system screen will generally have three embedded files: an icon, a resource file and a shell data file. Consider, for example, such an application, named *myapp.app* (by convention, a *.img* file containing add-files is renamed to have a *.app* extension). An appropriate add-file list file would be named *myapp.afl* and could have the following content:

```
myapp.pic
myapp.rsc
myapp.shd
```

The first and last of these three files are used by the System Screen when installing and running the application. In Series 3 and Series 3a applications, the icon may also be displayed in an application's status window, but the *Workabout* status window, however, never displays an application's icon. For further details of the icon and shell data files, see the *Series 3/3a Programming Guide*.

In principle, the four possible add-files may be used for any application-specific purpose. An application for the *Workabout* will, in general, not be run from the System Screen and will therefore not need to contain embedded icon and shell data files. The application may, however, need to use a resource file and, although not mandatory, it is recommended that this file be embedded in the application.

If the application contains an embedded resource file, and if the resource file is accessed via the OLIB `RSCFILE` class, then the resource file must be embedded as the *second* add-file. This will almost certainly be the case for any application developed with the aid of the HWIM library. Such an application must have a resource file and will normally take advantage of the option for the `HWIMMAN` application manager automatically to create an instance of `RSCFILE`. If there is no need for any other embedded files, a dummy file, preferably of zero length, must be created and included as the first embedded file, to ensure that the resource file occupies the second slot.

No access to WLD: or ALM:

The services required by the `WLD:` device driver are supplied by the World application that is built into the Series 3 and Series 3a ROMs, but is not present on the *Workabout*.

Similarly, it is the Time application on the Series 3 and Series 3a that provides the services required by the `ALM:` device driver. Again, this application is not supplied on the *Workabout*.

In consequence, any application using either of these device drivers will fail if run on the *Workabout*.

Programming examples

The vast majority of the examples that are supplied with this SDK are suitable for use on the *Workabout*. The Console examples (that is, those that use only the simple PLIB I/O functions for writing to the screen) are largely machine-independent and will run without modification. Most of the example applications that use either the HWIF or HWIM libraries will also run on the *Workabout*, unless they depend on, say, the wider screen of the Series 3a, or make use of facilities (such as the Series 3a's additional sound services) that are not available on the *Workabout*.

The `\sibosdk\wkdemo` directory that can be installed from the Optional disk contains two examples, one written using HWIF and the other being an object oriented HWIM application.

The Tables application

The HWIF example is a modified version of the Tables program that is described in the *Worked Examples in Hwif* chapter of the *Programming in Hwif* manual. The unmodified version of Tables will, of course, run on the *Workabout* in compatibility mode, using a 240 x 80 region, centred vertically.

Amongst other things, the *Workabout* version illustrates the modest number of changes that are, in general, necessary to convert a 'standard' Hwif application into one that is customised for running on the *Workabout*. Since the Tables program is described in some detail in the *Programming in Hwif* manual, the description here will concentrate on the changes that have been made.

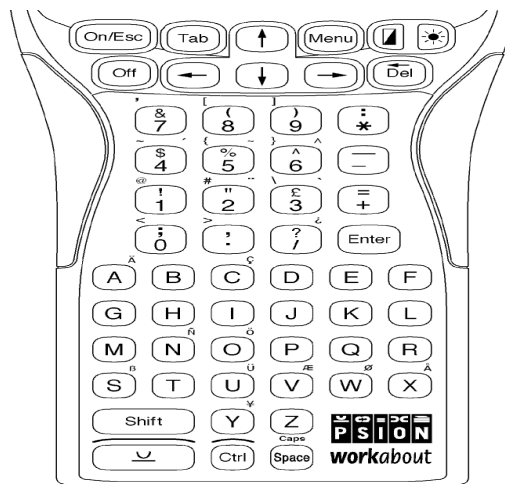
Apart from the project file, `tables.pr`, the entire source of the *Workabout* version of the application is contained in the single file `tables.c`. The application does not use a resource file and, if it is not run from the System Screen, it needs neither an icon (`.pic`) file nor a shell data (`.shd`) file. The *Workabout* version therefore does not need the `tables.afl` add-file list, nor any of the files that it lists. Note that, in the original HWIF version, the file `tables.rsc` is a zero-length dummy file, whose sole purpose is to ensure that `tables.shd` is added in the third add-files slot.

The first modification is to switch out of Series 3 compatibility mode by setting the value of the variable `_UseFullScreen` to a non-zero value:

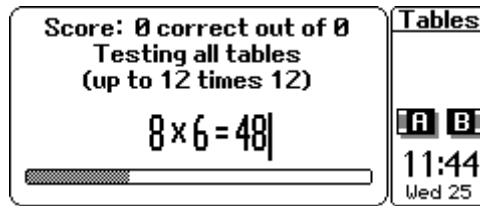
```
GLREF_D UWORD _UseFullScreen;

GLDEF_C VOID main(VOID)
{
    _UseFullScreen=TRUE;
    uCommonInit();
    SpecificInit();
    MainLoop();
}
```

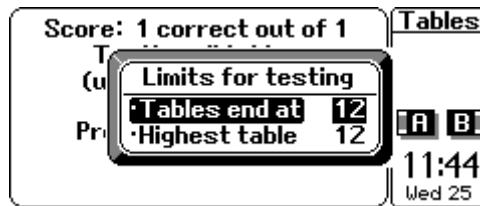
In consequence, the application will occupy all 100 lines of the screen and the height of the main window, in `ReduceScreenSize`, is changed from 80 to 100 pixels. Note that the use of a status window is maintained. This avoids changing the width of the window, which would otherwise introduce a large number of trivial changes to the code in terms of the horizontal positioning of the window contents. The status window on the *Workabout* does not show an application's icon, even if one is built into the application. When first started, the application has the appearance as shown below.



The vertical positioning of all the window's content is adjusted, not only because of the increased height of the window, but also because by default the *Workabout* uses an 11 point font (with font ID `WS_FONT_BASE+9`) whereas an 8 point font (with font ID `WS_FONT_BASE`) is used when running in Series 3 compatibility mode. The larger font is also needed when creating the edit box, in `CreateEditor`, that is used to receive the answer, as illustrated below.



The code to create all but one of the dialogs of the original HWIF version remains unchanged, although their appearance changes since they make use of grey in the dialog border. The following illustration shows the Limits dialog.



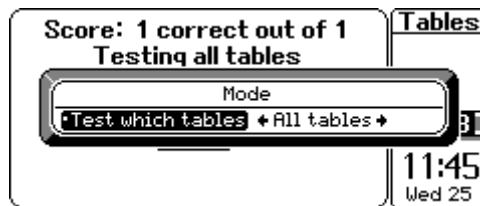
The dialog presented by selecting the Mode option, which selects whether to present tests on a particular multiplication table, or on all tables, is just too wide to be displayed in the normal font. This dialog is therefore set to use a smaller font:

```
GLREF_D UWORD _SmallFontDialog;

LOCAL_C VOID ChangeMode(VOID)
{
    H_DI_CHOICE ch;
    INT j;
    TEXT buf[20];

    _SmallFontDialog=TRUE;
    if (uOpenDialog("Mode"))
        return;
    ...
}
```

The resulting appearance of the dialog is as follows:



The application can be built in the normal way, by typing:

```
make tables
```

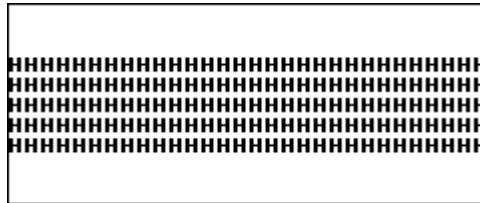
The easiest way of running it is to copy `tables.img` into a `\img` directory on the *Workabout* and then, from the *Workabout's* Command processor, typing:

```
tables
```

The Lcdtest application

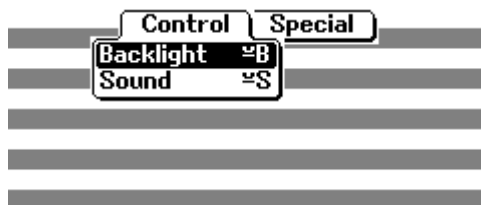
The Lcdtest example is an HWIM application, using the object oriented techniques that are described in the *Object Oriented Programming Guide*.

The application was written to test drawing to the Workabout's screen. It displays a variety of patterns, occupying every pixel. When first started, the application presents the display shown below.

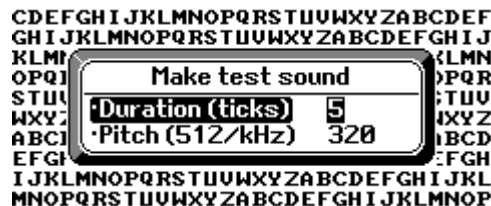


The numeric keys, from 1 to 6 inclusive, switch to alternative display patterns, and pressing the 0 key inverts the current display pattern.

The application has a small menu bar, with Control and Special menus. The Special menu offers an Exit option and the Control menu has options to test the backlight (assuming that it is fitted) and to test sound output.



The dialog presented by selecting the Sound option is shown below.



The Lcdtest application is built by typing:

```
make lcdtest
```

Note that, since this application has a resource file that is read by means of an instance of the OLIB RSCFILE class, the resource file is built into the application, in the second add-file slot. This requires an add-file list, *lcdtest.afl*, to be supplied, with contents:

```
dummy.pic
lcdtest.rzc
```

The file *dummy.pic* is of zero length, and is used to ensure that the (Huffman compressed) resource file is built into the second add-file slot.

Workabout specific environment variables

The following environment variables are used only on Workabout machines.

\$\$SVER

Contains a text string representing the Workabout System Screen version number, for example, "1.00F".

C\$P@

This environment variable is set when exiting from the Workabout command processor. It contains a single ASCII character representing the current drive, with a default value of 'M'.

C\$PA to C\$PZ

The environment variable C\$PA may be set when exiting from the *Workabout* command processor, to contain a text string representing the current path on drive A. It is not set if the drive A path is to the root directory.

Similar environment variables may be set for all other possible drives - C\$PB to C\$PZ inclusive.

C\$PE

This environment variable contains the parameters used by Link when accessed from the *Workabout* System Screen and/or Command Processor.

C\$P\$

This environment variable is set following selection of the keyboard from the Command Processor or the System Screen. It contains a single byte whose binary value is either 0 (Standard keyboard selected) or 1 (Special keyboard selected).

CHAPTER 3

THE WORKABOUT COMMAND PROCESSOR

The *Workabout* Command Processor System Interface is started by selecting the "Command processor" option from the Startup Shell's command menu.

Commands can then be entered by typing at the Command Processor, in response to a > prompt. Instead of commands being entered one at a time, *batch files* can be invoked, to run a series of commands consecutively - or simply to cut down on typing. For example, typing:

```
xbat
```

is shorthand for invoking all the commands stored in the file *xbat.btf*. Note that batch files must have the extension of *.btf*.

The *Workabout* Command Processor provides an DOS-like utility for functions that can be executed from a command line. In addition to the familiar DOS commands there are several commands peculiar to the *Workabout*. Some provide information, such as *LSEG*, which lists the memory segments used by a process. Others invoke features of the *Workabout* which are beyond the scope of DOS, such as *START*, which runs processes asynchronously. The range of functionality covered includes file and SSD management, program management, information requests, and *Workabout* configuration.

Although use of the *Workabout* Command Processor is similar to the way you would use the DOS command line, there are several important differences. For example:

- Relative paths, such as `..*.*`, are not supported and the `*` wildcard in a file name is handled in a slightly different way from the way it is handled in DOS.
- In the *Workabout* Command Processor, environment variable names are case-sensitive. In addition, the content of an environment variable is not restricted to text, and may include binary data.

The differences are explained in the later sections of this chapter.

Two features are available in the *Workabout* Command Processor, but not in the DOS command line.

- A small set of menu options can be accessed by pressing the Menu key. These are described in the *Command Processor menus* section of this chapter.
- At the command line prompt, pressing Shift-Esc brings up a Help menu; pressing Ctrl-Shift-Esc brings up a Help index.

Command Processor menus

If the Menu key is pressed at any time when using the *Workabout* Command Processor, then a menu bar with three menus is presented. The options in these menus are mainly concerned with setting parameters and states that have a global effect. For the default machine settings, see the *SETDEF* command in the *Alphabetical listing* section, later in this chapter.

Each menu option may be accessed using an accelerator key combination that is shown in the menu, adjacent to the corresponding option. The available options and their corresponding accelerators are listed below.

Time menu

Time and date	[Psion-T]	Set the system time and date, (see Formats)
Summer time	[Shift-Psion-S]	Set summer time On or Off
Formats	[Psion-F]	Set date to be displayed in one of three formats: Day month year Year month day Month day year Set the date separator to any non-alphanumeric character. Set the time format to either am-pm or 24 hour. Set the time separator to any non-alphanumeric character. Set the "start of week" day to any day of the week from Monday to Sunday. The default is Monday.

Control menu

Sound	[Psion-S]	Set all sounds to be On or Off. Set beeps to be Loud, Quiet or Off. Set keyclicks to be Loud, Quiet or Off.
Auto switch off	[Psion-A]	Set auto switch off of the machine to Yes or No or "If no external power". Set the auto switch off time of the machine to any whole number of minutes between one and thirty. Set auto switch off of the backlight to Yes or No. Set the auto switch off time of the backlight to any whole number of minutes between one and ten. Set the backlight key as Disabled or Enabled.
Special keyboard	[Psion-K]	Switch between "Special keyboard selected" and "Standard keyboard selected". There is no dialog.

Special menu

Remote link	[Psion-L]	Set remote link On or Off Set the baud rate to one of 300, 600,1200, 2400, 4800, 9600 or 19200. Set the communications port to A, B or C. Set any extra parameters required.
Wrap on	[Psion-W]	Switch between "Wrap is on" and "Wrap is off". When Wrap is on , displayed text does not disappear off the edge of the screen, but continues on the next line. There is no dialog.
Zoom in	[Psion-Z]	Increase the character font size.
Zoom out	[Shift-Psion-Z]	Decrease the character font size.
Exit	[Psion-X]	Return to the Startup Shell (Psion logo)

Font sizes and zoom settings

The *Workabout* can display characters in many fonts. The command Processor uses five different font sizes. The use of *Zoom in* and *Zoom out* increases or decreases font size, (see above). *Zooming in* (from a larger to a smaller font) will re-display some of the information that scrolls off the top of the screen in a larger font size.

The five different zoom settings give the following number of characters per line and lines of text on the screen:

Font size	Number of lines	Characters per line
6	12	39
8	9	29
11	7	27
13	6	23
16	5	18

Batch file processing

Batch files are plain text files, containing a sequence of Command Processor commands, each on a separate line. By default, EPOC batch files have extension *.btf*. They are normally expected to be stored in a *\btf* directory.

To invoke the batch file with name *backup.btf*, just type `backup` at the `>` prompt in the Command Processor. Batch files are always run *synchronously*. This means that while the batch file is executing, the user **cannot** task back to the Command Processor and continue to issue other commands. No additional commands can be typed into the Command Processor until any batch files it is executing have completed.

If necessary, the full path of the batch file should be given too. Thus:

```
loc::b:\batch\backup
```

or

```
rem::c:\workabt\devp\restore.bat
```

The extension needs to be supplied only in cases where it differs from *.btf*. Note that *loc::* specifies the local filing system (the default) and *rem::* specifies the remote filing system.

If the batch file name is preceded by *start* (see *Launching programs* below) it will still be run synchronously; thus:

```
start loc::b:\batch\backup
```

is exactly the same as:

```
loc::b:\batch\backup
```

Batch files can also call other batch files, and so on, up to eight levels deep.

If more complex functionality is required, a *program* should be written, to replace the batch file.

Launching programs

As well as running batch files, the Command Processor can be used to launch programs - either EPOC executables (typically with extension *.img* or *.app*) OPL programs (with extension *.opo*) or OPL applications (with extension *.opa*).

Like batch files, these other programs are run simply by typing their name.

Typing the line

```
dojob
```

has in fact the following effect:

- The Command Processor checks for an internal command with the name `LINK`. If such a command is found, it is executed.
- If no such command exists, the Command Processor looks for a file *dojob.img* in the ROM, and then in a *\img* directory on each of the local drives. If such a file is found it is executed.
- If no such *.img* file exists, the Command Processor looks for a file *dojob.app* in the ROM, and then in a *\app* directory on each of the local drives. If such a file is found it is executed.

- If no such *.app* file exists, the Command Processor looks for a file *dojob.opo* in the ROM, and then in a *\opo* directory on each of the local drives. If such a file is found it is executed.
- If no such *.opo* file exists, the Command Processor looks for a file *dojob.opa* in the ROM, and then in a *\app* directory on each of the local drives. If such a file is found it is executed.
- If no such *.opa* file exists, the Command Processor looks for a file *dojob.btf* in the ROM, and then in a *\btf* directory on each of the local drives. If such a file is found it is executed.

In all cases, the local drives are searched in the order A:, B:, C:, M:.

Note that, for example, a file *dojob.img* will be found in preference to a file *dojob.btf*. To ensure that a file with a specific extension is run, enter the extension explicitly, for example:

```
dojob.btf
```

A program may be run from a directory other than the standard directory for a file of that type, provided the directory is specified explicitly, for example:

```
\mydir\dojob.img
```

will execute the first *dojob.img* file that is found in a *\mydir* directory in one of the local drives (the drives are searched in the same order as is given above).

In general, any drive, path and/or extension that is included in the command will confine the search appropriately.

Additional command line parameters can be passed to a program. For example,

```
dojob.app b:
```

will execute *dojob.app*, passing it a command line containing the string "b: ".

Synchronous and asynchronous programs

In contrast to batch files, which are always run synchronously (see above), programs can be run either synchronously or, exploiting the multi-tasking capabilities of the *Workabout*, asynchronously.

By default, a program is launched synchronously, if its name is entered on its own. This means that while the program is executing, the user **cannot** task back to the Command Processor and continue to issue other commands.

To run a program asynchronously, prefix the program name with the keyword *START*. This means that while the program is executing, the user can task back to the Command Processor and continue to issue other commands.

When the program is started, it will by default (assuming that it has some form of user interface) take over the foreground screen. To access the Command Processor, or indeed any other tasks that may be running on the *Workabout* at the time, press Psion-Tab, ("Switch task"), as many times as is required. Every time Psion-Tab is pressed, a different program cycles into foreground.

Note that there is no need to quit the foreground program in order to start another - start a new program by pressing the Psion-Tab key combination until you get into the Command Processor, then type the name of the program at the command line, (with or without the preceding *START*, as required).

However, users should avoid starting up new programs unnecessarily - since each additional program reduces the processing time, memory and other resources available for the programs already running.

Terminating programs

Many programs contain mechanisms within themselves for the user to terminate them. For example, they may contain an Exit command.

Alternatively, programs can be killed from the Command Processor, using either the *STOP* or *KILL* commands. As is explained in the alphabetical listing below, *STOP* should be used in preference to *KILL* whenever possible. The relevant menu options should be used to stop the built-in Psion applications.

Note that if a program is run synchronously, it is not possible to terminate it by tasking to the Command Processor that launched it - since that Command Processor is inaccessible until the program terminates.

The Psion-Shift-Ctrl-K keypress combination kills the current foreground process. In extreme circumstances, recourse to resetting the *Workabout* may be required.

When a program launched from the Command Processor terminates, either normally or abnormally, the Startup Shell reports this fact to the user.

The command line editor

Up to 32 previous commands can be reviewed by means of the Up and Down cursor keys at the command line. Any previous command displayed in this way can be edited before being issued again.

To clear the command line at any time, press Esc.

As would be expected, each individual command is entered to the *Workabout* by pressing Enter after typing its name. The command name can **never** be abbreviated. The names of the built-in commands and their parameters are not case sensitive. Parameters to user-developed applications, however, **may** be case sensitive.

Certain other keys and key combinations also have special effects in the command line editor, (or when a batch file is running).

Enter	Terminates a line of input.
Del	Del on its own deletes the character preceding the cursor, or any highlighted text (see below).
Left/Right	Move the cursor left or right along the line being edited.
Up/Down	Recall previous commands. The up and down arrow keys move backwards and forwards respectively through the last 32 commands (maximum) that were issued.
Esc	Esc on its own deletes the entire line. This keypress also breaks out of a batch file or a long listing, and will cancel a <code>WAIT</code> command

There are also several special keypress combinations:

Shift-Del	Deletes the following character, (if no text is highlighted).
Psion-Del	Deletes from the cursor to the start of the line, (if no text is highlighted).
Shift-Psion-Del	Deletes from the cursor to the end of the line, (if no text is highlighted).
Shift-Left	Moves the cursor left, highlighting (in reverse video) all characters passed. If the Shift key is kept depressed and Right is then pressed the text will be unhighlighted again as the cursor passes.
Shift-Right	Moves the cursor right, highlighting (in reverse video) all characters passed. If the Shift key is kept depressed and Left is then pressed the text will be unhighlighted again as the cursor passes.
Psion-Shift-Ctrl-Left	Highlights (in reverse video) the current word.
Psion-Shift-Ctrl-Right	Highlights (in reverse video) the current line. This is somewhat pointless when editing batch files, since all you can then do is delete the line (which is more easily done by simply pressing Esc). It is supplied for the benefit of user-developed applications, which have access to the same editor.
Ctrl-Left	Moves the cursor to the beginning of the current word being edited, or of the preceding word if already in that position.
Ctrl-Right	Moves the cursor to the beginning of the next word to the right, or to the end of the line if already on the last word.
Psion-Left	Moves the cursor to the beginning of the line being edited.
Psion-Right	Moves the cursor to the end of the line being edited.
Psion-Down	Recalls last command issued.
Psion-Up	Recalls earliest recallable command.

