

The PMS E2P-6502 ELECTRON Second Processor

DISAPPOINTED BY THE SPEED OF YOUR ELECTRON?  
WOULD YOU LIKE AN ELK THAT PERFORMS LIKE A BEEB?  
IS SHORTAGE OF RAM GETTING YOU DOWN?  
UNABLE TO USE 80 COLUMN DISPLAY WITH VIEW?

If your answer is YES, then PMS have the answer.  
Look at this incredible specification....

- \* 300% SPEED INCREASE IN BASIC (MODE 0) \*
  - \* 3.5 TIMES MORE TEXT STORAGE IN VIEW (MODE 3) \*
  - \* 30K BASIC PROGRAMS IN ALL MODES \*
  - \* 'HI' LANGUAGES (BASIC & VIEW) GIVE 45K OF USABLE MEMO
  - \* 60K AVAILABLE FOR MACHINE CODE PROGRAMS AND DATA
  - \* RUN ACORNSOFT "CREATIVE GRAPHICS" AT BBC SPEED \*
  - \* SAVE ROM SLOTS - RUN BBC ROM BASED LANGUAGES FROM DISK/'
  - \* WORKS WITH SLOGGER TURBO - GIVING EVEN GREATER SPEED INC.
  - \* ABSOLUTELY NO MODIFICATIONS REQUIRED TO ELECTRON
  - \* SIMPLY PLUGS INTO A PLUS 1 SLOT \*
  - \* COSTS ONLY £89.00 inc VAT \*
  - \*\*\*\*\* THIS IS THE ULTIMATE 'ADD-ON' FOR THE ELECTRON \*\*
- If this does not impress you, turn over and read on.

#### WHY ADD A SECOND PROCESSOR?

It has long been realised, by companies such as ACORN, that the best way to increase the power of a computer is to add a Second Processor. This option has been available to BBC users for some time now, and a variety of Second Processors have been produced - Acorn 6502 and Z80 and Torch Z80 being examples.

Now PMS give ELECTRON users SECOND PROCESSOR POWER with the E2P-6502.

The E2P has a full 64K of dynamic RAM on board, and a 6502A processor running at 2MHz (the same as the BBC). If required, a CMOS 65C02 can be fitted by PMS, to give users access to the new 6502 instructions, as used on the MASTER.

#### IS IT SPEED YOU ARE AFTER?

Adding an E2P-6502 dramatically speeds up program execution on the Electron. This is achieved by sharing the workload of the computer. The Electron becomes an INPUT/OUTPUT (I/O) processor, handling the time consuming job of controlling the keyboard, disk drives, screen display, sound etc.. while the E2P gets on with the real computing - performing calculations, moving text about in a wordprocessor, sorting records in a database and generally running the language - only being interrupted from this task when absolutely necessary by the I/O processor.

A brief look at the standard Benchmark timings will prove that the Electron is no longer the BBC's sluggish little brother - a 300% SPEED INCREASE when using hi-resolution screen MODES. Programs which involve graphics manipulation show even greater speed increases, and some programs will actually run significantly faster on the Electron with E2P than on the BBC! This is due to a degree of parallel processing taking place, the E2P doing the calculations while the Electron draws the pictures.

#### LOOKING FOR MORE MEMORY?

Increased speed is only one of the benefits obtained by adding the E2P. Equally as important is the huge increase in the amount of RAM available for user applications. On a standard Electron with a PLUS 3, using a high resolution screen mode, as little as 3.5K is free for programs, data or word processing text. The E2P increases this available memory to AT LEAST 30K in ALL screen modes. With HI versions of languages (HIBASIC or HIVIEW) a massive 45K is free. The maximum amount of RAM is available to machine programmers who can directly access an enormous 60K for programs and data.

These large amounts of RAM become available again because of the sharing out of workload. With an E2P fitted, all the Electron RAM is dedicated to I/O processes - disk workspace, screen memory, expanded character sets, soft key buffers etc.... The memory claimed for these purposes in the Electron is free for user applications in the E2P.

In BASIC PAGE sits at &800, and HIMEM is at &8000 irrespective of the screen MODE in use. In Electron HIBASIC - available from PMS - PAGE=&800 and HIMEM=&B800!! and VIEW has 30462 bytes free in all MODES when running on the E2P.

#### TECHNICAL DETAILS

The E2P plugs into either of the Electron's PLUS 1 slots, with absolutely NO MODIFICATIONS required to the Electron. The E2P communicates with the Electron via the Electron TUBE byte at &FC5, and by a page of memory located at &8000 in the Electron. This page is mapped into &FF00 in the E2P. All the Acorn TUBE protocols are supported by the E2P Operating System, which is located from &2800 to &3000 in the Electron. The operating system can be loaded from tape or disk at power-up, or alternatively PMS can supply the E2P Operating System on ROM.

The default language - BASIC, VIEW, COMAL etc, in the Electron, is automatically copied over the TUBE into the E2P on a hard-break or when the language is initialised by a STAR command, eg \*WORD. Certain languages may be directly \*LOADED into the E2P and do not require the presence of the