Shift-Esc	The "Help" hotkey combination. It brings up the Command Processor Help menu.
Ctrl-Shift-Esc	The "Help index" hotkey combination. It is used to bring up a general Help index.
Psion-Tab	The "Task" hotkey combination. It allows switching between the Command Processor and other tasks, (if any).
Ctrl-C	The "Break" hotkey combination cancels a WAIT command. It has the same effect as pressing Esc.
Ctrl-S	The "Pause" hotkey combination. Pauses a batch file or a long listing.

Pausing the screen display

All commands automatically pause when a screenful of information has been displayed. In all cases, pressing Enter resumes the display. The Esc key can usually be used to terminate the command listing.

Commands do not pause when being executed within a batch file.

Running multiple System Interfaces

It is not possible to run an additional copy of the Command Processor. If this is attempted by entering at the command line prompt of the Command Processor:

```
start sys$cmdp
```

a "File already exists" dialog will appear.

It is, however, possible to run the System Screen at the same time as the Command Processor. To do this enter at the command line prompt of the Command Processor:

```
start sys$gsys
```

The Task key combination (Psion-Tab) can then be used to switch between the two system interfaces, (and any other tasks that are also running).

Only one copy of the System Screen may be started - if one is already running a "File already exists" dialog will appear. It is not possible to install the Command Processor in, or to start the Command Processor from, the System Screen.

Files and directories

File In Use error messages

If any *Workabout* application has a file open, no other application is allowed to alter that file in any way.

For this reason, some file commands may unexpectedly fail, when issued from the Command Processor.

For example, it is impossible to make a complete copy of all the files in a directory if any one (or more) of these files is in use by another application. Commands to delete or rename such a file will likewise report an error.

Default path and current directory

Unlike MS-DOS, in which there is always a current logged directory *for each different drive* (and so there are as many current directories as there are drives), in EPOC there is only one current directory for each running process. Indeed, instead of referring to a *current directory*, it is preferable to refer to the *current path*, since the drive is included too (and the filing system).

Unlike on the Psion HC, there is no single command to set the default path on the *Workabout*. The drive letter followed by a colon should be used to set the current drive in the Command Processor or in batch files, and the `CD` command to change the current directory.

Note that if the current path is `a:\work\`, the effect of typing `cd b:\play` is **the same** in the *Workabout* Command Processor as in MS-DOS, but is limited to local drives.

However, in EPOC, there is a different current path for each current application. Changing the path in one application does not alter the path in another application. This may be regarded as a significant improvement over MS-DOS, where the currently logged directories in the command processor are often annoyingly altered by running (synchronously!) another process. By the time the second process has terminated, the MS-DOS command processor may have been logged to a different drive and a different directory.

Note that any changes to the path of the Command Processor inside a batch file will continue to have effect after the termination of the batch file, since no new process is run up just by virtue of a batch file being executed.

Specifying file names as command parameters

In all, a full file specification is regarded as having *five* parts:

- A *filing system* (e.g. *loc::* or *rem::*).
- A *drive* or *device* (e.g. *b:*).
- A *path* (e.g. ** or *\accounts\jan*).
- A *filename* (e.g. *job*).
- An *extension* (e.g. *.img*).

Frequently, it is possible to omit part of the full specification of the path of a file, when giving a filename as a parameter to a command in the Command Processor. Any missing parts of the filename will be filled in from the current path. In the *Alphabetical listing* below `filespec` implies a full file specification as listed above, `filename` means the name of the file only.

For example, if the current path is *m:\img*, the command `attrib job.img -r` operates on the file with full specification *m:\img\job.img*. However, the command `att b:\backup\job.img` operates, naturally enough, on the file *b:\backup\job.img* - regardless of the current path.

If the current directory on *b:* is *\img*, the command `attrib b:job.img` operates on a file *b:\img\job.img* (if one exists) - not on any file *job.img* in the root directory of *b:*. The reason for this is that the filename *b:job.img* is interpreted as having only the three parts:

- a drive (*b:*)
- a basic name (*job*)
- an extension (*.img*).

Since the *path* component is missing, this is taken from the current path for the drive.

To specify a file *job.img* on the root directory of *b:*, type:

```
b:\job.img
```

including the crucial `\` character that indicates the path.

Specifying paths as command parameters

Just as it is often possible to omit part of the full specification of the path of a file, when giving a filename as a parameter to a command in the Command Processor, so also is it often possible to omit part of the full specification of a *path* (or *directory name*), when issuing a command such as `cd`, `md`, or `rd` that expects a directory name as a parameter. Any missing parts of the directory name will be filled in from the current path.

Thus if the current drive is *m:* and the current path is *\img*, the command `md tools` is equivalent to `md m:\img\tools`. Likewise `cd tools` is equivalent to `cd m:\img\tools` and `rd tools` is equivalent to `rd m:\img\tools`.

When specifying a path, a trailing backslash can generally be used to clarify that a name is a directory rather than a file.

Wildcards

As in DOS, the wildcards ? and * may be used in the file name and/or the extension components of a file specification, where ? represents any single character and * represents zero or more characters.

The use of * differs from its use in DOS in that, on the *Workabout*, it is possible to use, for example:

```
a*b.*
```

to select all files whose file name starts with *a* and ends with *b*. In DOS, *a*b.** has the same effect as *a*.**.

The requirements of generality

Evidently, although some of the syntax of commands such as *md* and *rd* is similar to that of corresponding commands in DOS, in other aspects the requirements of the *Workabout* Command Processor syntax for these functions may be found more restrictive than in DOS.

In fact, the extra restrictions stem from a central design feature of the EPOC operating system - the requirement for applications to be able directly to address files on a remote computer, where the remote filing system may well be *other than DOS*. Alternative remote filing systems that need to be borne in mind, as well as just DOS, include Unix, Vax VMS, and the Apple Macintosh operating system.

Thus if the *Workabout* is connected to an Apple Macintosh computer, the following could be entered at the command line:

```
dir rem::hd40:Workdevp:stock
```

Accordingly, the *Workabout* Command Processor does not simply approach filenames and path specifications in terms of presence or absence of backslashes. For example, were the Command Processor to insert a backslash at the end of the above command, "on behalf of the user", this would, most decidedly, *not* be what the user intended. Instead, the approach is much more general, in terms of the five part breakdown of filename specifications discussed two sections previously.

It should be noted that Psion computers allow the use, for example, of the "+" character in filenames, which is not allowed in MS-DOS for instance. For portability between filing systems and applications on different manufacturers machines it is recommended that only letters and numbers are used in filenames. At the very least filenames should be restricted to the MS-DOS naming convention. The allowed characters in an MS-DOS filename are:

```
A-Z a-z 0-9 $ % ' - @ { } ~ ` ! # ( ) &
```

MS-DOS filenames are case insensitive, (upper and lower case letters are treated the same).

Different DOS versions handle accented characters differently. It is recommended that accented characters are not used in filenames.

Filenames that are keywords, the names of ports or device drivers, etc. on the *Workabout* or any remote system, should also be avoided, e.g. COM1, LPT2, etc.

Similarly, the *Workabout* provides only limited support for the syntax of "double dot" (for the parent directory) and "single dot" (for the current directory).

This extra discipline has its occasional drawbacks. However, the advantages that it brings with it are an important part of the vital *inter-connectable* feature of the *Workabout*.

Alphabetical listing

Notation

This list of commands uses the following syntax:

```
COMMAND supplied-parameter [optional-parameter | optional-parameter]
```

or:

```
COMMAND [optional-parameter] {supplied-parameter | supplied-parameter}
```

Items shown in square brackets ([]) are optional. To include optional information, type only the information within the brackets. Do not type the square brackets themselves.

The use of the vertical bar (|) symbol between parameters means that one parameter OR the other parameter can be used, (but not both). Type only one parameter. Do not type the vertical bar itself.

If there are alternatives but one or other **must** be included, the options are enclosed in curly brackets ({ }), if required for clarity. Type only one parameter. Do not type the curly brackets themselves.

Shortened versions of commands are **not** available. In the above (generalised) example, COM would not be an acceptable shortened form of COMMAND. The *Workabout* Command Processor thus differs from the Psion HC Command Processor which does allow command abbreviations.

Commands can be typed in any combination of lower and upper case. For example, except where clearly stated to the contrary below, variants such as echo on and echo ON are completely equivalent.

A command keyword must be separated from any following parameter by at least one space character.

Default values may be assumed if some options are not supplied. Default values of particular commands are given in the individual command descriptions which follow.

Note:

The following list actually contains entries that are not really commands of the Command Processor, in the strict sense, but are just the name of a program in the ROM, for example LINK. However, this distinction may seem irrelevant to the user, and so, for convenience, these commands are listed as well. DOS calls these *external commands*.

ATTRIB Set or clear file attributes

```
ATTRIB [system:][drive:][path]filename[.extension] [+a|-a] [+s|-s] [+h|-h] [+r|-r]
```

Set or reset the archived (a), system (s), hidden (h) and/or read-only (r) attributes of a file.

For example, `attrib -a +s list.dat` clears the archived attribute and sets the system attribute of *list.dat*, without altering its hidden or read-only attributes.

For each of h, s, a, and r, a prefix of - clears the corresponding attribute, and a prefix of + sets it. The four attributes can be specified in any order, and any combination of the four bits can be set or cleared at once. Omitting all four is pointless: nothing will happen.

The ATTRIB command accepts a file specification containing wildcards.

Note that the DIR command includes the attributes of files as part of its display.

CALC Run the calculator application

```
[START] CALC
```

Run the Calculator application, Calc.

If preceded by START, Calc will be run asynchronously.

Note:

Help on using the Calculator application is available by pressing Shift-Esc.

For full information on using the Calculator application, see the *Workabout User Guide*.

CALL Call a batch file from inside another batch file

```
[CALL ][system:][drive:][path]batchfile[.extension] [batch-parameters]
```

Calls a batch file from inside another batch file.

Omitting the CALL command and just using the file specification "chains" the named batch file, and does not return to the current batch file on completion.

CD **Display or alter current directory**

```
CD [system:][drive:][path]
```

Change to a different path, or (if `path` is omitted) displays the current path. Note that `system:` can only be `loc:`.

For example, to change the current directory from `\work\product\` to `\work\admin\`, type:

```
cd \work\admin\
```

To move to a directory below the current one, only the path from the current directory needs to be entered. So to change from `\work\admin\` to `\work\admin\forms\`, the following command could be used:

```
cd forms\
```

The trailing backslash in the above commands can be omitted. Thus `cd forms` instead of `cd forms\` will do the same thing.

Use `CD [drive:]\` to change to the root directory of a drive, or of the current drive if `drive:` is omitted.

For example, type:

```
cd b:\
```

to change to the root directory of `b:`.

Typing `cd b:` changes nothing and just displays the current path for `b:`.

To change drive use:

```
drive:
```

CHDIR **Change directory**

```
CHDIR [system:][drive:][path]
```

Changes to a different path, or (if `path` is omitted) displays the current path. This command is exactly the same as `CD`.

CLS **Clear the screen**

```
CLS
```

Clear the screen, leaving the `>` prompt in the top left corner.

COMMS **Run the communications application**

```
[START] COMMS [system:][drive:][path][filename[.extension]]
```

Run the communications application, Comms.

If preceded by `START`, Comms will be run asynchronously.

If no file specification is provided, and the current drive is `m:`, (and `comms.sco` does not already exist), a dialog is presented asking:

```
Create "M:\SCO\COMMS.SCO"?
```

If 'Y' is then pressed the file `m:\sco\comms.sco` will be created, along with a file `m:\scr\comms.scr`, for later use. Note that files with the extension `.scr` are editable communications scripts files, and files with the extension `.sco` are translated communications script files. The user is then presented with the terminal emulation screen.

Otherwise, if `comms.sco` does already exist, then no dialog is presented. Note that it does not matter whether `comms.scr` exists or not.

If any system, drive or path is provided, but no filename, the `comms.sco` file will be placed in the specified location. The default directory for translated communications script files (extension `.sco`) is `\sco\`, and it is recommended that this is where all files of this type are kept. Note that the default directory for untranslated (editable) communications script files (extension `.scr`) is `\scr\`, and keeping all files of this type in their directory is also recommended.

If a filename is given, a *.sco* file and a *.scr* file of that name will be created (as above) depending on whether they currently exist or not.

An extension to the filename may be provided that differs from *sco*, but this is not recommended, since it would make identification of the file type difficult.

Note:

Help on using the Communications application is available by pressing Shift-Esc.

For general information on using the Communications application, see the *Workabout User Guide*, and for full details refer to the *Psion Series 3 3Link (RS232)* manual.

COPY

Copy file(s)

```
COPY source_filespec destination_filespec [/s] [/y]
```

Copy one or more files or directories, possibly changing their names in the process.

If the */s* flag is used then all subdirectories of a specified source directory will also be copied.

The */y* switch allows overwriting without confirmation.

Any part of the target filename that is not specified, (for example, the extension), and which cannot be filled in from corresponding parts in the current drive and path, is taken from the corresponding part of the first pathname.

If the destination filename is that of an existing file, then that file will be overwritten. Unless */y* is specified, a "File exists" dialog appears, requesting confirmation, before the file is overwritten.

The wildcards *** and *?* can be used to copy multiple files.

For example:

```
copy fred.* a:\jim.*
```

copies all files with a file name of *fred*, but any extension, from the current directory into the root of *a:*, renaming them, without altering the extension in the process.

As a possibly surprising example, if the current drive is *m:* and the current path is **, the command `copy a:\file.lis file.old` has the effect of copying the named file to *m:\file.old*.

The names of the source files are listed on the screen as they are copied.

A file cannot be copied onto itself. If an attempt is made to do this, the `COPY` command quits, and an error message such as the following is displayed:

```
Copy failed : 0 files
```

DATA

Run the database application

```
[START] DATA [system:][drive:][path][filename[.extension]]
```

Run the database application, *Data*.

If preceded by `START`, *Data* will be run asynchronously.

If no file specification is provided, and the current drive is *m:*, (and *data.dbf* does not already exist), a dialog is presented asking:

```
Create "M:\DAT\DATA.DBF"?
```

Otherwise, if *data.dbf* does already exist, then it will be presented directly for editing.

If any system, drive or path is provided, but no filename, the *data.dbf* file will be placed in, (or retrieved from), the specified location. The default directory is *\dat*, and it is recommended that this is where all database files are kept.

If a filename is given, a *.dbf* file of that name will be created (as above) and/or presented for editing depending on whether it currently exists or not.

An extension to the filename may be provided that differs from *.dbf*, but this is not recommended, since it would make identification of the file type difficult.

For general information on using the Database application, see the *Workabout User Guide*.

This application may be useful for quickly looking at or manipulating OPL data files. There are, however, certain restrictions and differences that must be borne in mind. See the *Database files* chapter of the *SIBO OPL Technical Reference* manual for further details.

Note:

Help on using the Database application is available by pressing Shift-Esc.

DATE**Display date**

DATE

Display the current date in the default format, or that specified by the most recent `SETDEF` or menu command.

The default display format is:

```
dd/mm/yy
```

For example `12/10/95` will be displayed if the current system date is 12 October 1995.

If the day of the month or the month number itself has only a single digit, a leading zero is displayed. The first day of January 1996 is displayed as:

```
01/01/96
```

Use the Time and Date option on the Time menu to change the date.

Use the `SETDEF` command or the Formats option of the Time menu to change the format in which the date is displayed.

DEL**Delete file(s)**

```
DEL [system:][drive:][path]filespec [/s] [/y]
```

Delete the specified file or files.

If the `/s` flag is used, all subdirectories and the files in them are deleted.

If the `/y` flag is used, no confirmation is asked for. This is intended for use in batch files.

To delete more than one file at a time, the wildcards `*` and `?` can be used. Alternatively, the following deletes all files in the directory *temp* (in the current path):

```
del temp\
```

The trailing backslash may be omitted, in which case a dialog is presented: "Delete all files in directory?". The Y key should then be pressed to carry out the deletion.

As files are deleted, the names of the files deleted are listed on the screen.

The `ERASE` command is exactly the same as `DEL`. See also the command `RD`, which deletes directories.

DIR**Full directory listing**

```
DIR [system:][drive:][path][filespec] [/s] [/b]
```

List all the specified files in a directory, together with their sizes, the time and date of their last modification, and their attributes.

The listing pauses automatically after each screen of information, prompting the user to press enter to continue.

The wildcards `*` and `?` can be used in the file specification.

The `/s` flag causes all subdirectories to be listed as well.

The `/b` flag causes bare (filenames only) output to be displayed.

ECHO Display message, set or display echo mode

```
ECHO [[text]][ON | OFF]
```

Display the message `text`, or set the echo mode in batch files, or display the current echo mode.

For example:

<code>echo Processing</code>	Displays the message <code>Processing</code> on the next line of the screen.
<code>echo on</code>	Switches the echo mode in batch files to ON.
<code>echo off</code>	Switches the echo mode in batch files to OFF.
<code>echo</code>	Displays the current echo mode in batch files, e.g.: <pre>Echo is OFF</pre> OR <pre>Echo is ON</pre>

EDIT Run the text editor

```
EDIT [system:][drive:][path]filename[.extension]
```

Run the text editor program.

The three different editors for batch files, OPL programs and communications scripts are implemented as aliases of the Word application.

A filename must be given (no default names are provided).

If no extension is given then an alias of Word that behaves as a batch file editor is started, and the extension defaults to `.btf`. In this instance there are no Translate and Run menu options available, since they are not relevant.

If the filename is given an extension of `.opl` then the Word alias behaves as an OPL program editor. If the filename is given an extension of `.scr` then it behaves as a communications script editor. In both these instances, Translate and Run menu options are available (translation is different for `.scr` and `.opl` files).

If a path is not given then `\btf\`, `\opl\` or `\scr\` is assumed as the directory for a batch file (`.btf`) an OPL program (`.opl`) or a communications script (`.scr`) respectively.

If any other extension is given for the filename and no path is specified then the file will be put in a `\btf\` directory.

If you supply a partial path, the Command Processor will try to use the results of your last `CD` command on the relevant drive.

If a filename is not supplied, the error message "Too few parameters" is displayed.

If a filename **is** given, but no extension:

- If a file called `filename.btf` does not already exist, then a dialog is presented, asking:

```
Create "M:\BTF\FILENAME.BTF"?
```

If Y is then pressed the editor will display a blank file of name `filename.btf`, ready for editing.

- If a file called `filename.btf` does already exist, then no dialog is presented, and the existing file `filename.btf` is presented for re-editing.

Similar dialogs and messages are presented for files with `.scr` and `.opl` extensions.

When saved, or the editor is exited, files are stored in the specified directory.

Notes:

The `EDIT` command starts an alias of the Word application. When `EDIT` (or `START EDIT`) is used the process started will appear in an `LPROC` or `LSEG` listing as an instance of Word. As well as using `EDIT` directly from the Command Processor or from a batch file, aliases of Word can be started from one of the editor icons in the System Screen.

The first time that `EDIT` is used to run the batch file editor, the program editor or the communications script editor, a `\wdr\` directory will be created (if it does not already exist). This directory is used for the storage of printer drivers and template files. Furthermore, the first time the program editor is used the default template `default.o` is stored in this directory.

Help on using the Editors is available by pressing Shift-Esc. All the editors function in the same way.

For further information on the various editors see the *Workabout User Guide*. There is more information on the Communications Script Editor in the *Psion Series 3 3Link (RS232)* manual.

ERASE **Delete file(s)**

```
ERASE [system:][drive:][path]filespec [/s] [/y]
```

Delete the specified file or files.

If the `/s` flag is used, all subdirectories and the files in them are deleted.

If the `/y` flag is used, no confirmation is asked for. This is intended for use in batch files.

To delete more than one file at a time, the wildcards `*` and/or `?` can be used. Alternatively, the following deletes all files in the directory `temp` (in the current path):

```
erase temp\
```

The trailing backslash may be omitted, in which case a dialog is presented: "Delete all files in directory?". The `Y` key should then be pressed to carry out the deletion.

As files are deleted, the names of the files deleted are listed on the screen.

The command `DEL` is exactly the same as `ERASE`. See also the command `RD`, which deletes directories.

ERRLEVEL **Display error state**

```
ERRLEVEL
```

Display the error state, which may be `TRUE` or `FALSE`, e.g.:

```
Errorlevel is FALSE
```

It reports whether the last command or process to finish left `ERRORLEVEL` set as `TRUE` or `FALSE`. This may be useful when debugging batch files.

EXIT **Terminate the Command Processor**

```
EXIT
```

Present a dialog offering options to terminate the Command Processor or cancel the command.

On confirmation of an `EXIT` command typed directly into the Command Processor (or of the selection of the Exit option from the Special menu) the Command Processor is terminated. If there is no other task running on the machine, the *Workabout* will then automatically re-launch the Startup Shell process, as explained in the chapter *Introduction to the Workabout*. If one or more other tasks are running, the machine will switch tasks to whichever running application was last used.

If the `EXIT` command is executed from a (nested) batch file, all levels of batch processing are terminated immediately and the confirmation dialog presented. On confirming the `EXIT` command, the Command Processor terminates in the same way as when `EXIT` is typed directly into the Command Processor.

FILES **List open files**

```
FILES [system:][drive:]
```

List all open files on the specified drive. For each file the full file specification, the program using the file and its process number are given.

If the drive is not specified, open files on the current drive are listed.

FOR Run a command for the files in a set

```
FOR %variable IN (set) DO command [parameters]
```

Run a command for each file in a specified set of files.

The replaceable parameter `%variable` is used by the `FOR` command to hold the name of each file as it is being processed.

The set of files is specified by `set`. The wildcards `*` and `?` can be used. The parentheses are always required.

The command to carry out for each file in the set is specified by `command`. The parameters or switches for the specified command are given by `parameters`, if the command needs any.

To use the `FOR` command in a batch file, specify `%%variable` instead of `%variable`.

For example, to asynchronously run all application files in the `a:\app\` directory:

```
for %f in (a:\app\*.app) do start %f
```

From within a batch file, this same sequence of operations would be performed by the line:

```
for %%f in (a:\app\*.app) do start %%f
```

FORMAT Format and re-label local volume

```
FORMAT [drive:][volname]
```

Format a local volume i.e. a RAM or Flash SSD in drive A: or B:, or the internal drive M:RAMDRIVE. It also renames the volume with the optional `volname`.

The command detects the type of SSD and places the appropriate format information onto the disk. This information differs for Flash and RAM SSDs.

For example, `format a:` will format the SSD in drive A: .

The command, `format b:data` will format the SSD in drive B:, giving it the volume name "DATA".

If `drive:` is omitted, a dialog appears asking if you want to format M:RAMDRIVE.

Note that, once the format command is started, no warning is given before the formatting takes place.

The mere fact that there are read-only files on an SSD or the internal drive will not prevent the it from being formatted. However, if an SSD has the write-protection switch set, it will not be possible to format it.

The `FORMAT` command will fail if there is no SSD in the specified drive. In this case, the `FORMAT` request will fail with the error message "Format failed. Not ready".

Another reason for `FORMAT` being disallowed for a disk would be if there are any *open files* on it. In this case, the `FORMAT` request will fail with the error message "File or device in use".

If an SSD needs to be given a volume name at a later date, then the `LABEL` command may be used. To find the current volume name, use the `VOL` and/or `DIR` commands.

GOTO Jump to label in batch file

```
GOTO label
```

Jump to the label `label` in a batch file.

HELP List commands or get help

```
HELP [command]
```

List the available commands, or supply help on a specific command.

Press Shift-Off for access to the Help System, or Ctrl-Off for the Help Index.

IF **Run command conditionally**

```
IF [NOT] {ERRORLEVEL | string1==string2 | EXIST filespec} command [command_parameters]
```

Conditionally run a command or executable file, depending on one of three possible specified conditions.

- The value of `ERRORLEVEL`., for example:

```
IF ERRORLEVEL DEL *.tmp
```

Note that `ERRORLEVEL` can only be `TRUE` or `FALSE`. The DOS syntax:

```
IF ERRORLEVEL n ...
```

is not supported

- Whether two strings (`string1` and `string2`) are equivalent, for example

```
IF ?%1==? DEL *.tmp
```

- Whether a specified file exists, for example:

```
IF EXIST a:\img\tmp.img DEL a:\img\tmp.img
```

KILL **Kill a process**

```
KILL procname [/y]
```

Kill the first process found to match the specification in `procname`. *Note that this is intended for emergency use only.*

If the `/y` flag is used, no confirmation is asked for. This is intended for use in batch files, but should be used with extreme caution.

To kill a specified instance of a number of running tasks, all with the same name, the exact process name must be found out and used. For example:

```
kill job.$09
```

or

```
kill job.$14
```

If there are no processes matching the specification, a notifier stating:

```
Unknown process "Procname"
```

will be presented. Use the `LPROC` command to give the full process names of all current processes.

A confirmation dialog is presented if a process matching the specification is found, reminding the user that `KILL` is for emergency use only:

```
Kill "Procname"  
(Emergency only)
```

Notes:

`KILL` should only be used as a last resort, as it does not allow the process to tidy up before exiting. This is a problem with the Link application, for example, which starts a number of sub-processes that will not be shut down if Link is stopped with `KILL`. To shut down a process, `STOP` should normally be used in preference to `KILL`.

The `KILL` command is designed for use with badly behaved (perhaps partially developed) user-written programs. Built in Psion applications should be stopped using the options available from their menus, from the System Screen or by use of the `STOP` command.

LABEL **Add/alter disk volume name**

```
LABEL [drive:][volname]
```

Label the volume in the specified `drive` with the label `volname`.

If the drive is omitted then the current local volume (i.e. an SSD in the current drive, A: or B:; or the internal ramdrive M:), will be re-labelled with the label `volname`.

If the name `volname` is omitted then a "Delete label" dialog will appear (unless the volume in the specified `drive`, or current drive, has no label).

For example:

```
label a:backup
```

Will re-label the SSD in drive A: as "backup".

If the command `label a:` is now used then the dialog 'Delete label "A:BACKUP" ' will be displayed. Pressing Y then deletes the label, pressing N or Esc abandons the command.

LINK

Start Link program

```
LINK [-b<baud>] [-p<port>]
```

Starts the Link communication software on the *Workabout*. It is always run asynchronously, so `START` is never needed.

If no parameters are supplied, the Link software is started with the default settings, or those used on the last occasion that Link was started, whether by means of the `LINK` command or via the dialogs available in the System Screen and Command Processor menus.

The value of `baud` sets the baud rate. Possible values range from 19200 to 50 inclusive - for a full list of intermediate values, see the *Serial Port* chapter of the *I/O Devices Reference* manual. In the absence of the `baud` command line parameter, the baud rate defaults to 19200.

The only time it is necessary to specify `port` is if there are serial expansion devices in the *Workabout*.

- `-p1` means to use the expansion RS232 port, (port A)
- `-p3` means to use the LIF socket (LIF Converter with attached 3Link inserted) as an RS232 serial port (port C)

Otherwise, if `port` is not specified, the Link software simply uses the first available port in alphabetical order.

Other parameters are also possible, but are omitted from the present description. See the chapter *Mclink*, *Mcprint*, and *Slink* in the *Additional System Information* manual. Just typing `link` should suffice in the majority of cases.

To terminate the Link software at some later stage, type:

```
stop link
```

A Yes/No dialog will be presented asking:

```
Stop "Link"?
```

Y should then be pressed to stop Link.

To discover whether or not Link software is running, type `lproc link`. Note, however, that if the `link` command is issued while Link is already running, no harm will be done.

See the section *Connecting to other computers* in the chapter *Introduction to the Workabout*, for more details.

LLDEV

List logical device drivers

```
LLDEV [device_spec]
```

List all logical device drivers that match the supplied specification. The list includes all ROM-resident logical device drivers, as well as external ones that are currently loaded.

If `device_spec` is omitted, all existing logical device drivers are listed.

For example, entering

```
lldev con
```

displays:

```
Logical devices matching: con
CON (unlimited units)
Matches found 1
```

The value given for `units` is the number of channels that the corresponding logical device driver can support. For the console device (`CON:`) an unlimited number of channels can be opened.

LPDEV List physical device drivers

LPDEV [`device_spec`]

List all physical device drivers that match the supplied specification. The list includes all ROM-resident physical device drivers, as well as external ones that are currently loaded.

If `device_spec` is omitted, all existing physical device drivers are listed.

For example, entering

```
lpdev fsy
```

displays:

```
Physical devices matching: fsy
FSY.REM
FSY.LOC
FSY.ROM
Matches found 3
```

listing the three ROM-resident filing system device (`fsy`) drivers - for `rem::`, `loc::`, and `rom::`.

LPROC List processes

LPROC [`process_spec`]

List information about all specified processes. The information listed is:

- The full process name (in the form `procname.$07`).
- The size, in bytes, of the process data segment (given in hexadecimal).
- The current state of the process.

The total number of matches found is then displayed.

If `process_spec` is omitted, information is listed for all current processes.

Possible values of the state of the process are:

CURRENT	The process is currently receiving CPU time.
READY	The process has some events ready to process, as soon as the CPU is given to the process by the multi-tasking scheduler.
DELTA	The process is "sleeping" (e.g. as a result of calling <code>PAUSE</code> with a <i>positive</i> parameter).
SUS	The process has been suspended.
SEM	The process is waiting for some event to happen.

Additionally, the text `WSusp` will be displayed if the process is *waiting* to be suspended.

For example, entering `lproc` may produce the display:

```
Processes matching: *
SYS$NULL.$01 0300 READY
SYS$MANG.$02 0DA0 SEM
SYS$FSRV.$03 1320 SEM
SYS$WSRV.$04 4DC0 SEM
SYS$SHLL.$05 14C0 SEM
SYS$CMDP.$06 4BC0 CURRENT
Matches found 6
```

As a further example, entering `lproc sys$shll` may produce the display

```
Processes matching: sys$shll
SYS$SHLL.$05 14C0 SEM
Matches found 1
```

One common use of the `lproc` command is to check whether Link software is currently running: `lproc link`.

Notes:

For a process that is an alias of another program, using `START procname` (or just `procname` on its own) will start a process that appears to `LPROC` as an instance of the base process. For example, all text or program editors are aliases of the Word application. In consequence, processes started with `EDIT` or `START EDIT` all appear as instances of Word in an `LPROC` listing.

Note also that Sheet is the user-visible name of the Sh3 process. Thus, a process started with `START SHEET` or with `SHEET` will appear as an instance of Sh3 in the `LPROC` listing.

LSEG

List segments

LSEG [`process_spec`]

List all memory segments currently in use by the specified process(es).

If `process_spec` is omitted, the listing will include the memory segments used by all currently running processes.

The information listed about each memory segment is:

- Its segment address.
- Its size in paragraphs (one paragraph is sixteen bytes).
- Its access count.

Values are displayed in hexadecimal.

The total number of matches found is then displayed.

At the end the display, the total size in paragraphs of all the free segments is given (this gives the same value, when converted into kilobytes, as the `MEM` command).

For example, entering `lseg` may produce the display:

```
Segments matching: *
SYS$NULL.$01 046E 0030 01
SYS$MANG.$02 049E 00DA 01
SYS$WSRV.LDD 0578 00E3 01
SYS$FSRV.$03 065B 01B7 01
SYS$WSRV.$04 0812 0560 01
SYS$SHLL.$05 0D72 014C 01
SYS$CMDP.$06 0EBE 04BC 01
Matches found 7
Total free segments = 6CF0
```

Notes:

For a process that is an alias of another program, using `START procname` (or just `procname` on its own) will start a process that appears to `LSEG` as an instance of the base process. For example, all text or program editors are aliases of the Word application. In consequence, processes started with `EDIT` or `START EDIT` all appear as instances of Word in an `LSEG` listing.

Note also that Sheet is the user-visible name of the Sh3 process. Thus, a process started with `START SHEET` or with `SHEET` will appear as an instance of Sh3 in the `LSEG` listing.

MD **Make directory**

MD [drive:]path

Make a directory.

A directory will be created as a subdirectory of the current directory, unless a different path is explicitly specified.

It is possible to omit the trailing backslash from the `path` specification.

The following commands both create a directory named `\work\` in the root directory of the current drive:

```
md \work\  
md \work
```

The command `MKDIR` (which is identical) is also available.

MEM **Display free memory**

MEM

Display the amount of free RAM, in kilobytes, that is available to programs.

Note that this, in general, exceeds the amount of bytes free in `m:`, as reported by a `DIR` command. The discrepancy is because some parts of internal memory are reserved for code and data segments; not all of it can be allocated to the contents of `m:`.

MKDIR **Make directory**

MKDIR [drive:]path

Make a directory.

A directory will be created as a subdirectory of the current directory, unless a different path is explicitly specified.

It is possible to omit the trailing backslash from the `path` specification.

The following commands both create a directory named `\work\` in the root directory of the current drive:

```
mkdir \work\  
mkdir \work
```

The command `MD` (which is identical) is also available.

PAUSE **Suspend batch file processing**

PAUSE [text]

Suspend batch file processing.

The message `text` is displayed (if supplied).

The prompt

```
Press Enter to continue...
```

is always shown.

When Enter is pressed batch file processing continues by executing the next line of the current batch file.

QUIT **Terminate current batch file**

QUIT

Terminate the current batch file. If batch files are nested, batch processing will continue at the line following that which contains the call to the batch file that executed `QUIT`.

The command has no effect if typed directly into the Command Processor.

RD**Remove directory**

RD [drive:]path [/y]

Delete a directory, including any files in it (and subdirectories).

If the /y flag is used, no confirmation is asked for. This is intended for use in batch files.

Note that, in contrast to MS-DOS, there is no requirement to delete all the files in a directory before removing the directory.

In another difference from MS-DOS, it is perfectly possible, in the *Workabout* Command Processor, to remove the directory where the current path is. All that will happen is that subsequent commands such as `dir` may fail until such time as the current path is changed.

As files and directories are deleted, their names are listed on the screen.

The `rd` command does not accept a wildcard specification.

The identical command `RMDIR` is also supported.

REASON**Get the cause of the last system shutdown**

REASON

Display a numeric code indicating the cause of the last system shutdown, as follows:

- 0 The system started up for the first time (or after a period during which all power had been removed, including the Lithium back-up battery).
- 1 The hardware forced a shut-down because the main battery voltage became too low. This should not happen because the system software receives a non-maskable interrupt if the voltage drops below a certain threshold (but not low enough for the hardware to force a shut-down). This interrupt code automatically switches the hardware off. However, if the clean-up takes too long (because of a poorly designed device driver, for example) the hardware will force the machine off before the interrupt completes - in which case `REASON` returns 1. The environment variables and the contents of `M:` are preserved.
- 3 *Either:*
The user pressed Psion-Ctrl-Del to perform a soft reset. The environment variables and the contents of `M:` will have been preserved.

Or:
This reason is also given if the system was reset because a serious fault occurred while executing code in the operating system kernel. This could result from:
 - a bug in the operating system or a system process;
 - a program bug that managed to overcome the operating system's defences
 - a hardware problem such as a RAM fault.
 The environment variables and the contents of `M:` will be preserved (unless the system detects a memory corruption).
- 4 The user pressed Shift-Psion-Ctrl-Del to perform a hard reset. The environment variables and the contents of `M:` will have been cleared.

For example, if the machine has previously lost all power, entering `reason` will return:

```
Reset code: 0
```

REM**Comment (remark) in batch file**

REM [text]

Comment (remark) in batch file. Note that `REM` must be followed by a space.

The `text` characters become a comment in the batch file.

Any text on a line preceded by `REM` becomes a comment that is not executed when the batch file is run. This is useful for temporarily removing a command line, for example, when debugging a batch file.

REN **Rename file(s)**

```
REN [system:][drive:][path]filespec filename
```

Change the name of a file or files.

The command renames all files matching `filespec` - which can include wildcards.

For example, the command:

```
ren work.* play.*
```

changes the names of all files called *work* in the current directory (regardless of extension) to *play*, with the extension being preserved across the rename.

As files are renamed, they are listed on the screen.

Because it is not possible to rename files from one directory to another, the command fails if any path specified with `filename` (explicitly or implicitly) differs from that of `filespec`.

It is not possible to rename a file to have the same name as a file that already exists.

RMDIR **Remove directory**

```
RMDIR [drive:]path [/y]
```

Delete a directory, including any files in it (and subdirectories).

If the `/y` flag is used, no confirmation is asked for. This is intended for use in batch files.

Note that, in contrast to MS-DOS, there is no requirement to delete all the files in a directory before removing the directory.

In another difference from MS-DOS, it is perfectly possible, in the *Workabout* Command Processor, to remove the directory to which the current path is set. All that will happen is that subsequent commands such as `dir` may fail until such time as the current path is changed.

As files and directories are deleted, their names are listed on the screen.

The `rmdir` command does not accept a wildcard specification.

The identical command `RD` is also supported.

SET **Display, set or delete environment variable**

```
SET [[var]=[value]][varspec]
```

Display or set the value of an environment variable, or delete the variable.

With no parameters, the values of all current environment variables are displayed.

If the environment variable `var` is given, but without any trailing equals (=) sign, the value of the environment variable is displayed.

If the equals sign (=) is present, followed by a value, the environment variable `var` is set to the specified `value`.

If the equals sign is present, but `value` is omitted, the environment variable `var` is deleted.

If the environment variable specification `varspec` is given, the values of all environment variables matching the specification are listed.

For example:

<code>set last</code>	Displays the value of environment variable <code>last</code> .
<code>set last=34</code>	Sets the value of <code>last</code> to the string <code>34</code> , creating it if it did not previously exist.
<code>set last=</code>	Deletes the environment variable <code>last</code> .
<code>set \$WS*</code>	Displays the values of all environment variables whose names start with <code>\$WS</code> .

Values are displayed inside square brackets. The list pauses when the screen is full.

Note that environment names and values are both case dependent. Thus the environment variables `group` and `GROUP` would be distinct.

The value (and, indeed, the name) of an environment variable may contain binary data. When displaying the content of an environment variable, non-printable byte values are displayed as `<04>` or `<01>`, for example. There is, however, no mechanism for *setting* binary values from the Command Processor.

SETDEF

Alter system settings

```
SETDEF [AMnn][ABnn][DDMY | DMDY | DYMD][K0 | K1][S+ | S-][T12 | T24]
```

Alter system settings, (which are otherwise set by menu options).

The `SETDEF` command on its own does nothing - it must be followed by at least one parameter.

The allowed parameters are given below.

<code>AMnn</code>	Auto-switchoff the machine after <code>nn</code> minutes of inactivity. Range 01 to 30. Values outside this range will not give an error, but the setting will not be changed.
<code>ABnn</code>	Auto-switchoff the backlight after <code>nn</code> minutes of use. Range 01 to 10. Values outside this range will not give an error, but the setting will not be changed.
<code>DDMY</code>	Date format DD/MM/YY. Note that the separator (/) can be changed via the menus.
<code>DMDY</code>	Date format MM/DD/YY.
<code>DYMD</code>	Date format YY/MM/DD.
<code>Dn</code>	Set start of week to <code>n</code> , where 0 is Monday, 1 is Tuesday etc.
<code>K0</code>	Select standard keyboard.
<code>K1</code>	Select special keyboard.
<code>S+</code>	Sound on.
<code>S-</code>	Sound off.
<code>T12</code>	Time format am-pm. Note that the separator (:) can be changed via the menus.
<code>T24</code>	Time format 24 hour.
<code>TS+</code>	Summer time on.
<code>TS-</code>	Summer time off.

Sound settings for beeps and key clicks, zoom and text wrap on the screen are not configurable using `SETDEF`.

The default machine settings are:

- Auto-switchoff the machine after 5 minutes of inactivity.
- Auto-switchoff the backlight after 10 minutes of use.
- Date format DD/MM/YY.
- The "start of week" default is Monday.
- Standard keyboard, (unless the machine has been factory-configured for the special keyboard).
- All sound is on.
- Beeps are loud.
- Key clicks are loud.
- Time format am-pm. The separator is a colon (:).
- Summer time off.

- Zoom is on setting 3 (see table for zoom settings in the *Font sizes and zoom settings* subsection earlier in this chapter).
- Wrap is off.

SHEET **Run the spreadsheet application Sh3**

```
[START] {SHEET|SH3} [system::][drive:][path][filename[.extension]]
```

Runs the spreadsheet application Sh3. Sheet is an alias for Sh3.

If preceded by `START`, Sh3 will be run asynchronously.

If no file specification is provided, and the current drive is *m:*, (and *sheet.spr* does not already exist), a dialog is presented asking:

```
Create "M:\SPR\SHEET.SPR"?
```

Otherwise, if *sheet.spr* does already exist, then it will be presented directly for editing.

If any system, drive or path is provided, but no filename, the *sheet.spr* file will be placed in, (or retrieved from), the specified location. The default directory is `\spr\`, and it is recommended that this is where all spreadsheet files are kept.

If a filename is given, a *.spr* file of that name will be created (as above) and/or presented for editing depending on whether it currently exists or not.

An extension to the filename may be provided that differs from *.spr*, but this is not recommended, since it would make identification of the file type difficult.

Notes:

Help on using the Spreadsheet application is available by pressing Shift-Esc.

For further information on using the Spreadsheet application, see the *Workabout User Guide*.

SHIFT **Shift batch file parameters**

```
SHIFT procname
```

Shift the replaceable parameters of a batch file one position to the left. Thus `%1` becomes `%0`, `%9` becomes `%8` etc.

The command `SHIFT` alters the values of the replaceable parameters `%0` to `%9` inclusive by copying each parameter into the one prior to it. Thus the value of `%1` is copied to `%0`, the value of `%2` is copied to `%1`, and so on. This can be used to help write a batch file that does the same operation on an unspecified number of parameters.

The `SHIFT` command can also be used to construct a batch file that will accept more than 9 parameters (in addition to the name of the executable). If more than 9 such parameters are specified on the command line, those that appear after the ninth (`%9`) can be moved one at a time into `%9` by repeated use of `SHIFT`.

There is no reverse `SHIFT` command. Once the `SHIFT` command has been carried out, the value of `%0` that existed before the shift is not recoverable.

The following batch file, `PSIDEL.BTF`, shows how to use the `SHIFT` command with any number of parameters. It deletes a list of files from a specific directory. The parameters are the directory name followed by any number of filenames.


```

ECHO off
REM PSIDEL.BTF deletes any number of files from a given directory.
REM The command uses the following syntax: psidel dir file1 file2 ...
SET fromdir=%1
:getfile
SHIFT
IF "%1"==" " GOTO end
DEL %fromdir%\%1 /y
GOTO getfile
:end
SET fromdir=
ECHO All done

```

START

Start a process asynchronously

START procname

Launch the given process and return immediately.

Starts the first process found matching the specification in `procname`, (asynchronously).

Notes:

For a process that is an alias of another program, using `START` will start a process that appears to `LSEG` or `LDEV` as an instance of the base process. For example: all text and program editors are aliases of the Word application. Using `START EDIT` will start an instance of Word. It will thus appear in an `LPROC` or `LSEG` listing as an instance of Word. Using `WORD` or `START WORD` is banned artificially.

On the other hand, `START SHEET` will start an instance of the Sh3 application. Be aware that a process started with `SH3` or `START SH3` cannot, however, be stopped with `STOP SHEET`. The user-visible name Sheet is only used to start an instance of the `sh3.img` program running.

STOP

Stop a process

STOP procname [/y]

Terminate the named process or processes matching the specification in `procname`.

Processes are sent a termination message.

If the `/y` flag is used, no confirmation is asked for. This is intended for use in batch files.

To stop a specified instance of a number of running tasks, all with the same name, the exact process name must be found out and used. For example: `stop job.$09` or `stop job.$14`.

For most applications, the effect of being stopped is identical to being killed, (see the `KILL` command). The application is interrupted immediately, with no chance being provided for data to be saved to file or to environment variables. However, an application can make use of the PLIB function `p_ontermminate` to elect to receive an inter-process message instead of being summarily terminated. For further details, see the descriptions of `p_pterminate` and `p_ontermminate` in the *Error Handling* chapter of the *PLIB Reference* manual.

Notes:

The `STOP` command is designed for use with user-developed programs during the development process. Fully developed (and built-in Psion) applications would normally be stopped using the options available from their menus or from the System Screen.

TIME

Display current time

TIME

Display the current time, in the default format, or the format specified by the most recent `SETDEF` or menu command.

The default display format is:

```
hh:mm:ss [am|pm]
```

For example 09:30:15am will be displayed if the current system time is fifteen seconds after half past nine in the morning.

Use the Time and Date option on the Time menu to change the time.

Use the SETDEF command or the Formats option of the Time menu to change the format in which the time is displayed.

TYPE **Type a text file**

TYPE filename

Print a text or batch file to the screen.

The display pauses itself automatically after each screen full of text.

VER **Display software version numbers**

VER

Display the *Workabout* ROM version number, the date and time that the ROM was mastered, the (EPOC) Operating System version number, the Shell version number and the (Text) System Interface version number.

VOL **Display the disk volume label etc**

VOL [drive:]

Display information about the disk volume on the current or specified drive.

This information includes the volume label, media type, free space in bytes and the total space in bytes. For RAM SSDs, the battery state is also given.

To change the volume name use the LABEL command. The label on a volume may also be changed when the volume is formatted using the FORMAT command.

WAIT **Wait for a process to terminate**

WAIT [procname]

Suspend the Command Processor until the (named) process terminates.

If a process name *procname* is supplied, the message:

```
Waiting for "procname"
```

is displayed and the Command Processor becomes non-interactive until such time as another process terminates.

If no process name is given "any process" is substituted for "procname" and (for example) the message:

```
Waiting for "any process"
```

is displayed.

To break out of this mode, press PSION+ESC. A Yes/No dialog is displayed, headed:

```
Stop waiting for "procname"
```

If N is pressed then a notifier stating:

```
Waiting for "procname"
```

is displayed, but if Y is pressed then the waiting stops.

Commonly, this command will be used inside batch files in the following general pattern:

```
...
<launch program asynchronously>
...
<some processing>
...
wait
...
```

Example:

```
START MYSERVER
IF ERRORLEVEL QUIT
START MY_APP
IF NOT ERRORLEVEL WAIT MY_APP
KILL MYSERVER /Y
```

Notes:

The `LPROC` and `LSEG` commands can be used to determine what processes are running. `WAIT` will only wait for processes started by the Command Processor (unlike `STOP` and `KILL` which hit anything with a matching name). Neither the `LPROC` nor the `LSEG` command can be used to determine how a process was started.

For a process that is an alias of another program, using `WAIT basename` will wait for a process that appears to `LSEG` or `LDEV` as an instance of the base process (`basename`). For example: all text and program editors are aliases of the Word application. Using `WAIT EDIT` will wait for an instance of Word. Using `WAIT WORD` is banned artificially.

In contrast, `WAIT SHEET` can be used to wait for the termination of an instance of the Sh3 application that was started with `SHEET` or `START SHEET`. Be aware that a process started with `SH3` or `START SH3` cannot, however, be waited for with `WAIT SHEET`: you must use `WAIT SH3` instead.

APPENDIX A

TECHNICAL SPECIFICATIONS

Psion *Workabout* Technical Specification

Physical characteristics

Size	180mm x 90mm x 35mm.
Weight	325g (including battery pack).
Screen	Backlit (optional). 240 x 100 pixel LCD. Size 62.4mm x 30mm (2.45" x 1.18"). Pixel pitch 0.30mm x 0.26mm Pixel size 0.27mm x 0.23mm.
Sound	Piezo buzzer.

Power supply

Internal	Nickel-Cadmium rechargeable battery pack, or 2 x AA alkaline batteries.
Backup	3V Lithium CR1620 battery.
External	A Series 3 mains adaptor can be used in conjunction with the LIF Converter unit for main power supply and trickle charging, (see Expansion below). Vehicle power adaptor (24v & 12v cigarette lighter sockets), from Jan/Feb 1997. Psion <i>Workabout</i> Docking Station.

Memory

Built in	1MB Masked ROM (for OS) and 256KB RAM or 1MB RAM. Two SSD drives allow extra storage space on Flash/RAM SSDs, up to 8MB.
----------	---

System information

Processor	NEC V30 running at 7.68MHz.
Operating system	EPOC.

Communications

Protocols:	XMODEM, YMODEM (and ZMODEM, except in early models), giving compatibility with most computer communications software.
Language	Full script language with sample scripts allows automated log-on to electronic mail and other systems, and control of modems.

Expansion

Internal	One internal expansion card can be installed. Currently an RS232/RS232 TTL serial interface and an RS232/barcode reader interface expansion module are available. These must be factory fitted.
External	A combined external power supply connector and fast serial link connector LIF Converter unit is available. This plugs into the standard LIF socket
Peripherals	External peripherals (such as a modems, printers or barcode readers) can be plugged into any suitable socket (where fitted).

Environment

Operating temperatures	-20°C to 60°C..
Storage temperatures	-25°C to 80°C.
Operating humidity	0% to 90% non-condensing.
EMC	FCC Part 15 Class B; CE Mark, E-Mark
Safety	EN60950
Drop	1m onto concrete on any face
Other	IP54 (dust proof & splash proof; some models).

Serial Numbers

The following numbering system has been devised to cover all variants of *Workabout*. The code is 10 Digit Alphanumeric:

G_α_β_δ_XX_xxxx

G denotes that the product is a *Workabout*

α can be **A** to **Z** and denotes the body colour and expansion variant:

Letter	Body	Variant
A	Grey	Normal
B	Grey	TTL + RS232
C	Grey	Barcode + RS232
D	Yellow	Normal
E	Yellow	TTL + RS232
F	Yellow	Barcode + RS232

β can be **A** to **Z** and denotes memory configuration:

Letter	Memory
A	256KB
B	512KB
C	1MB
D	2MB

δ can be **1** to **9** and denotes year of manufacture:

Digit	Year
1	1993
2	1994
3	1995
4	1996
5	1997

X can be **01** to **52** and denote the Week of manufacture:

Digits	Week
01	Starts first of Year at Monday 7a.m.
52	Last Week of December

XXXX can be **0000** to **9999** and is the unique numeric identifier for each PCB built in a week, giving 10,000 permutations each week.

Serial numbers prior to GXCXX310NM

The RS232 port on both Barcode and TTL options uses a Maxim chip to perform the RS232 level conversion. This chip has a power saving feature which means that it will only power up when it detects RS232 signal levels on any of the inputs. This can cause a problem interfacing to devices which also incorporate the same Maxim chip, since neither device will power up. The Ericsson Mobidem incorporates this device and therefore earlier models of the *Workabout* had difficulty communicating with a Mobidem. A modification to the Barcode and TTL PCBs, disabling the power save feature, was introduced into production from serial number GXCXX310NM onwards.

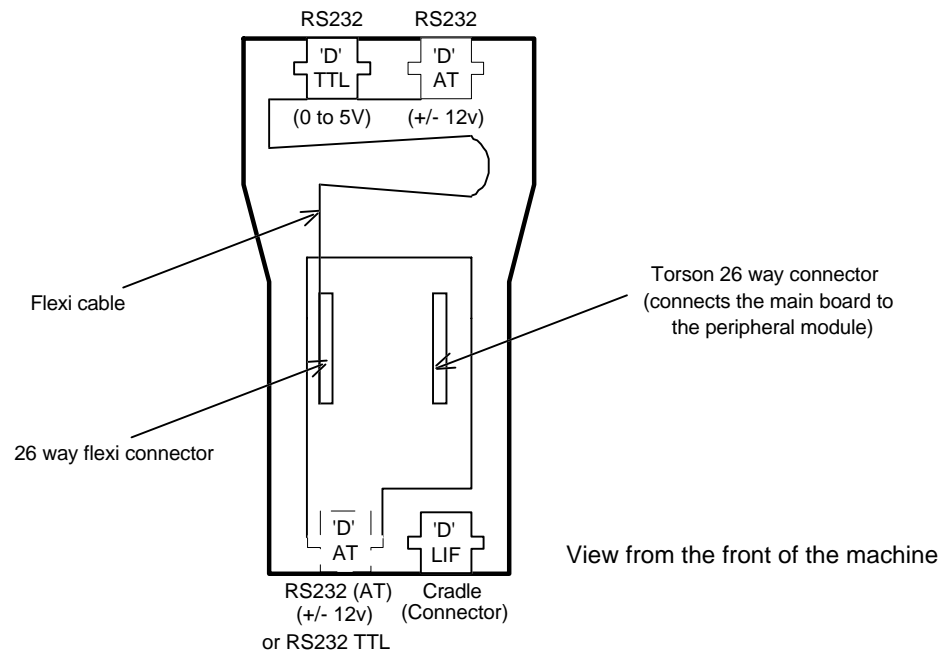
Psion Workabout RS232 / RS232 TTL Interface Module - Technical Specification

This peripheral module provides:

- An RS232 (IBM PC/AT type) interface at 12V (EIA-232) levels. Connector: 9 way D-type male.
- A TTL level RS232 interface at 5V CMOS levels together with a 5V power output at up to 200mA current drive capability. Connector: 9 way D-type female.

The board can be operated at up to 19,200 Baud rate.

The physical arrangement of the board and connectors inside the *Workabout* is shown below:



Remarks:

- The *Workabout* can communicate to the RS232 interface or the RS232 TTL interface, but cannot talk to both at the same time.
- The connectors at the top of the machine are in the default positions.
 - The D-type connector for RS232 may be fitted at the bottom, if required. The bottom RS232 connector and the top RS232 connector cannot both be fitted.
 - The D-type connector for RS232 TTL may be fitted at the bottom, if required. The bottom RS232 TTL connector and the top RS232 TTL connector cannot both be fitted.

- The various input and output signals of the connectors are shown in the table below.

Pin number	RS232 TTL interface	RS232 interface
1	n/c	DCD
2	RX	RX
3	TX	TX
4	VCCEXT	DTR
5	GND	GND
6	DSR	DSR
7	RTS	RTS
8	CTS	CTS
9	n/c	n/c

Note: Under normal conditions the signal levels into the TTL port should not exceed 5.5V DC. Connected devices should be designed or specified to guarantee this is not exceeded. Under fault or transient conditions 6V DC should not be exceeded.

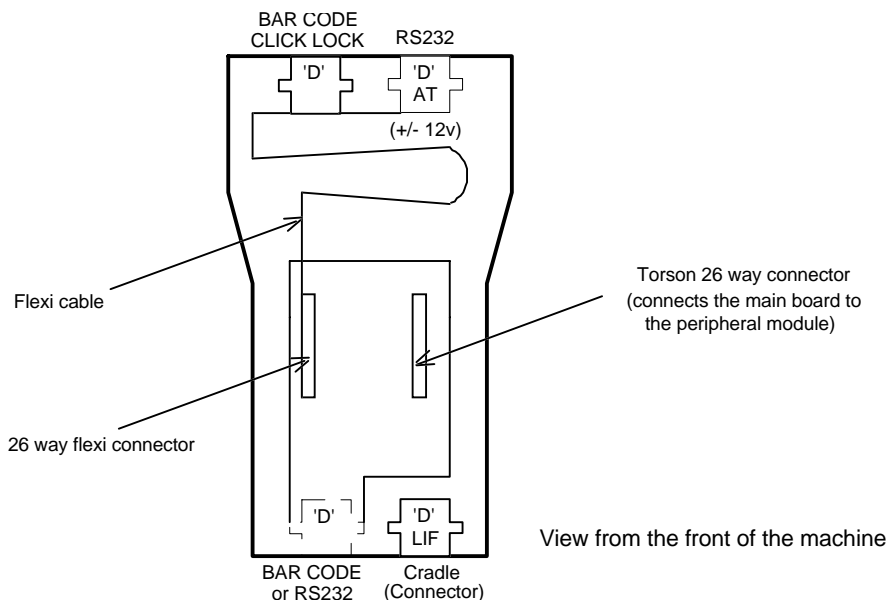
Psion Workabout RS232 / Barcode Interface Module - Technical Specification

This peripheral module provides:

- An RS232 (IBM PC/AT type) interface at 12V levels. Connector: 9 way D-type male.
- A barcode wand interface, together with a 5V power output with up to 200mA current drive capability. Connector: 9 way D-type male (with click lock when mounted at the top of the machine, without click lock when mounted at the bottom)

A Hewlett Packard microcontroller HBCR-1612 is used to read and decode the barcode external input, and then transmit the data as RS232 signals at up to 9,600 Baud.

The physical arrangement of the board and connectors inside the *Workabout* is shown below:



Remarks:

- The *Workabout* can communicate to the RS232 interface or the barcode interface, but cannot talk to both at the same time.
 - The connectors at the top of the machine are in the default positions.
 - The barcode connector may be fitted at the bottom, if required. The bottom barcode connector and the top barcode connector cannot both be fitted.
 - The RS232 connector may be fitted at the bottom, if required. The bottom RS232 connector and the top RS232 connector cannot both be fitted.

- The various input and output signals of the connectors are shown in the table below:

Pin number	RS232 interface	Barcode interface
1	DCD	DCD
2	RX	TXD
3	TX	n/c
4	DTR	n/c
5	GND	DSR
6	DSR	DTR
7	RTS	GND
8	CTS	GND
9	n/c	VCCEXT

Conversion of an HC barcode reader for *Workabout* connection

The details of the wiring changes needed to change the connector on a barcode reader from a six pin minidin for an HC to a 9 way D type for a *Workabout* are given below. These are the wires coming from the barcode reader itself to the connector that plugged into the HC.

The wires connected to the six way minidin pins as below left need to be reconnected to the 9 way D type pins as below right. The signal directions given are from the HC/*Workabout* point of view.

Old 6 way minidin			New 9 way D type		
1	exon	input	5	DSR	input
2	enable	output	6	DTR	output
3	switch	input		not connected	
4	TXD (barcode data)	input	2	TXD (barcode data)	input
5	VCCEXT (barcode power supply)	output	9	VCCEXT (barcode power supply)	output
6	GND (ground)		7 or 8	GND (ground)	

Important notes

The software control for pin 2 on the old 6 way connector was never implemented, therefore extra program code may be required to implement the DTR function on the equivalent pin 6 in the new 9 way connector.

Some barcode readers do not have all of the pins on the 6 way connected to anything, and some have wires that are not connected to any of the pins in the connector. Only make existing connections as above. Any wires or pins unconnected should remain unconnected in the 9 way connector.

Workabout Vehicle Interface Cradle (VIC) - Technical Specification

The *Workabout* Vehicle Interface Cradle (WVIC) is a peripheral for the *Workabout* that provides extra RS232 communications facilities for the *Workabout*, as well as being capable of providing both operating power and internal Ni-Cd battery charging current when supplied from either the main vehicle supply (at +12V) or an auxiliary 10V regulated supply (via the Extended 15-way RS232 port). The interface between the *Workabout* and the Cradle is through the standard Psion LIF connector in the base of the *Workabout*. The *Workabout* is held in place by the standard holster. The WVIC may be dashboard mounted with an optional mounting bracket which allows the unit to be angled for ease of use.

Physical & Environmental

Weight:	317g
Size:	140mm (H) x 92mm (W) x 62mm (D)
Temperature Range:	Operation: 0° C to 50° C
EMC	EN5022, E marked

Serial Communications

The RS232 serial ports (one or three depending on variant) allow connection to a wide range of devices such as radio modem, GPS unit, printer, or input from vehicle information/management systems. Simultaneous connection to several such devices is possible with the three port variant.

Build options

Two build options are available as standard products with either one or three RS232 ports and vehicle power input. The D-type connectors have screw locks. A total of four build variants are available:

Vehicle Cradle build variants	Power input details	
Number of Ports	12V vehicle power connector	Regulated 10V input via 15 way D type
1 RS232 Port (15 way D-type)	•	•
3 RS232 Ports (1 x 15 way D-type, 2 x 9 way D-type)	•	•

Note that the 10V power input versions must be built to order.

Power supply

Note that the unit accepts a 12v DC vehicle supply, and is not suitable for connection to 24v. In the case of a 24v or 36v vehicle, the power to the unit has to be taken from the vehicle's 12v rail, or a suitable DC/DC convertor or dropper/regulator has to be used.

The WVIC supplies enough current to charge a NiCd battery pack *and* run everything on the *Workabout* simultaneously, e.g. writing SSDs, backlight, powering port devices. The *Workabout* will not start draining the batteries as well as using power from the WVIC provided the supply is at least 11v DC.

Current consumption figures for a 3 port 12V WVIC are as follows (all figs in mA):

Configuration	Typical	Maximum	Notes
WVIC only	95	120	
WVIC + Workabout (off), no batteries	112	140	
WVIC + Workabout (off) + rechargeable pack	112	140	
WVIC + Workabout (on) + rechargeable pack	120	155	Application dependent
as above with VIC ports enabled and unloaded	140	160	
as above with ports all loaded	170	*	* Depends on what is connected
Additional current for backlight	44	50	

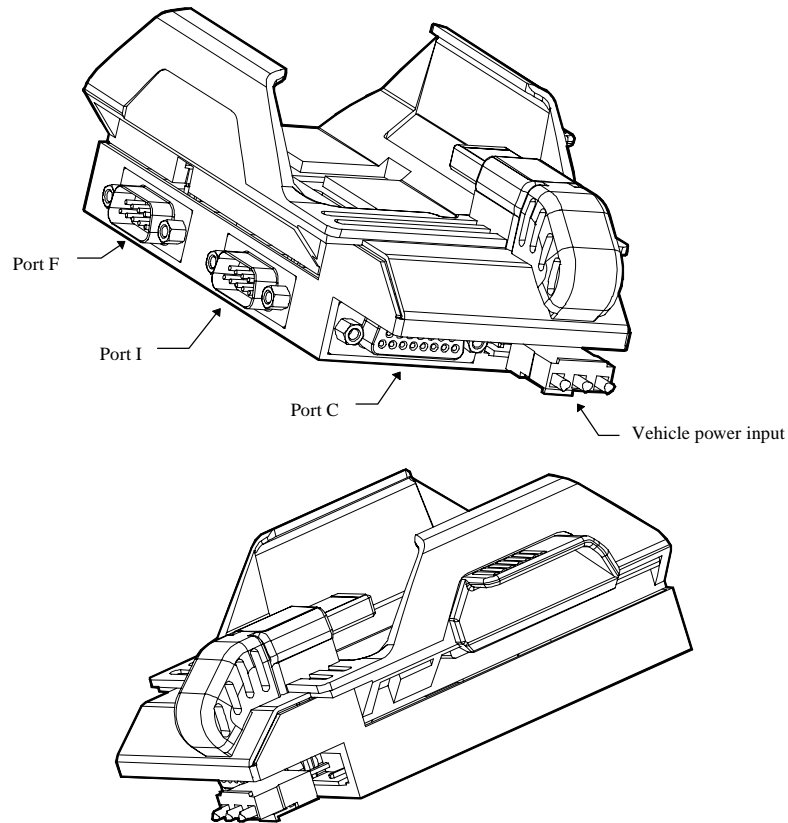
For peripherals connected to the *Workabout*, current consumption will depend on what the peripheral is.

For a 10V DC powered WVIC, 10mA should be deducted from the typical values, and 15mA should be deducted from the maximum values.

3 port and vehicle power input option

This variant of the WVIC (Psion part number 2800-0024) incorporates the following features:-

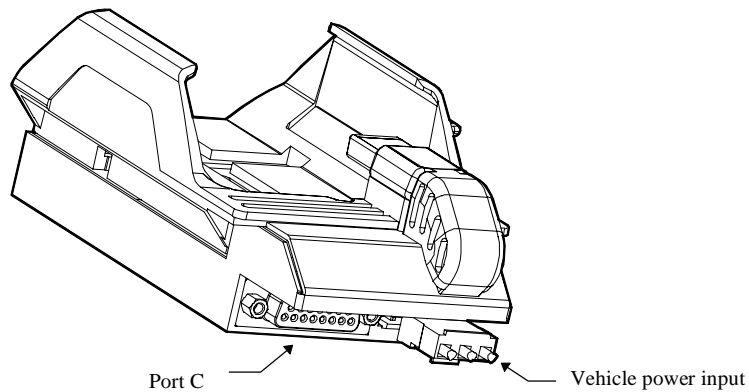
- Power input from the vehicle
- Surge suppression and regulation of the vehicle 12v supply to 10v DC
- Vehicle ignition switch sensing for *Workabout* wake up. Power down of the *Workabout* is available under application control.
- Conversion of Psion Fast Serial to RS232
- Trickle charge of the *Workabout* Ni-Cd rechargeable battery pack
- 2 RS232 ports - 9 way D-type with screw locks; 1 RS232 port - 15 way D-type with screw locks



1 port and vehicle power option

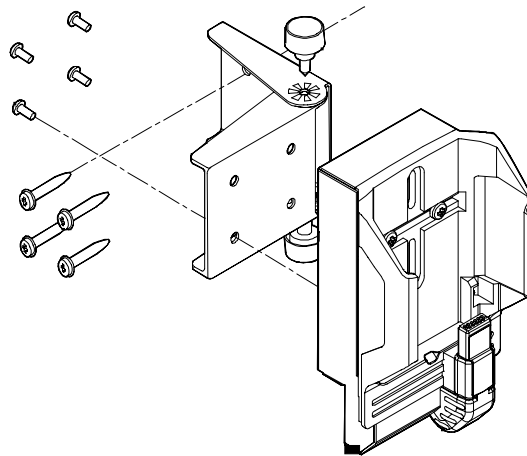
This variant of the WVIC (Psion part number 2800-0028) incorporates the following features:-

- Power input from the vehicle
- Surge suppression and regulation of the vehicle 12v supply to 10v DC
- Vehicle ignition switch sensing for *Workabout* wake up. Power down of the *Workabout* is available under application control.
- Conversion of Psion Fast Serial to RS232
- Trickle charge of the *Workabout* Ni-Cd rechargeable battery pack
- 1 RS232 port - 15 way D-type with screw locks

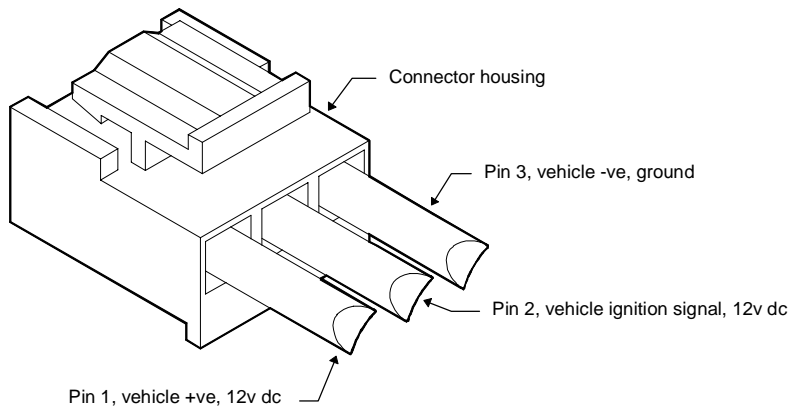


Mounting bracket

A mounting bracket (Psion Part number 2400-0082) is available for mounting both options of the Vehicle Cradle.



Vehicle power input connector



Pin Number	Function
1	Vehicle power in
2	Switched 12V in
3	Main ground.

The function of each pin is:

1. Main 12V DC input from the vehicle power supply is internally surge suppressed, and regulated to provide a 10V rail which then powers the *Workabout* connected to the LIF. This 10V rail is also used to drive a constant current source which supplies 83mA (nom.) to the BAT connection of the *Workabout* LIF socket, and hence to the internal Ni-Cd pack in a *Workabout*.
2. Switched 12V in is used to provide a wake-up signal to the *Workabout*. When this signal goes high, the *Workabout* will receive a high level on its EXON line in the LIF connector. This connection is optional - see Extended 15-way RS232 serial port details.
3. GND is the main ground return line for the vehicle power supply.

Conventional 9-pin RS232 serial ports

The unit has two 9-way D-type connectors (female), which provide the same RS232 signals to the outside worlds as are normally found on the RS232 connector of a *Workabout* RS232 expansion interface, with the addition of a further pin, described below. The connections are:

Pin Number	Function
1	DCD
2	RX (data in)
3	TX (data out)
4	DTR
5	Ground
6	DSR
7	RTS
8	CTS
9	RI (but see below)

The RI function is not directly supported by the serial port drivers on the *Workabout*; the state of the RI line can be read by the serial port driver on bit PA4 of the ASIC5.

These ports are accessed by the *Workabout* as standard serial devices, and are referred to as ports I and F. Port F is the closest of the two to the top of the unit when installed, and port I is that closest to the end of the unit holding the *Workabout* LIF connector.

Extended 15-way RS232 serial port

The unit has a further 15-way D-type connector at its bottom edge (adjacent to the 12V vehicle power connector). This provides the same functionality as the other two RS232 connectors (addressed as port C), as well as some extended functions, which are described below. The connections are:

Pin Number	Function	Pin Number	Function
		8	DSR
1	DCD	9	Ground
2	RX (data in)	10	RTS
3	TX (data out)	11	CTS
4	NC	12	RI (see below)
5	DTR	13	NC
6	External WakeUp (see below)	14	NC
7	Vin (see below)	15	NC

The RI function is not directly supported by the serial port drivers on the *Workabout*; the state of the RI line can be read by the serial port driver on bit PA4 of the ASIC5.

Pin 6, External WakeUp, is internally connected to pin 2 of the external 12V power connector, and can be used in the same manner to cause the *Workabout* to turn on when a voltage is presented on this pin. It can also be wired, in the users cable, to pin 8 (the DSR line) to provide a wake-up on reception of a DSR signal - this is the normal arrangement for Psion products with external wake-up signals. It follows that a connection from pin 6 to pin 8 **should not be made** at the same time as a connection to pin 2 of the external 12V input connector- this would result in the *Workabout* receiving wake up events at the wrong time, and could result in damage to the equipment connected to this port (though not to the VIC itself).

Vin expects a 250mA, 10V, 10% regulated positive DC voltage, and can be used to power the VIC and *Workabout*, as well as supplying charging current to the internal Ni-Cd pack. Internal circuitry allows for both this supply and the 12V vehicle supply to be present at the same time, although only one of them is necessary.

Psion LIF Connector

The Psion LIF connector details are covered in *Appendix A - Technical Specifications* of the *HC Programmers Reference* manual.

Psion Workabout Docking Station - Technical Specification

Introduction

The Workabout Docking Station is designed to provide a multi-function mounting point for the Psion Workabout corporate hand held computer, (referred to in this technical specification as *the computer*).

The Docking Station has the following features:

- Battery management, including fast charge of batteries (fast model)
- Small footprint
- Reliable connection between the Psion and the docking station using the LIF connector
- Option for in-vehicle use
- FCC, static and safety approval

Variants

A total of four build options available:

1. Workabout fast charge
2. Workabout trickle charge

Note: Both the above variants are also available with vehicle support circuitry on board.

This gives a total of 4 possible build variants.

Identification

PCB number and revision marked on PCB is common for all variants.

The main visual differences that distinguish The Workabout fast charger from the HC fast charger are:

Workabout fast charger:	2 pin 1.3mm DC jack fitted
HC fast charger:	4 pin bulky power supply socket fitted

Docking Station Unit

Main features

The Docking Station Unit has the following features:

- Fast charging of the computer internal battery pack, (fast model).
- Spare battery pack fast charging.
- Stable desktop mounting.
- Accepts some of the HC expansion modules which communicate via the Psion Fast Serial (PFS) protocol. These are accessible by any Workabout computer inserted into the Docking Station. See the table *Psion HC build variant and accessories matrix* at the end of *Appendix A - Technical Specifications* in the *HC Programmers Reference* manual for details.
- Data transfer from the computer, (with the appropriate expansion module and software driver).
- Simultaneous battery charging and data transfer, (if the Psion is not monitoring battery status).
- Wall mounting and bulk head fitting designed in.
- The battery compartment is factory configured to accept as standard the Workabout rechargeable battery pack.

Status indicators

There are several LEDs on the front of the charger unit to indicate the following:

- Communications/data transfer
- Yellow during data transfer
- Power status-On/Off
- Green when charger is connected to mains power
- Main computer battery charging status (Fast model only, see *Battery Status LED conditions*)
- Spare battery charging status (Fast model only, see *Battery Status LED conditions*)

Battery charging

The Docking Station has two charging modes:

- Normal
- Software controlled. See the *Cradle and Docking Station* chapter in the *I/O Devices Reference* manual.

If both the computer and the spare battery are fitted when the docking station is connected to mains power, charging priority will go to the spare battery. If the docking station is already connected to mains power, charging priority will go to whichever battery was plugged in first.

The computer main battery can be discharged before charging commences. This feature is controlled from the computer.

Note that the Slow Charge variant of the Docking station does not have a Battery Status LED. This is because it has only one status - charging.

Battery Status LED conditions

LED indication	Battery status
Flashing red	Preparation for fast charging (two seconds) or Battery condition outside specified range - trickle charging or For the battery pack inside the Psion: discharging under software control or Error
Steady red	Charging
Steady green	Charged
Flashing red/green	Waiting or For the battery pack inside the Psion: discharging under software control, while the spare is fast charging

Charging both battery packs

If a spare battery is inserted into the Docking Station whilst a battery pack inside the Psion is being charged, charging of the spare pack will begin after the internal battery pack has been charged.

If a Psion computer is inserted into the Docking Station whilst a spare battery pack is being charged, charging of the battery inside the Psion will begin after the spare pack has been charged.

If both the Psion and the spare battery pack are inserted into the Docking Station at the same time, (or both are in the Docking Station prior to it being connected to the mains), the packs will not be charged simultaneously. In the case of the Fast Charge variant of the Docking Station their respective LEDs will flash red for about two seconds, until the charger decides which battery pack to charge. The LED for the one charging then comes on red, and the other one's LED starts flashing red/green as it is waiting to be charged. For both Docking station variants the spare battery pack will normally be charged first.

Battery Fast Charging conditions

The Fast Charge variant of the Docking Station can Fast Charge in the following conditions:

Within the temperature range: 5 to 45 °C

Voltage of the battery pack: 1.8 to 3.8V DC for the *Workabout*.

If the battery pack temperature or voltage is outside the specified range, the charger trickle charges until the condition is within the allowable range, after which it will fast charge. A new or fully discharged battery pack (that has been left on for a long time) may have a voltage below the minimum for Fast Charging.

If the battery temperature is within the allowable range and the battery status LED continues to flash red it is likely that the battery pack is faulty.

Discharging prior to charging & capacity measurement

The Psion's internal battery pack may be discharged, under software control, prior to charging. This is not possible with the spare battery pack.

It is possible to charge the spare battery pack whilst discharging the main battery pack in the Psion.

Software controlled discharging of the battery pack leaves the voltage above the allowable minimum for subsequent Fast Charging.

Charging will automatically commence after the battery is discharged.

Under software control it is also possible to measure the actual capacity or the remaining capacity of the battery pack inside the Psion computer. The discharging current for the *Workabout* charger is 290mA \pm 5%.

Fast Charging times

A fully discharged battery pack takes approximately one hour to Fast Charge to 90-95% of its maximum capacity. If left in the Docking Station after this time it will be "topped-up" to its maximum capacity after a further two hours.

Slow Charging times

A fully discharged battery pack takes approximately 14 to 16 hours to Slow Charge to 100% of its maximum capacity.

Charging limitations

The Fast Charge and Slow Charge facilities only support the main Computer battery, not the battery of any attached peripheral. The HC Printer however, contains its own Quick Charge circuitry and may charge simultaneously under software control.

LIF Mounting Kit

The LIF mounting kit allows a LIF connector on the end of a cable to be fitted to a holster.

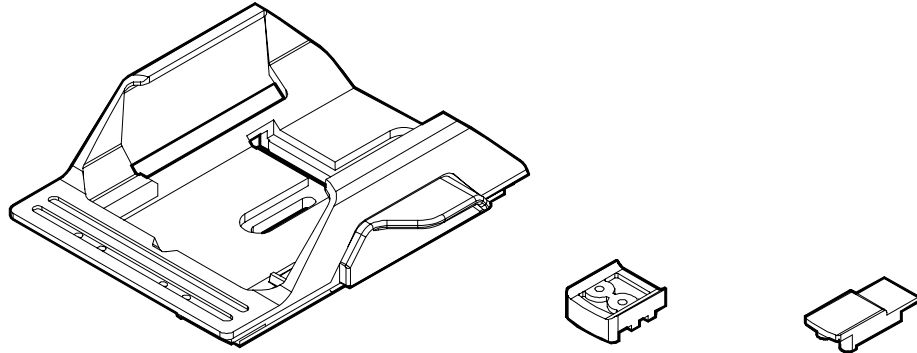
The holster itself is a plastic moulding into which the computer can be inserted. This incorporates a positive latching mechanism which holds the computer securely in place. The holster does not include any electronics.

The Clip cover and the 2 short screws that are fitted as standard to the LIF connector will need to be replaced with the blank cover and the 2 long screws supplied with the kit.

Workabout Holster with Socket Housing

The kit for the *Workabout* Computer consists of:-

- HC holster
- LIF connector support
- LIF connector blank front cover
- 2 screws - type K2.2 x 12 mm CSK (not shown)

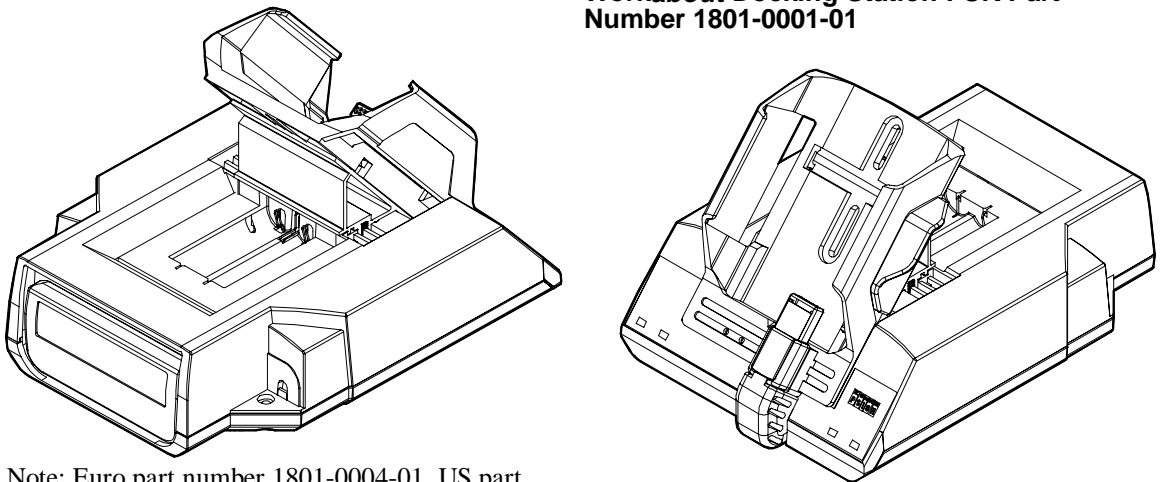


Workabout Docking Station

This is a Fast Charger with serial data communication capabilities supplied with a factory fitted *Workabout* holster, also known as a *Workabout* Docking Station. The cable from the hardware board to the LIF connector is protected by an over-moulded rubber grommet.

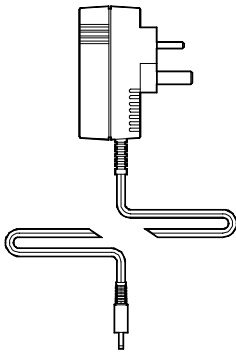
A 12v 1 amp unregulated power supply is supplied with the docking station.

Workabout Docking Station : UK Part Number 1801-0001-01



Note: Euro part number 1801-0004-01, US part number 1801-0005-01

12V 1 amp unregulated Power Supply : UK Part Number 2300-0197-01



Note: Euro part number 2300-0210-01, US part number 2300-0211-01

APPENDIX B

DIFFERENCES BETWEEN

THE HC COMMAND PROCESSOR,

THE *WORKABOUT* COMMAND PROCESSOR

AND MS-DOS

Introduction

About this appendix

This appendix compares the Psion HC Command Processor commands with the commands of the *Workabout* Command Processor and the MS-DOS Command Processor. It is provided for two purposes:

- So that developers may easily convert batch programs written for the Psion HC into batch programs that will run on the *Workabout*.
- So that developers familiar with writing MS-DOS batch programs may easily find the similarities and differences relating to writing batch programs for the Psion HC and the *Workabout*.

It is not the purpose of this appendix to give the full syntax of MS-DOS commands, and `<etc>` may be used to indicate an incomplete syntax statement, (refer to your MS-DOS manual or MS-DOS Help). Furthermore MS-DOS is available in many versions. At the time of writing the current version was 6.2. Commands that are only for use in MS-DOS *config.sys* files have not been included if they have no relevance to Psion machines.

Help

Help about commands, (and other features of the machine), is not available from the system on the Psion HC, but is on the *Workabout*. Help is also available in current versions of MS-DOS.

Commands

Shortened versions of commands are **not** available on the *Workabout* (or in MS-DOS). For example, `com` is not an acceptable shortened form of `COMMAND`. The *Workabout* Command Processor thus differs from the Psion HC Command Processor which does allow command abbreviations. Where the full length HC command is longer than the *Workabout* command the extra HC characters are enclosed in braces, `{ }`, in the heading. Optional characters for an HC command are enclosed in square brackets, `[]`, in the syntax statement.

File and directory names

Psion computers allow the use, for example, of the "+" character in filenames, which is not allowed in MS-DOS, (see the `COPY` command).

On the *Workabout* a trailing backslash can generally be used to clarify that a name is a directory rather than a file, whereas on an HC, (as in DOS), a parsing error may occur. For example, if the current drive is *m:* and the current directory is *\img* the command:

```
md tools\
```

will successfully create a directory on the *Workabout*, but not on the HC.

In all, fully specified Psion filenames (`filespec`) are regarded as having *five* parts:

1. A *filing system* (e.g. *loc.:* or *rem.:*).
2. A *drive or device* (e.g. *b:*).
3. A *path* (e.g. ** or *\accounts\jan*).
4. A *filename* (e.g. *job*).
5. An *extension* (e.g. *.img*).

In MS-DOS the file specification syntax `\\server\` is analogous to the Psion *filing system* component.

Wildcards

The use of `*` differs from its use in DOS in that, on the HC and the *Workabout*, it is possible to use, for example:

```
a*b.*
```

to select all files whose file name starts with *a* and ends with *b*. In DOS, `a*b.*` has the same effect as `a*.*`.

Batch files

Batch files may only be run synchronously on the *Workabout*, (as in DOS), or on an HC. On the HC preceding the name of the batch file by `@` is required, but not on the *Workabout*. In *Workabout* batch files `@` suppresses echo, just like in DOS.

On the *Workabout* batch files must have the extension *.btf*, (just as DOS batch files must have the extension *.bat*), but on the HC other extensions (though not advisable) **are** allowed. The *Workabout* stores batch files, by default, in a *\btf* directory. The HC has no default directory for batch files, (neither do DOS machines).

On the HC it is not possible to pass parameters to a batch file, but on the *Workabout* you can pass as many parameters as will fit on the command line, (like DOS). *Workabout* batch files can also use `IF...GOTO...` constructs, unlike HC batch files, (but like DOS ones).

Default directory structure

On the *Workabout* there is a fixed default directory structure, into which files with specific extensions are placed. This directory structure is searched automatically for program files if full details are not provided of path and filename extension. The HC does not have a default directory structure, (neither do DOS machines).

Launching programs

The *Workabout* looks for filenames in the following order of extensions, if no extension is given:

1. *.img*
2. *.app*
3. *.opo*
4. *.opa*
5. *.btf*

The order of searching on the *Workabout* is described in detail in the chapter *The Workabout Command Processor*.

The HC, on the other hand, looks for filenames in the following order of extensions, if no extension is given:

1. *.opo*
2. *.img*
3. *.app*

The order of searching on the HC is described in detail in the chapter *The HC Command Shell* in the *HC Programmers Reference* manual.

DOS machines do not have fixed search orders, and search paths must be specified using the `PATH` command.

Memory resident programs

The *Workabout* (or any other Psion SIBO machine) can have programs running asynchronously in the background, (see the *HC Programmers Reference*, *Series 3 Programmers Reference* and *Workabout Programmers Reference* manuals). An example of this is the LINK program. In contrast MS-DOS has Terminate and Stay Resident programs (TSRs) which are installed into memory (usually on boot up) but cannot run until control is passed to them, (MS-DOS is not multi-tasking).

Alphabetical listing

APPEND Append directories to current data path

HC Command Processor

Not supported.

Workabout Command Processor

Applications each have their own preferred path for data files. See the *Default location of files* section of the chapter *The Workabout Command Processor* in the *Workabout Programmers Reference* manual.

MS-DOS Command Processor

APPEND <etc>

Enables programs to open data files in specified directories as if the files were in the current directory.

ATTRIB{UTE} Set or clear file attributes

Note that the `a` flag on the *Workabout* or PC is exactly the same as the `m` flag on the Psion HC.

HC Command Processor

ATT[RIBUTE] [system:][drive:][path]filename.extension [+h|-h] [+s|-s] [+m|-m] [+r|-r]

Sets or resets the hidden (h), system (s), modified (m) and/or read-only (r) attributes of a file.

A filename must be given. If all four attributes are omitted nothing will happen.

The command **does not** accept a wild card specification.

Workabout Command Processor

ATTRIB [system:][drive:][path][filename][.extension] [+h|-h] [+s|-s] [+a|-a] [+r|-r]

Sets or resets the hidden (h), system (s), archive (a) and/or read-only (r) attributes of a file.

If all four attributes are omitted, `attrib` displays the existing settings.

If the filename is also omitted then the attributes of **all** files in the current (or specified) path are displayed.

The command **does** accept a wild card specification.

MS-DOS Command Processor

```
ATTRIB [drive:][path]filename.extension [+h|-h] [+s|-s] [+a|-a] [+r|-r] [/s]
```

Sets or resets the hidden (h), system (s), archive (a) and/or read-only (r) attributes of a file. The /s switch processes the current directory and all related subdirectories.

If all four attributes are omitted, `attrib` displays the existing settings.

If the filename and attributes are omitted then the attributes of the specified directory **only** are displayed.

If both path and filename are omitted the attributes of all files in the current directory are displayed.

The command **does** accept a wild card specification.

AUTO**Set time to auto-switch-off****HC Command Processor**

```
AUT[O] seconds
```

Sets the time for auto-switch-off.

Workabout Command Processor

Implemented via `SETDEF`.

MS-DOS Command Processor

Not supported.

BACKLIGHT**Set backlight time-out****HC Command Processor**

```
BACK[LIGHT] [time]
```

Sets the backlight auto-time-out to `time`, or if `time` is omitted, displays the current setting (in hexadecimal).

Workabout Command Processor

Implemented via `SETDEF`, (or system interface menus).

MS-DOS Command Processor

Some screen savers provide similar functionality.

BACKUP**Backup files****HC Command Processor**

Files are backed up to a PC using MCLINK, RCom or PsiWin.

Workabout Command Processor

Files are backed up to a PC using MCLINK, RCom or PsiWin.

MS-DOS Command Processor

```
BACKUP <etc>
```

Backs up files from one disk to another, (MS-DOS versions 2.0 to 5.0).

BATCHK**Start battery check program****HC Command Processor**

```
BATCHK interval
```

Starts the program `rom::batchk` (if found), which monitors the voltages of the main and backup batteries.

Workabout Command Processor

Replaced by Shift-Ctrl-B.

MS-DOS Command Processor

Not supported.

BATTERY Specify battery type**HC Command Processor**

BAT[TERY] type

Specifies which type of main battery is installed.

Workabout Command Processor

Replaced by Shift-Ctrl-B.

MS-DOS Command Processor

Not supported.

BREAK Control extended CTRL-C checking**HC Command Processor**

Not supported. This is not relevant to Psion machines.

Workabout Command Processor

Not supported. This is not relevant to Psion machines.

MS-DOS Command Processor

BREAK [ON|OFF]

Sets or clears extended CTRL-C checking.

CALC Run the calculator application

External command.

HC Command Processor

Not supported.

Workabout Command Processor

[START] CALC

Run the Calculator application, Calc.

MS-DOS Command Processor

Not supported, although calculator programs are available.

CALL Call a batch file from inside another batch file

Call a batch file from inside another batch file.

HC Command Processor

No command is required. The filename prefixed with an @, is all that is needed.

@[system:][drive:][path]batchfile[.extension]

Psion HC batch files always return to any calling batch file on completion.

Workabout Command Processor

[CALL][system:][drive:][path]batchfile[.extension] [batch-parameters]

Omitting the CALL command and just using the file specification "chains" the named batch file, and it then does not return to the calling batch file on completion.

MS-DOS Command Processor

[CALL][drive:][path]batchfile [batch-parameters]

Omitting the CALL command and just using the file specification "chains" the named batch file, and control then does not return to the calling batch file on completion.

CD **Display or alter current directory**

Changes to a different path, or (if `path` is omitted) displays the current path. This is exactly the same as `CHDIR`.

HC Command Processor

```
CD [drive:][path]
```

Use `CD [drive:]\` to change to the root directory of a drive.

The HC maintains one machine-wide path.

Workabout Command Processor

```
CD [drive:][path]
```

Use `CD [drive:]\` to change to the root directory of a drive.

The *Workabout* maintains one path per local drive, plus a "current drive". To change drive use:

```
drive:
```

MS-DOS Command Processor

```
CD [drive:][path]      or
```

```
CD [...]              to change to the parent directory
```

Use `CD [drive:]\` to change to the root directory of a drive.

MS-DOS maintains one path per drive, plus a "current drive". To change drive use:

```
drive:
```

CHCP **Display or change character set****HC Command Processor**

Not supported.

Workabout Command Processor

Psion-K can be used to switch the character set available from the keyboard.

MS-DOS Command Processor

```
CHCP [nnn]
```

Displays or changes the active character set.

CHDIR **Display or alter current directory**

Changes to a different path, or (if `path` is omitted) displays the current path. This is exactly the same as `CD`.

HC Command Processor

The `CD` command is used instead.

Workabout Command Processor

```
CHDIR [drive:][path]
```

Use `CHDIR [drive:]\` to change to the root directory of a drive.

The *Workabout* maintains one path per local drive, plus a "current drive". To change drive use:

```
drive:
```

MS-DOS Command Processor

```
CHDIR [drive:][path]      or
```

```
CHDIR [...]              to change to the parent directory
```

Use `CHDIR [drive:]\` to change to the root directory of a drive.

MS-DOS maintains one path per drive, plus a "current drive". To change drive use:

```
drive:
```


CHKDSK**Check or fix disk****HC Command Processor**

This is not relevant to HC machines.

Workabout Command Processor

The "Disk info" option of the "Info" menu in the System Screen gives information such as: the disk's label, its capacity, the amount of used space and the amount of free space. The VOL command also returns this information.

MS-DOS Command Processor

CHKDSK <etc>

Checks and displays disk status, or may be used to fix a disk.

CHOICE**Prompt user for choice****HC Command Processor**

Not supported.

Workabout Command Processor

Not supported.

MS-DOS Command Processor

CHOICE <etc>

Prompts the user to make a choice in batch programs. MS-DOS 6.0 onwards.

CLS**Clear the screen**

Clears the screen, leaving the > prompt and cursor in the top left corner.

HC Command Processor

Not supported.

Workabout Command Processor

CLS

MS-DOS Command Processor

CLS

COMMAND**Start another command processor instance****HC Command Processor**

Not supported. See the *HC Programmers Reference* manual.

Workabout Command Processor

Not required, because the Command Processor can start many processes asynchronously.

MS-DOS Command Processor

COMMAND <etc>

Starts another instance of the command processor (shell).

COMMS **Run the communications application**

External command.

HC Command Processor

Not available.

Workabout Command Processor

```
[START] COMMS [system::][drive:][path][filename[.extension]]
```

Run the communications application, Comms.

MS-DOS Command Processor

The `INTERLNK` command does similar things, as do many other proprietary programs.

COMP **Compare two files****HC Command Processor**

Not available.

Workabout Command Processor

Not available.

MS-DOS Command Processor

```
COMP <etc>
```

Compares two files and lists the differences between them. External command, up to MS-DOS 5, (c.f. `FC` in MS-DOS 6 onwards).

CONFIG **Set language file****HC Command Processor**

```
CON[FIG] filename
```

Changes the language data file to that specified. If `filename` is omitted, the effect is to revert to the file `sys$ctry.cfo`.

Workabout Command Processor

Implemented via the `SETDEF` command, (or the system interface menus).

MS-DOS Command Processor

Not supported. The `COUNTRY` command in `config.sys` does similar things.

COPY **Copy file(s)**

Copies one or more files, possibly changing their names in the process.

HC Command Processor

```
COP[Y] source destination
```

The `source` and `destination` file specifications can consist of a system and double colon, drive letter and colon, a directory name, a filename, or a combination of these.

Several files **cannot** be combined into one file by using wildcards.

Workabout Command Processor

```
COPY source destination [/s] [/y]
```

The `source` and `destination` file specifications can consist of a system and double colon, drive letter and colon, a directory name, a filename, or a combination of these.

The `/s` switch allows copying of subdirectories.

The `/y` switch allows overwriting without confirmation, (as in MS-DOS 6.xx).

Several files **cannot** be combined into one file by using wildcards.

MS-DOS Command Processor

```
COPY [/Y|/Y] [/A|/B] source [/A|/B] [+ source [/A|/B] [+...]][destination [/A|/B]] [/V]
```

The `source` and `destination` file specifications can consist of a drive letter and colon, a directory name, a filename, or a combination of these.

By using wildcards or the `[+ source [/A|/B] [+...]]` syntax, several files **can** be combined into one file.

COUNTRY**Set country****HC Command Processor**

Not supported. The `CONFIG` command does similar things.

Workabout Command Processor

Not supported. The `SETDEF` command sets which language file to use.

MS-DOS Command Processor

```
COUNTRY=nnn <etc>
```

Sets country-specific conventions in `config.sys`. Date and time formats are set in the country file.

CTTY**Change terminal device****HC Command Processor**

Use the Psion SIBO Debugger, which provides similar functionality.

Workabout Command Processor

Use the Psion SIBO Debugger, which provides similar functionality.

MS-DOS Command Processor

```
CTTY device
```

Change terminal device.

D**Brief directory listing****HC Command Processor**

```
D [/p] [filespec]
```

Lists specified filenames in a directory, without any additional information except for the total size and the total number of bytes free on the current device.

Workabout Command Processor

The `DIR` command has a switch (`/b`) for bare output of filenames only.

MS-DOS Command Processor

The `DIR` command has many switches to format directory listing output.

DATA**Run the database application**

External command.

HC Command Processor

Not available.

Workabout Command Processor

```
[START] DATA [system:][drive:][path][filename[.extension]]
```

Run the database application, Data.

MS-DOS Command Processor

Not available, though there are many proprietary programs on the market.

DATE **Display date [and time]****HC Command Processor**

DATE [E]

Displays the current date **and time**, in the format:

```
day/d[d]/mth/yyyy hh:mm:ss
```

For example:

```
Thu/12/Oct/1995 16:59:59
```

will be displayed if the current system date and time is Thursday 12 October 1995, and it is one second before five o'clock in the afternoon.

If the day of the month has only a single digit, no leading zero is displayed. One minute past noon on the first day of January 1996 is displayed as:

```
Mon/1/Jan/1996 12:01:00
```

The date must be set with SETDAT.

Workabout Command Processor

DATE

Displays the current date in the default format, or the format specified by the most recent SETDEF or menu command.

The default display format is:

```
dd/mm/yy
```

For example 12/10/95 will be displayed if the current system date is 12 October 1995.

If the day of the month or the month number itself has only a single digit, a leading zero is displayed. The first day of January 1996 is displayed as:

```
01/01/96
```

The date must be set from the menus. See TIME for displaying the system time.

MS-DOS Command Processor

DATE [mm-dd-yy]

Displays the current date, and prompts for it to be changed. Otherwise sets the date.

DBLSPACE **Compress a disk****HC Command Processor**

Not supported. This is not relevant to Psion computers.

Workabout Command Processor

Not supported. This is not relevant to Psion computers.

MS-DOS Command Processor

DBLSPACE

Compresses data on hard or floppy disks.

DEBUG**Start the debug program****HC Command Processor**

The Psion SIBO debugger offers similar functionality.

Workabout Command Processor

The Psion SIBO debugger offers similar functionality.

MS-DOS Command Processor

```
DEBUG
```

Starts the debug program to allow debugging of executable files.

DEFRAG**Optimise files on a disk****HC Command Processor**

Use the `COMPRESS` command in Psion RCom or a "Compress..." option in PsiWin.

Workabout Command Processor

Use the `COMPRESS` command in Psion RCom or a "Compress..." option in PsiWin.

MS-DOS Command Processor

```
DEFRAG <etc>
```

Reorganises files on a disk to optimise disk performance.

DEL{ETE}**Delete file(s)**

Deletes the specified file or files.

HC Command Processor

```
DEL[ETE] filespec
```

Workabout Command Processor

```
DEL filespec [/s] [/y]
```

or

```
ERASE filespec [/s] [/y]
```

If the `/s` flag is used, all subdirectories and files are deleted.

If the `/y` flag is used, no confirmation is asked for. This is intended for use in batch files.

Note that, like in MS-DOS, confirmation is not asked for if a **single** file is being deleted. Unless `/y` is used, confirmation is always asked for if all files in a directory are being deleted.

MS-DOS Command Processor

```
DEL filespec [/p]
```

or

```
ERASE filespec [/p]
```

If the `/p` flag is used, prompts for confirmation before deleting a specific file.

The `DELTREE` command is used to delete subdirectories and their files.

DELTREE Delete a directory, subdirectories and files**HC Command Processor**

Not available.

Workabout Command Processor

Use:

```
DEL filespec /s
```

or

```
ERASE filespec /s
```

MS-DOS Command Processor

```
DELTREE <etc>
```

Deletes a specified directory and all subdirectories and files.

DEVICE List devices

The Psion HC command performs a completely different function to the MS-DOS command.

HC Command Processor

```
DEV[ICE] [filespec]
```

Lists all devices ("drives") in the filing system specified by *filespec*.

Workabout Command Processor

Re[placed by LLDEV and LPDEV.

MS-DOS Command Processor

Loads a device driver. This is a *config.sys* command.

```
DEVICE filespec <etc>
```

However the MEM command provides similar functionality.

DIR Full directory listing

Lists all the specified files in a directory, together with their sizes, the time and date of their last modification, and their attributes.

HC Command Processor

```
DIR [/p] [filespec]
```

The */p* flag causes the display to pause at the end of each screen.

Workabout Command Processor

```
DIR [drive:] [path] [filespec] [/s] [/b]
```

The listing pauses automatically after each screen of information, prompting the user to press enter to continue, (except in batch files).

The */s* flag causes all subdirectories to be listed as well.

The */b* flag causes bare output to be used, (filenames only).

MS-DOS Command Processor

```
DIR [drive:] [path] [filespec] <etc>
```

DISKCOMP**Compare two floppy disks****HC Command Processor**

Not available.

Workabout Command Processor

Not available.

MS-DOS Command Processor

DISKCOMP <etc>

Compares two floppy disks.

DISKCOPY**Copy a floppy disk****HC Command Processor**

Not available.

Workabout Command Processor

Use `COPY *.* /S` (note that this does not format the target disk).
Also available via a System Screen menu option for SSDs.

MS-DOS Command Processor

DISKCOPY <etc>

Copies a floppy disk. The target disk is formatted first.

DOSKEY**Load/start DOSKEY program****HC Command Processor**

Not available.

Workabout Command Processor

This functionality is built-in.

MS-DOS Command Processor

DOSKEY [<etc>]

Load/start the DOSKEY program.

DOSSHELL**Load DOSSHELL graphical interface****HC Command Processor**

Not available.

Workabout Command Processor

Not available. The System Screen carries out similar functions to the MS-DOS Shell.
This may be loaded directly from the Startup Shell, or by entering:

```
start sys$gsys
```

in the Command Processor.

MS-DOS Command Processor

DOSSHELL <etc>

Loads the MS-DOS Shell graphical interface.

ECHO **Display message, set or display echo mode**

Displays the message `text`, or sets the echo mode in batch files, or displays the current echo mode.

HC Command Processor

Not supported.

Workabout Command Processor

```
ECHO [[text]][ON | OFF]
```

MS-DOS Command Processor

```
ECHO [[text]][ON | OFF]
```

EDIT **Run file editor****HC Command Processor**

Not supported.

Workabout Command Processor

```
[START] EDIT [system:][drive:][path][filename][.extension]
```

Runs the Psion file editor, which also translates and runs programs as determined by the source file extension.

MS-DOS Command Processor

```
EDIT <etc>
```

Runs the MS-DOS text file editor. This is an external command.

EMM386 **Enable expanded memory****HC Command Processor**

This is not relevant to Psion computers.

Workabout Command Processor

This is not relevant to Psion computers.

MS-DOS Command Processor

```
EMM386 <etc>
```

Enable EMM386 expanded memory.

ENV **Display, set or delete environment variable****HC Command Processor**

```
ENV [[var=[value]][varspec]]
```

Displays or sets the value of environment variables, or deletes them.

Workabout Command Processor

Not supported.

The `SET` command, which is exactly equivalent, must be used instead.

MS-DOS Command Processor

Not available. The `SET` command is used instead.

ERASE**Delete file(s)****HC Command Processor**

Not supported.

`DEL [/E]` must be used instead.

Workabout Command Processor

```
ERASE [drive:] [path] filespec [/s] [/y]
```

Deletes the specified file or files.

The command `DEL filespec [/s] [/y]` is exactly the same as `ERASE`.

MS-DOS Command Processor

```
ERASE [drive:] [path] filespec [/p]
```

Deletes the specified file or files.

The command `DEL filespec [/p]` is exactly the same as `ERASE`.

ERRLEVEL**Display error level**

Display the error level.

HC Command Processor

Not supported.

Workabout Command Processor

```
ERRLEVEL
```

Display the error level state (`TRUE` or `FALSE`).

MS-DOS Command Processor

Not supported.

ERRORLEVEL**Error level value**

`ERRORLEVEL` is not a command. It is the status of the last command that was executed.

HC Command Processor

Not supported.

Workabout Command Processor

```
ERRORLEVEL
```

Holds the error level value, (it is a Boolean value, `TRUE` or `FALSE`). Unlike DOS, Command Processor commands set `ERRORLEVEL` as applicable. The general use of `ERRORLEVEL` is in an `IF` statement:

```
IF [NOT] ERRORLEVEL command
```

Thus, for example, within a batch file, you can test for a directory, as follows:

```
CHDIR \INC
IF ERRORLEVEL MD \INC
CHDIR \INC
```

MS-DOS Command Processor

```
ERRORLEVEL
```

Holds the error level number (an integer in the range 0 to 255). An example of its use is:

```
IF [NOT] ERRORLEVEL number command
```

EXIT**Exit level****HC Command Processor**`EXIT [T]`

Exits the Command Shell. May be used to terminate second copies of the Command Shell that are no longer required.

If the `EXIT` command is typed into the first copy of the Command Shell, the HC will automatically re-launch a shell process, as explained in the *Introduction to the HC* chapter of the *HC User Reference* manual.

If the `EXIT` command is found in a batch file, all that happens is that the batch file is terminated, and control passes back to the previous level of batch file (or to the command line). See the Workabout Command Processor `QUIT` command.

Workabout Command Processor`EXIT`

Present a dialog offering options to terminate the Command Processor or cancel the command.

On confirmation of an `EXIT` command typed directly into the Command Processor (or of the selection of the Exit option from the Special menu) the Command Processor is terminated. If there is no other task running on the machine, the *Workabout* will then automatically bring the Startup Shell process to foreground, as explained in the chapter *Introduction to the Workabout*. If one or more other tasks are running, the machine will switch tasks to whichever running application was last used.

If the `EXIT` command is executed from a (nested) batch file, all levels of batch processing are terminated immediately and the confirmation dialog presented. On confirming the `EXIT` command, the Command Processor terminates in the same way as when `EXIT` is typed directly into the Command Processor.

MS-DOS Command Processor`EXIT`

Terminates the Command Processor.

If the `EXIT` command is found in a batch file, all levels of batch processing are terminated. The Command Processor terminates in the same way as when `EXIT` is typed directly into the Command Processor.

EXPAND**Expand a compressed file****HC Command Processor**

Not available.

Workabout Command Processor

Not available.

MS-DOS Command Processor`EXPAND <etc>`

Expand a compressed file.

FASTHELP**Get summary Help on command syntax****HC Command Processor**

Not available.

Workabout Command Processor

Not available. Use `HELP [command]`

MS-DOS Command Processor

FASTHELP [command]

or

[command] /?

Gets summary Help as a listing of (all) command(s) and syntax.
MS-DOS 6 onwards, (it is the same as HELP in MS-DOS 5)

FASTOPEN**Start FASTOPEN program****HC Command Processor**

Not available. This is not relevant to Psion computers.

Workabout Command Processor

Not available. This is not relevant to Psion computers.

MS-DOS Command Processor

FASTOPEN <etc>

Starts the FASTOPEN program.

FC**Compare two files****HC Command Processor**

Not available.

Workabout Command Processor

Not available.

MS-DOS Command Processor

FC <etc>

Compares two files and lists the differences between them. External command, MS-DOS 6 onwards, (c.f. COMP in MS-DOS 5).

FCBS**Specify number of file control blocks****HC Command Processor**

Not available. This is not relevant to SIBO machines.

Workabout Command Processor

Not available. This is not relevant to SIBO machines.

MS-DOS Command Processor

FCBS <etc>

Specifies the number of file control blocks (FCBs) that can be open at any one time. Used in *config.sys* files only.

FDISK**Partition a hard disk****HC Command Processor**

Not available. This is not relevant to SIBO machines.

Workabout Command Processor

Not available. This is not relevant to SIBO machines.

MS-DOS Command Processor

FDISK <etc>

Starts the MS-DOS FDISK program to partition a hard disk. This is an external command.

FILES **List open files/Specify number of files accessible**

This command is completely different for MS-DOS and SIBO machines.

HC Command Processor

Not available.

Workabout Command Processor

`FILES drive:`

Returns the names of all open files on the specified drive.

The program using each file, the process number and the full filename including the path are given.

MS-DOS Command Processor

`FILES=x`

Specifies the number of files MS-DOS can access at one time. Used in *config.sys* files only.

Some networks provide a functionality similar to the Workabout `FILES` command.

FIND **Find a text string in a file or files****HC Command Processor**

Not available.

Workabout Command Processor

Not supported.

MS-DOS Command Processor

`FIND <etc>`

Searches for a specified text string in a file or files.

FOR **Run a command for the files in a set**

Run a command for each file in a specified set of files.

HC Command Processor

Not supported.

Workabout Command Processor

`FOR [%]variable IN (set) DO command [parameters]`

The extra % is needed in batch programs.

MS-DOS Command Processor

`FOR [%]variable IN (set) DO command [parameters]`

The extra % is needed in batch programs.

FORMAT **Format device**

Formats a disk in the specified drive.

The disk may be labelled with a volume name (label), `volname`

HC Command Processor

`FOR[MAT] [drive:][volname]`

Workabout Command Processor

`FORMAT [drive:][volname]`

If the label `volname` is not specified, any existing label is retained.

MS-DOS Command Processor

```
FORMAT <etc>
```

If the label is not specified, any existing label is deleted.

FREE**Display free memory****HC Command Processor**

```
FRE[E]
```

Displays the amount of free RAM in kilobytes.

Workabout Command Processor

The `MEM` command performs a similar function.

MS-DOS Command Processor

The `MEM` command performs a similar function.

GOTO**Jump to label in batch file**

Jump to the label `label` in a batch file. A label in a batch file occurs at the start of a line (preceded by a colon, `:`). It is not the same thing as the label mentioned in the `FORMAT` and `LABEL` command descriptions.

HC Command Processor

Not supported.

Workabout Command Processor

```
GOTO label
```

MS-DOS Command Processor

```
GOTO label
```

GRAPHICS**Load program to allow printing of colour screen****HC Command Processor**

Not available. The HC has black and white graphics by default.

Workabout Command Processor

Not available. The *Workabout* has black, grey and white graphics by default.

MS-DOS Command Processor

```
GRAPHICS <etc>
```

Loads a program to allow the printing of information displayed on a colour screen. Used in *config.sys* files only.

HELP**List commands or get help**

List commands or get help on a specific command.

HC Command Processor

Not supported.

Workabout Command Processor

```
HELP [command]
```

MS-DOS Command Processor

```
HELP [command]
```

IF **Run command conditionally**

A command is run depending on one of three possible specified conditions. See also `ERRORLEVEL`.

HC Command Processor

Not supported.

Workabout Command Processor

```
IF [not] {ERRORLEVEL | string1==string2 | EXIST filespec} command [command_parameters]
```

The file specification can consist of a system and double colon, drive letter and colon, a directory name, a filename, or a combination of these.

MS-DOS Command Processor

```
IF [not] {ERRORLEVEL nn| string1==string2 | EXIST [[drive:]path]filename} command
```

INSTALL **Install memory resident program****HC Command Processor**

Not supported. SIBO computers are multi-tasking, so can have many programs running at the same time. Use `&progname` in a batch file for a similar effect to MS-DOS `INSTALL`.

Workabout Command Processor

Not supported. SIBO computers are multi-tasking, so can have many programs running at the same time. Use the `START` command in a batch file for a similar same effect to MS-DOS `INSTALL`.

MS-DOS Command Processor

```
INSTALL [drive:][path]filename [command-parameters]
```

Installs a memory resident program when MS-DOS is started up. Can only be used in `config.sys` files.

INTERLNK **Connect two computers to share resources****HC Command Processor**

Use `LINK` and `MCLINK` or `RCom`, or `PsiWin`.

Workabout Command Processor

Use `LINK` and `MCLINK` or `RCom`, or `PsiWin`.

MS-DOS Command Processor

```
INTERLNK [client[:]=[server][:]]
```

Connects two computers using Interlink. MS-DOS 6.0 onwards.

INTERSVR **Start the Interlink server****HC Command Processor**

Use `LINK` and `MCLINK` or `RCom`, or `PsiWin`.

Workabout Command Processor

Use `LINK` and `MCLINK` or `RCom`, or `PsiWin`.

MS-DOS Command Processor

```
INTERSVR <etc>
```

Starts the Interlink server. MS-DOS 6.0 onwards.

KEYB **Configure keyboard for language****HC Command Processor**

Not supported.

Workabout Command Processor

Use `SETDEF` to set the keyboard, (or the system interface menu option).

MS-DOS Command Processor

```
KEYB <etc>
```

Configures the keyboard for a particular language.

KILL **Kill a process**

Kills the first process found matching the specification in `procname`. **Emergency use only.** See `STOP`.

HC Command Processor

```
KIL[L] procname
```

Workabout Command Processor

```
KILL procname [/y]
```

If the `/y` flag is used, no confirmation is asked for. This is intended for use in batch files.

MS-DOS Command Processor

Not supported.

LABEL **Add/alter disk volume label**

Creates, changes or deletes the label on an SSD/disk in the specified `drive`, (using the label `name`).

HC Command Processor

Not supported.

Workabout Command Processor

```
LABEL [drive:][name]
```

MS-DOS Command Processor

```
LABEL [drive:][name]
```

LASTDRIVE **Specify maximum number of drives****LDEV** **List device drivers**

Lists all specified logical and physical device drivers.

HC Command Processor

```
LDEV [device_spec]
```

Workabout Command Processor

There are separate commands to list logical and physical device drivers, `LLDEV` and `LPDEV`.

MS-DOS Command Processor

Not supported. The `MEM` command provides a similar function.

LH **Load program into upper memory****HC Command Processor**

Not relevant to SIBO machines.

Workabout Command Processor

Not relevant to SIBO machines.

MS-DOS Command Processor

LH <etc>

Load a program into the upper memory area, or into a specified region or regions of upper memory. This is the same as `LOADHIGH`.

LLDEV **List logical device drivers**

Lists all specified logical device drivers.

HC Command Processor

The `LDEV` command lists both physical and logical device drivers.

Workabout Command Processor

LLDEV [device_spec]

The list includes all ROM-resident device drivers, as well as external ones that are currently loaded.

MS-DOS Command Processor

Not supported. The `MEM` command provides a similar function.

LOADFIX **Load and run program above first 64K block****HC Command Processor**

Not relevant to SIBO machines.

Workabout Command Processor

Not relevant to SIBO machines.

MS-DOS Command Processor

LOADFIX <etc>

Loads a program into memory above the first 64KB block of conventional memory, and runs it.

LOADHIGH **Load program into upper memory****HC Command Processor**

Not relevant to SIBO machines.

Workabout Command Processor

Not relevant to SIBO machines.

MS-DOS Command Processor

LOADHIGH <etc>

Loads a program into the upper memory area, or into a specified region or regions of upper memory. This is the same as `LH`.

LOWBAT Configure low battery warnings

HC Command Processor

LOW[BAT] state

If *state* is ON, the HC will check, each time the HC is switched on, for either of the batteries being low. On detecting a low battery, the HC will issue a warning. This will be in the form of an information message in the bottom right-hand corner of the screen.

If *state* is OFF, this behaviour will not take place. This is the default.

Workabout Command Processor

Not supported. On detecting a low battery when switched on, the *Workabout* will issue a warning. This will be in the form of an information message in the bottom right-hand corner of the screen. There is no command to switch this behaviour off. Use Shift-Ctrl-B for battery information at any time.

MS-DOS Command Processor

Not supported.

LPDEV List physical device drivers

Lists all specified physical device drivers.

HC Command Processor

Not supported. The `LPDEV` command lists both physical and logical device drivers.

Workabout Command Processor

LPDEV [device_spec]

The list includes all ROM-resident device drivers, as well as external ones that are currently loaded.

MS-DOS Command Processor

Not supported. The `MEM` command provides a similar function.

LPROC List processes

Lists information about all specified processes.

HC Command Processor

LPR[OC] [process_spec]

Workabout Command Processor

LPROC [process_spec]

This command is identical to that on the HC, except that the information is displayed slightly differently, (e.g. the number of matching processes is given).

MS-DOS Command Processor

Not supported. The `MEM` command provides a similar function.

LSEG List segments

Lists all memory segments currently in use by the specified process(es).

HC Command Processor

LSE[G] [process_spec]

Workabout Command Processor

LSEG [process_spec]

This command is identical to that on the HC, except that the information is displayed slightly differently, (e.g. the number of matches found is given).

MS-DOS Command Processor

Not supported.

MASTER **Display time and date of mastering****HC Command Processor**

MAS[TER]

Displays the time and date when the ROM was mastered.

Workabout Command Processor

Not supported. This command is not relevant since the ROM cannot be reprogrammed. the time and date of mastering is given, however, by the VER command.

MS-DOS Command Processor

Not supported.

MD **Make directory**

Make a directory. This command is **almost** identical on all three types of machine.

HC Command Processor

MD [system:][drive:]path

A trailing backslash **can** be used in the path component.

Workabout Command Processor

MD [system:][drive:]path

A trailing backslash **can** be used in the path component.

MS-DOS Command Processor

MD [drive:]path

A trailing backslash **cannot** be used in the path component.

MEM **Display free memory****HC Command Processor**

The identical FREE command must be used instead.

Workabout Command Processor

MEM

Displays the amount of free RAM in kilobytes that is available to programs. More detailed information on memory usage is available from the "Memory info" option of the "Info" menu in the System Screen.

MS-DOS Command Processor

MEM <etc>

Displays the amount of free and used RAM in kilobytes, or more specific aspects of memory usage.

MEMMAKER **Optimise computer's memory****HC Command Processor**

Not supported. Not relevant to SIBO machines.

Workabout Command Processor

Not supported. Not relevant to SIBO machines.

MS-DOS Command Processor

MEMMAKER <etc>

Optimises the computer's memory usage.

MENUCOLOR**Set startup menu colours****HC Command Processor**

Not supported.

Workabout Command Processor

The *Workabout* has a built-in menu system..

MS-DOS Command Processor

`MENUCOLOR <etc>`

Sets the foreground and background colours for the startup menu. Can only be used in *config.sys* files. MS-DOS 6.0 onwards.

MENUDEFAULT**Set startup menu item and timeout****HC Command Processor**

Not supported.

Workabout Command Processor

The *Workabout* has a built-in menu system.

MS-DOS Command Processor

`MENUDEFAULT <etc>`

Sets the default highlighted item on the startup menu, and the timeout. Can only be used in *config.sys* files. MS-DOS 6.0 onwards.

MENUITEM**Define startup menu item****HC Command Processor**

Not supported.

Workabout Command Processor

The *Workabout* has a built-in menu system.

MS-DOS Command Processor

`MENUITEM <etc>`

Defines an item on the startup menu. Can only be used in *config.sys* files. MS-DOS 6.0 onwards.

MKDIR**Make directory**

Makes a directory.

HC Command Processor

Not supported. The identical `MD` command must be used instead.

Workabout Command Processor

`MKDIR [drive:]path`

A trailing backslash **can** be used in the `path` component.

MS-DOS Command Processor

`MKDIR [drive:]path`

A trailing backslash **cannot** be used in the `path` component.

MODE **Configure system devices****HC Command Processor**

The `LINK` command and Communications Scripts can perform similar functions.

Workabout Command Processor

The `LINK` command and Communications Scripts can perform similar functions.

MS-DOS Command Processor

`MODE <etc>`

Configure system devices.

MORE **Display output one screenful at a time****HC Command Processor**

The Psion-Left key combination is used to pause output in the Command Processor.

Workabout Command Processor

The *Workabout* Command Processor pauses automatically after each screenful of output, except during batch file execution.

MS-DOS Command Processor

`MORE <etc>`

Displays output one screenful at a time.

MOVE **Move file(s)****HC Command Processor**

A combination of `COPY` and `DEL` must be used.

Workabout Command Processor

A combination of `COPY` and `DEL` must be used.

MS-DOS Command Processor

`MOVE <etc>`

Moves a file or files to a specified location.

MSAV **Scan for viruses****HC Command Processor**

Not supported.

Workabout Command Processor

Not supported.

MS-DOS Command Processor

`MSAV <etc>`

Scans for viruses.

MSBACKUP **Run backup program****HC Command Processor**

The MCLINK, RCom and PsiWin programs all include backup and restore facilities.

Workabout Command Processor

The MCLINK, RCom and PsiWin programs all include backup and restore facilities.

MS-DOS Command Processor

MSBACKUP <etc>

Runs the Microsoft Backup for MS-DOS program to backup or restore files, (MS-DOS 6.0).

MSCDEX **Provide CD-ROM access****HC Command Processor**

The MCLINK, RCom and PsiWin programs all include remote file access facilities.

Workabout Command Processor

The MCLINK, RCom and PsiWin programs all include remote file access facilities.

MS-DOS Command Processor

MSCDEX <etc>

Provides access to CD-ROM drives.

MSD **Provide technical details****HC Command Processor**

Not supported.

Workabout Command Processor

Not supported.

MS-DOS Command Processor

MSD <etc>

Provides technical details about your computer.

NLSFUNC **Load country-specific information****HC Command Processor**

The language data file may be changed by using the `CONFIG` command.

Workabout Command Processor

The characters available from the keyboard may be changed by defining the keyboard to use via the `SETDEF` command.

MS-DOS Command Processor

NLSFUNC <etc>

Loads country-specific information for national language support (NLS).

NOTIFY **Control whether the Notifier appears****HC Command Processor**

NOT[IFY] state

Controls whether the Notifier ever appears as a result of a file operation carried out by the Command Shell.

Workabout Command Processor

A notifier always appears when required.

MS-DOS Command Processor

Not supported.

NUMLOCK **Start with Num Lock on/off****HC Command Processor**

Not supported.

Workabout Command Processor

Not supported.

MS-DOS Command Processor

NUMLOCK [ON|OFF]

Specifies whether the Num Lock key is ON or OFF when the computer starts. Can only be used in *config.sys* files.

OFFENABLE **Enable off-key handling****HC Command Processor**

OFFE[NABLE] value

If *value* is 0, the Command Shell gives up its capture of the OFF key, thereby allowing other applications to capture this key to do their own processing of it.

If *value* is any non-zero number, the Command Shell attempts to capture the OFF key again.

Workabout Command Processor

The Window Server always captures the Off key.

MS-DOS Command Processor

Not supported.

PATH **Specify search path for executable files****HC Command Processor**

SIBO computers have built in search routines for executable files.

Workabout Command Processor

SIBO computers have built in search routines for executable files.

MS-DOS Command Processor

PATH <etc>

Specifies or displays the search path for executable files.

PAUSE **Suspend batch file processing**

Suspend batch file processing.

HC Command Processor

Not supported.

Workabout Command Processor

PAUSE [*text*]

Any associated message may be given in the *text*.

MS-DOS Command Processor

PAUSE

A "Press any key to continue" message is displayed, but a separate `ECHO` statement is needed to display any other associated message. MS-DOS 5.0 onwards.

POWER **Power saving set/display/on/off****HC Command Processor**

Power saving features are an integral part of SIBO machines. See the `AUTO` command, etc.

Workabout Command Processor

Power saving features are an integral part of SIBO machines. See the `SETDEF` command,.

MS-DOS Command Processor

`POWER <etc>`

Turns power-saving on and off, displays power saving status and sets power saving parameters.

PRINT **Print text file in background****HC Command Processor**

Other processes (tasks) may print while the Command Processor is being used.

Workabout Command Processor

Other processes (tasks) may print while the Command Processor is being used.

MS-DOS Command Processor

`PRINT <etc>`

Prints a text file as a background activity.

PROMPT **Change command prompt****HC Command Processor**

Not supported. Restricted screen size limits the practical size for the prompt.

Workabout Command Processor

Not supported. Restricted screen size limits the practical size for the prompt.

MS-DOS Command Processor

`PROMPT [text]`

Changes the appearance of the command prompt.

QBASIC **Run QBasic language****HC Command Processor**

Not supported.

Workabout Command Processor

Not supported. An OPL program editor and translator is provided in the ROM as standard, (see `EDIT`).

MS-DOS Command Processor

`QBASIC <etc>`

Runs the MS-DOS QBasic language interpreter.

QUIT **Exit current batch file only****HC Command Processor**

Not supported.

Workabout Command Processor

`QUIT`

Exits the current batch file only.

MS-DOS Command Processor

Not supported. Use `GOTO label` where `:label` is the last line of the batch file.

RD **Remove directory****HC Command Processor**

```
RD [drive:]path
```

Workabout Command Processor

```
RD [drive:]path [/y]
```

Deletes a directory, including any files in it (and subdirectories).

If the `/y` flag is used, no confirmation is asked for. This is intended for use in batch files.

MS-DOS Command Processor

```
RD [drive:]path
```

Deletes an **empty** directory only.

REASON **Get the cause of the last system shutdown****HC Command Processor**

Not supported. A message is, however, displayed automatically on switch-on after a system shutdown.

Workabout Command Processor

```
REASON
```

Returns a code indicating the cause of the last system shutdown.

MS-DOS Command Processor

Not supported

REM **Comment (remark) in batch file**

Comment (remark) in a batch file.

HC Command Processor

Not supported.

Workabout Command Processor

```
REM [text]
```

A semicolon (`;`) cannot be used instead of `REM`.

MS-DOS Command Processor

```
REM [text]
```

A semicolon (`;`) can be used instead of `REM` in `config.sys` files, but not batch files.

REN{AME} **Rename file(s)**

Changes the name of a file or files.

HC Command Processor

```
REN[AME] [drive:][path]filename1 filename2
```

Workabout Command Processor

```
REN [drive:][path]filename1 filename2
```

MS-DOS Command Processor

```
RENAME [drive:][path]filename1 filename2
```

or

```
REN [drive:][path]filename1 filename2
```


REPLACE **Replace file(s)****HC Command Processor**

Not supported.

Workabout Command Processor

Not supported.

MS-DOS Command Processor

REPLACE <etc>

Replaces the files in one directory with those of the same name from another directory.

RESTORE **Restore file(s)****HC Command Processor**

Not supported. Files are restored from a PC using MCLINK, RCom or PsiWin.

Workabout Command Processor

Not supported. Files are restored from a PC using MCLINK, RCom or PsiWin.

MS-DOS Command Processor

RESTORE <etc>

Restores backed up files from one disk to another, (MS-DOS 2.0 to 5.0).

RESUME **Resume a suspended process****HC Command Processor**

RES[UME] procname

Resumes the previously suspended process `procname`.

Workabout Command Processor

Not supported.

MS-DOS Command Processor

Not supported.

RMDIR **Remove directory****HC Command Processor**

Not supported. The `RD` command must be used instead.

Workabout Command Processor

RMDIR [drive:]path [/y]

Deletes a directory, including any files in it (and subdirectories).

If the `/y` flag is used, no confirmation is asked for. This is intended for use in batch files.

MS-DOS Command Processor

RMDIR [drive:]path

Deletes an **empty** directory only.

SCANDISK **Analyse/repair disk(s)****HC Command Processor**

Not supported. Not relevant to SSDs.

Workabout Command Processor

Not supported. Not relevant to SSDs.

MS-DOS Command Processor

```
SCANDISK <etc>
```

Runs the Microsoft ScanDisk program to analyse a disk or disks and repair any errors.

SET Set default path/environment variables

This command does completely different things on each machine.

HC Command Processor

```
SET path
```

Sets the system-wide default path.

Workabout Command Processor

```
SET [[var=[value]]|[varspec]]
```

Displays or sets the value of, or deletes, environment variables.

Equivalent to `ENV` on the HC.

There is no single command to set the default path on the *Workabout*. The drive letter followed by a colon should be used to set the current drive in the Command Processor or batch files, and the `CD` command to change the current directory.

MS-DOS Command Processor

```
SET [var=[string]]
```

Displays or sets the value of, or deletes, environment variables.

SETDATE Set date and time**HC Command Processor**

```
SETD[ATE] dd/mm/yy hh:mm:ss
```

Sets the date and time.

Workabout Command Processor

Not supported. Date and time must be set from the menu of the Command Processor or System Screen.

MS-DOS Command Processor

Not supported. Date and time must be set using the `DATE` and `TIME` commands.

SETDEF Alter system settings**HC Command Processor**

Not supported.

The machine configuration is set using the `AUTO`, `BACKLIGHT`, `BATTERY`, `CONFIG`, `LOWBAT`, `NOTIFY`, `OFFENABLE` and `WNOTIFY` commands. The configurability is completely different for the HC.

Workabout Command Processor

```
SETDEF [AMnn] [ABnn] [DDMY | DMDY | DYMD] [Dn] [K0 | K1] [S+ | S-] [T12 | T24] [TS+ | TS-]
```

Alter system settings, (which are otherwise set by menu options).

MS-DOS Command Processor

Not supported. Date and time formats are set in the country file, using the `COUNTRY` command.

SETVER Report MS-DOS version or display/update version table**HC Command Processor**

Not supported. Not relevant to SIBO machines.

Workabout Command Processor

Not supported. Not relevant to SIBO machines.

MS-DOS Command Processor

SETVER <etc>

Displays the MS-DOS version table. Reports a version number (earlier than the installed version) to programs or device drivers. Allows the version table to be updated.

SHARE Install file sharing and locking**HC Command Processor**

Built into the EPOC Operating System of all SIBO machines.

Workabout Command Processor

Built into the EPOC Operating System of all SIBO machines.

MS-DOS Command Processor

SHARE <etc>

Installs file sharing and locking capabilities on local and/or network drives.

SHELL Specify command interpreter**HC Command Processor**

Alternative command processors can be installed on HC machines - see the *Customising an HC* section of the *Introduction to the HC* chapter of the *HC Programmers Reference* manual.

Workabout Command Processor

Alternative command processors can be installed on Workabout machines - see the *Customising a Workabout* section of the *Introduction to the Workabout* chapter of the *Workabout Programmers Reference* manual.

MS-DOS Command Processor

SHELL <etc>

Specifies the name and location of the command interpreter to use. Can only be used in *config.sys* files.

SHIFT Shift batch file parameters

Moves the replaceable parameters of a batch file one position to the left. Thus %1 becomes %0, %9 becomes %8, etc.

HC Command Processor

Not supported.

Workabout Command Processor

SHIFT

MS-DOS Command Processor

SHIFT

SMARTDRV Setup/configure disk cache/buffering**HC Command Processor**

Not supported. Not relevant to SIBO machines using SSDs and RAMdrives.

Workabout Command Processor

Not supported. Not relevant to SIBO machines using SSDs and RAMdrives.

MS-DOS Command Processor

SMARTDRV <etc>

Sets up or configures MS-DOS SMARTDrive which creates a disk cache in extended memory, or performs double buffering.

SORT Read, sort and write data**HC Command Processor**

Not supported.

Workabout Command Processor

Not supported.

MS-DOS Command Processor

SORT <etc>

Reads input, sorts data and writes output to screen a file or another device.

START Start a process asynchronously**HC Command Processor**

Not supported. Processes are started asynchronously by simply entering their name, (unless preceded by &).

Workabout Command Processor

START procname

Launch the given process and return immediately.

Starts the first process found matching the specification in `procname`, (asynchronously).

MS-DOS Command Processor

Not supported. MS-DOS is not multitasking.

STOP Stop a process**HC Command Processor**

Not supported. This is identical to `TER[MINATE]` on the HC, except that `TER[MINATE]` only stops the first process matching the specification.

Workabout Command Processor

STOP procname [/y]

Terminates the named process or processes matching the specification in `procname`.

If the `/y` flag is used, no confirmation is asked for. This is intended for use in batch files.

MS-DOS Command Processor

Not supported.

SUBMENU Specify startup menu item as a submenu**HC Command Processor**

Not supported.

Workabout Command Processor

Not supported. The *Workabout* has a built-in menu system.

MS-DOS Command Processor

SUBMENU <etc>

Specifies an item in the startup menu as giving a submenu when selected. Can only be used in *config.sys* files. MS-DOS 6.0 onwards.

SUBST Associate path with drive letter**HC Command Processor**

Not supported.

Workabout Command Processor

Not supported.

MS-DOS Command Processor

SUBST <etc>

Associates a path with a drive letter.

SUSPEND Suspend a process**HC Command Processor**

SUS[PEND] procname

Suspends the first process found matching the specification in *procname*.

Workabout Command Processor

Not supported.

MS-DOS Command Processor

Not supported.

SYS Make a startup disk**HC Command Processor**

Not relevant to SIBO machines.

Workabout Command Processor

Not relevant to SIBO machines.

MS-DOS Command Processor

SYS <etc>

Creates a boot disk containing hidden system files, the command processor, etc.

TERMINATE Terminate a process**HC Command Processor**

TER[MINATE] procname

Terminates the first process found matching the specification in *procname*.

Workabout Command Processor

Not supported. Replaced by:

STOP procname

This is identical to `TER[MINATE]` on the HC, except that **all** processes matching the specification `procname` are terminated.

MS-DOS Command Processor

Not supported. MS-DOS is not multitasking.

TIME Display/(set) time

HC Command Processor

Not supported. `DATE` displays both the current system date and time.

Workabout Command Processor

`TIME`

Displays the current time, in the default format, or that specified by the most recent `SETDEF` or menu command. Time must be set via the menu system.

MS-DOS Command Processor

`TIME [hours:[minutes[:seconds[.hundredths]]][A|P]]`

Displays the system time or sets your computer's internal clock.

TREE Display directory graphically

HC Command Processor

Not supported.

Workabout Command Processor

Not supported.

MS-DOS Command Processor

`TREE <etc>`

Displays a directory graphically.

TYPE Type a text file

Prints a text or batch file to the screen.

HC Command Processor

`TY[PE] filename`

There is no provision for the display to pause itself automatically. However, the user can pause the display at any time, in the usual way, by pressing `PSION-LEFT`.

Workabout Command Processor

`TYPE filename`

The display pauses itself automatically after each screen full of text.

MS-DOS Command Processor

`TYPE filename`

UNDELETE Restore deleted files

HC Command Processor

Not available.

Workabout Command Processor

Not available.

MS-DOS Command Processor

UNDELETE <etc>

Restores files previously deleted using the DEL or ERASE command.

UNFORMAT**Restore a formatted disk****HC Command Processor**

Not available.

Workabout Command Processor

Not available.

MS-DOS Command Processor

UNFORMAT <etc>

Restores a disk previously erased by using the FORMAT command.

VER**Display software version numbers****HC Command Processor**

VER[SION]

Displays the (EPOC) Operating System version number, the (HC) ROM version number, and the (Command) Shell version number.

Workabout Command Processor

VER

Displays the (*Workabout*) ROM version number, the date and time that the ROM was mastered, the (EPOC) Operating System version number, the Shell version number and the Command Processor version number.**MS-DOS Command Processor**

VER

Displays the MS-DOS version number.

VERIFY**Turn disk write verification on/off****HC Command Processor**

Not available.

Workabout Command Processor

Not available.

MS-DOS Command Processor

VERIFY [ON|OFF]

Switches disk write operation verification on or off.

VOL**Display the disk volume label etc****HC Command Processor**

Not supported.

Workabout Command Processor

VOL [system:][drive:]

Displays the system, drive, volume label, media type, free space and total space for the disk volume in the current or specified drive.

MS-DOS Command Processor

VOL [drive:]

Displays the volume label and serial number of the disk volume in the current or specified drive.

VSAFE **Continuously check for viruses**

HC Command Processor

Not available.

Workabout Command Processor

Not available.

MS-DOS Command Processor

VSAFE <etc>

Continuously monitors the computer for viruses.

WAIT **Wait for a process to complete**

Wait until a process completes.

HC Command Processor

WAI[T]

The process cannot be named.

Workabout Command Processor

WAIT [procname]

A process name may be given if required.

Suspends the Command Processor until the applicable process completes.

MS-DOS Command Processor

Not supported. MS-DOS is not multitasking.

WNOTIFY **Configure Notifier appearance**

HC Command Processor

WNO[TIFY] state

Configures the appearance of the Notifier.

Workabout Command Processor

Not available.

MS-DOS Command Processor

Not supported.

XCOPY **Copy directories, subdirectories and files**

HC Command Processor

Not available.

Workabout Command Processor

Use COPY /s.

MS-DOS Command Processor

XCOPY <etc>

Copies directories, their subdirectories and the files in those subdirectories.

APPENDIX C

DIFFERENCES BETWEEN

THE SERIES 3A/3C SYSTEM SCREEN AND THE

WORKABOUT SYSTEM SCREEN AND COMMAND

PROCESSOR MENUS

Introduction

About this appendix

This appendix compares the Psion Series 3a/3c System Screen with the options of the *Workabout* System Screen and the *Workabout* Command Processor menus. Where relevant related Psion HC and Psion Siena features are also included. It is provided to highlight the differences between the machines so that developers may easily adapt to working with (and designing user interfaces for) the *Workabout*.

Principal differences centre on:

restricted screen size	menu names need to be abbreviated less options can be fitted on each menu the analogue clock is too big for the <i>Workabout</i> and Siena Status/Info windows icons are too big for the <i>Workabout</i> status window
different keyboard	certain keys are not present (Diamond, Icon buttons)
backlight	not present on the Series 3a or Siena, available on Series 3c variant
ports	the <i>Workabout</i> can have several ports
sound	the Series 3a/3c has digital sound recording and playback
built in applications	the Time and World applications are not present on the <i>Workabout</i> , (Data, Calc, Sheet, Program, RunOpl, Comms, Script and RunImg applications are present)

Note that the *Workabout* Command Processor is only mentioned where relevant since it has only a small number of menus, menu options and corresponding hotkeys.

Hotkeys

When assigning "hotkeys" ("accelerators") to certain key combinations in the applications that you write it is important to note the differences that exist between the Psion HC, the Series 3a/3c, Siena and the Workabout.

Psion-A **Assign button/Set auto switch off times**

Psion Series 3a/3c and Siena System Screen

The Psion-A hotkey brings up the 'Assign button to "Icon_button"' dialog, where "Icon_button" is the name above one of the Series 3a/3c icon buttons.

Workabout System Screen

There is no "Assign button" option on the 'File' menu. The Psion-A hotkey brings up the "Set auto switch off times" dialog instead.

Psion-B/Shift-Ctrl-B **Battery info**

Psion Series 3a/3c and Siena System Screen

The Psion-B hotkey brings up the 'Battery info' dialog in the System Screen only.

Workabout System Screen

The Psion-B hotkey does nothing. For battery information Shift-Ctrl-B can be used at any time.

Shift-Psion-D **Dialling**

Psion Series 3a/3c and Siena System Screen

The Shift-Psion-D hotkey brings up the 'Dial settings' dialog, (not present on the Siena).

Workabout System Screen

The Shift-Psion-D hotkey does nothing.

Shift-Psion-E **"Evaluate" format**

Psion Series 3a/3c and Siena System Screen

The Shift-Psion-E hotkey brings up the 'Set "Evaluate" format' dialog.

Workabout System Screen

The Shift-Psion-E hotkey does nothing.

Psion-F **Format disk/Time and date format**

Psion Series 3a/3c and Siena System Screen

The Psion-F hotkey brings up the 'Format disk' dialog.

Workabout System Screen

The Psion-F hotkey brings up the 'Format disk' dialog.

Workabout Command Processor

The Psion-F hotkey brings up the 'Set date and time formats' dialog.

Shift-Psion-F **Number formats/Time and date format****Psion Series 3a/3c and Siena System Screen**

The Shift-Psion-F hotkey brings up the 'Set number formats' dialog.

Workabout System Screen

The Shift-Psion-F hotkey brings up the 'Set date and time formats' dialog.

Workabout Command Processor

The Shift-Psion-F hotkey does nothing.

Psion-G **Create new group****Psion Series 3a/3c and Siena System Screen**

The Psion-G hotkey brings up the 'Create new group' dialog.

Workabout System Screen

The Psion-G hotkey does nothing. New application groups cannot be created on the *Workabout*.

Psion-K **Disc info/Toggle keyboard****Psion Series 3a/3c and Siena System Screen**

The Psion-K brings up the 'Disk info' window.

Workabout System Screen

The Psion-K brings up the 'Disk info' window.

Workabout Command Processor

The Psion-K hotkey toggles between 'Standard keyboard' and 'Special keyboard'. The text for this option in the associated menu changes accordingly.

Shift-Psion-N **Give 'Normal' system screen****Psion Series 3a/3c and Siena System Screen**

The Shift-Psion-N hotkey switches the System Screen to 'Normal' mode without the 'Memory used' bar at the bottom.

Workabout System Screen and Command Processor

Shift-Psion-N does nothing.

Shift-Psion-M **Give 'Memory' system screen****Psion Series 3a/3c and Siena System Screen**

The Shift-Psion-M hotkey switches the System Screen to 'Memory' mode with the 'Memory used' bar displayed at the bottom.

Workabout System Screen and Command Processor

Shift-Psion-M does nothing.

Psion-O **Auto switch off****Psion Series 3a/3c and Siena System Screen**

The Psion-O hotkey brings up the 'Set auto switch off times' dialog.

Workabout System Screen and Command Processor

Psion-O does nothing, (Psion-A is used instead).

Psion-P **Set owner information****Psion Series 3a/3c and Siena System Screen**

The Psion-P hotkey brings up the 'Set owner information' dialog.

Workabout System Screen

The Psion-P hotkey does nothing.

Psion-S **Set the sound****Psion Series 3a/3c and Siena System Screen**

The Psion-S hotkey brings up the 'Set the sound' dialog.

Workabout System Screen

The Psion-S hotkey brings up the 'Set the sound' dialog.

The 'Alarm sounds' option is not present because the *Workabout* does not have digital sound capabilities, unlike the Series 3a/3c.

Time:Psion-S/Shift-Psion-S **Set summer time****Psion Series 3a/3c and Siena System Screen**

To set the summer time on/off the hotkey is Psion-S within the Time application.

The Shift-Psion-S hotkey does nothing.

Workabout System Screen

To set the summer time on/off the hotkey is Shift-Psion-S (there is no Time application).

Workabout Command Processor

The Shift-Psion-S hotkey brings up the 'Set summer time' dialog.

Psion-T **Set file attributes/Set time and date****Psion Series 3a/3c and Siena System Screen**

The Psion-T hotkey brings up the 'Set file attributes' dialog. (Note that the Psion-T hotkey brings up the 'Set time and date' dialog in the Time application.)

Workabout System Screen

There is no 'Set file attributes' option on the 'File' menu. The Psion-T hotkey brings up the 'Set time and date' dialog instead.

Workabout Command Processor

The Psion-T hotkey brings up the 'Set time and date' dialog.

Psion-U **Usage monitor/Update lists****Psion Series 3a/3c and Siena System Screen**

The Psion-U hotkey brings up the 'Usage monitor' dialog.

Workabout System Screen

The Psion-U hotkey updates the lists of files displayed under each application icon.

Psion-V **About Series 3a/3c/Versions****Psion Series 3a/3c and Siena System Screen**

The Psion-V hotkey brings up the Series 3a/3c copyright screen, which shows the EPOC O/S version number.

Workabout System Screen

The Psion-V hotkey brings up the 'Software versions' window, which shows the ROM version number, the date and time the ROM was mastered, and the EPOC O/S version.

Shift-Psion-V**About application****Psion Series 3a/3c and Siena System Screen**

The Shift-Psion-V hotkey brings up the 'About"Application_name"' window for the currently highlighted application (with the name "Application_name").

Workabout System Screen

The Shift-Psion-V hotkey does nothing.

Psion-W**Password/Toggle wrap****Psion Series 3a/3c and Siena System Screen**

The Psion-W hotkey brings up the 'Set password' dialog.

Workabout System Screen

The Psion-W hotkey does nothing. A system password cannot be set on the *Workabout*.

Workabout Command Processor

The Psion-W hotkey toggles between 'Wrap on' and 'Wrap off'. Word wrap is only applicable to the *Workabout*'s restricted screen within the Command Processor.

Psion-X**Exit****Psion Series 3a/3c and Siena System Screen**

The Psion-X hotkey does nothing in the System Screen. The system Screen cannot be exited and is always a running process.

Workabout System Screen

The Psion-X hotkey brings up the 'Exit System Screen' dialog. The System Screen can be exited, since there is always at least one other process running (the Startup Shell).

Psion-Y**Printer****Psion Series 3a/3c and Siena System Screen**

The Psion-Y hotkey brings up the 'Printer configuration' window.

Workabout System Screen

The Psion-Y hotkey does nothing.

Psion-Diamond/Psion-Space**Caps lock on/off****Psion Series 3a/3c and Siena System Screen**

The Psion-Diamond hotkey switches Caps Lock on and off.

Workabout System Screen and Command Processor

The Psion-Space hotkey switches Caps Lock on and off, (there is no Diamond key). this is actually implemented in the Startup Shell process which runs in the background, so it applies to any application.

Psion-Tab/Shift-Psion-Tab Display full path in file-related dialogs**Psion Series 3a/3c and Siena System Screen**

To display the full path in file-related dialogs, Psion-Tab or Shift-Psion-Tab may be pressed.

Switch task

Psion HC

TASK switches forwards one task.

SHIFT-TASK switches backwards one task.

Psion Series 3a/3c and Siena System Screen

Shift-System (icon button) switches forwards one task.

Shift-Psion-System switches backwards one task.

Psion Workabout System Screen and Command Processor

Psion-Tab is used for task switching (forwards only).

On the Series 3a/3c this accelerator is used to display the full path in file-related dialogs..

On the *Workabout* Shift-Psion-Tab is used to display the full path in file-related dialogs, and does not switch backwards one task.

Menus

Some menu options that are present on the Series 3a/3c and Siena System Screen are not present on the *Workabout* System Screen, are on a different menu, or have a slightly different functionality.

File menu

Psion Series 3a/3c and Siena System Screen

- Copy file Brings up the 'Copy file' dialog, with 'Subdirectories' and 'Modified only' choices
- File attributes Brings up the 'Set file attributes' dialog.
- Backup files The 'File' choice list allows 'All' or 'Modified since last backup'.

Psion Workabout System Screen

- Copy file Brings up the 'Copy file' dialog, which does not have 'Subdirectories' and 'Modified only' choices, (restricted screen height).
- File attributes Not present.
- Backup files The 'File' choice list allows 'All' or 'Since last backup', (shortened to fit in window).

Disk menu

Psion Series 3a/3c and Siena System Screen

- Default disk Brings up the 'Set default disk' dialog.

Psion Workabout System Screen

- Default disk Not present (this option is on the 'Control' menu).

Apps menu

Psion Series 3a/3c and Siena System Screen

- Assign button Brings up the "'Assign button to 'Icon_button'" dialog, where "Icon_button" is the name above one of the Series 3a/3c icon buttons.

Psion Workabout System Screen

- Assign button Not present (there are no icon buttons on the *Workabout*).

Info menu

The differences are:

Psion Series 3a/3c System Screen

Set owner	Brings up the 'Set owner information' dialog.
Disk info	Displays Disk A , Internal disk I and Disk B.
Battery info	Brings up the 'Battery info' window.
Usage monitor	Brings up the 'Usage monitor' dialog.
About Series 3a/3c	Brings up the Psion Series 3a/3c startup screen, giving the Epos/OS version number and copyright dates.
About application	Brings up a window of information about the currently highlighted application.
Versions	Not present, (see 'About Series 3a/3c' above).

Psion Workabout System Screen

Update lists	(In the Series 3a/3c and Siena 'Set preferences' dialog)
Disk info	Displays Disk A , Internal disk I and Disk B.
Set owner	Not present. Owner details cannot be set on the <i>Workabout</i> .
Battery info	Not present. Battery information is obtained by pressing Shift-Ctrl-B.
Usage monitor	Not present. There is no usage monitor on the <i>Workabout</i> .
About Series 3a/3c	Not present, (see 'Versions' below).
About application	Not present.
Versions	The 'Software versions' window is presented, giving the ROM version number, date and time of mastering, and the Epos/OS version number. This, along with the copyright screen in the Startup Shell, replaces the 'About Series 3a/3c' option of the Series 3a/3c.

Psion Siena System Screen

Set owner	Brings up the 'Set owner information' dialog.
Disk info	Displays Disk A (external drive) and Internal disk I only.
Battery info	Brings up the 'Battery info' window.
Usage monitor	Brings up the 'Usage monitor' dialog.
About Siena	Brings up the Psion Siena startup screen, giving the Epos/OS version number and copyright dates.
About application	Brings up a window of information about the currently highlighted application.
Versions	Not present, (see 'About Siena' above).

Control menu

The differences are:

Psion Series 3a/3c System Screen

Sound	Brings up the 'Set the sound' dialog, which includes an 'Alarm sounds' choice.
Printer	Brings up the 'Printer configuration' dialog.
Auto switch off	Brings up the 'Set auto switch of' dialog - there are no backlight choices for the Series 3a/3c where a backlight not present, (options present for backlit Series 3c variant).
Dialling	Brings up the 'Dial settings' dialog.

"Evaluate" format	Brings up the 'Set "Evaluate" format' dialog.
Number formats	Brings up the 'Set number formats' dialog.
Set time and date	Not present - set from the Time application.
Time and date format	Not present - set from the Time application.
Status window	Brings up the 'Status window display' window - the 'Clock type' can be Digital or Analog.
Default disk	Not present - this option is on the 'Control' menu..

Psion Workabout System Screen

The name of this menu is abbreviated to 'Ctrl'.

Sound	Brings up the 'Set the sound' dialog - there is no 'Alarm sounds' choice, (the <i>Workabout</i> does not have digital sound capabilities).
Printer	Not present.
Auto switch off	Brings up the 'Set auto switch of times' dialog, which has three choices for the backlight.
'Dialling' option	Not present.
"Evaluate" format	Not present - moved to the 'Set preferences' option of the 'Special' menu.
Number formats	Not present - moved to the 'Set preferences' option of the 'Special' menu..
Set time and date	Brings up the 'Set time and date dialog'.
Time and date format	Brings up the 'Set time and date dialog'.
Status window	Brings up the 'Status window display' window - there is no 'Clock type' choice (only a Digital clock is allowed).
Default disk	Brings up the 'Set default disk' dialog.

Psion Workabout Command Processor

This menu contains 'Sound', 'Auto switch off' and 'Special keyboard' options only. The 'Special keyboard' option is implemented as a choice in the 'Preferences' option of the 'Spec' menu in the *Workabout* System Screen.

Psion Siena System Screen

Accessed from the 'Special' menu by using the 'Control...' option.

Sound	Brings up the 'Set the sound' dialog, which includes an 'Alarm sounds' choice.
Printer	Brings up the 'Printer configuration' dialog.
Auto switch off	Brings up the 'Set auto switch of' dialog - there are no backlight choices for the Siena (a backlight is not present).
Dialling	Not present - the Siena has a piezo buzzer, not a speaker.
"Evaluate" format	Brings up the 'Set "Evaluate" format' dialog.
Number formats	Brings up the 'Set number formats' dialog.
Set time and date	Not present - set from the Time application.
Time and date format	Not present - set from the Time application.

Info window	Brings up the 'Info window display' window - there are no 'Clock type' or 'Disk indicators' options because the Info window is too narrow, (it is otherwise identical to the Series 3a/3c Status window).
Default disk	Not present - this option is on the 'Control' menu..

Special menu

The differences are:

Psion Series 3a/3c System Screen

Set preferences	Brings up the 'Set preferences' dialog, which includes an 'Update lists' choice.
Password	Brings up the 'Set password' dialog.
Remote link / Communications	Brings up the 'Remote link' dialog - there is no 'Port' choice since the Series 3a/3c only has one port. (Note that the option is called Communications on the Series 3c and there is a 'Power setting' option, for Low and High Infrared power levels.).
Tips	On Series 3c only - to control whether a Tip is displayed when the machine is switched on.
Exit	Not present - the system Screen cannot be exited and is always a running process.

Psion Workabout System Screen

The name of this menu is abbreviated to 'Spec'.

Set preferences	Brings up the 'Set preferences' dialog, which does not include an 'Update lists' choice, but has the 'Number formats' and "'Evaluate" format' choices (on the Control menu of the Series 3a/3c and Siena), plus a 'keyboard' choice to swap between Standard and Special keyboards.
Password	Not present - you cannot set a system password on the <i>Workabout</i> .
Remote link	Brings up the 'Remote link' dialog - there is a 'Port' choice since the <i>Workabout</i> can be fitted with several ports. (Note that there is no 'Power setting' option, because there is no Infrared communications.)
Create new group	Not present - you cannot create groups on the <i>Workabout</i> .
Tips	Not present.
Exit	Brings up the 'Exit System Screen' dialog. The System Screen can be exited, since there is always at least one other process running (the Startup Shell).

Psion Workabout Command Processor

This menu contains 'Remote link', 'Wrap on/off', 'Zoom in', 'Zoom out' and 'Exit' options only. The 'Wrap on/off' option is not implemented anywhere in the *Workabout* System Screen menus. Because it toggles word wrap on and off, the text for this option changes from 'Wrap on' to 'Wrap off' accordingly.

Psion Siena System Screen

Control...	Brings up the Control menu, (which is not present on the menu bar).
Set preferences	Brings up the 'Set preferences' dialog, which includes an 'Update lists' choice.
Password	Brings up the 'Set password' dialog.
Communications	Brings up the 'Communications' dialog - there is no 'Port' choice since the Siena only has one port. There is a 'Power setting' option, for Low and High Infrared power levels. (Note that the option is called 'Remote link' on the Series 3a and <i>Workabout</i> .)
Tips	To control whether a Tip is displayed when the machine is switched on.
Exit	Not present - the system Screen cannot be exited and is always a running process.

'Diamond' menu

The differences are:

Psion Series 3a/3c and Siena System Screen

Normal Switches the System Screen to **not** show the 'Memory used' bar at the bottom.

Memory Switches the System Screen to show the 'Memory used' bar at the bottom.

Psion Workabout System Screen

This menu is not present, (there is no Diamond key, and the screen is of restricted height).

Time menu

The differences are:

Psion Series 3a/3c and Siena System Screen

This menu is not present. The 'Time and date', 'Summer times' and 'Formats' options are in the menus for the Time application.

Psion Workabout System Screen

This menu is not present. The 'Set time and date' and 'Time and date format' options are in the 'Ctrl' menu. 'Summer time' is incorporated as a choice in the 'Set time and date' dialog.

Psion Workabout Command Processor

This menu contains 'Time and date', 'Summer time' and 'Formats' options.

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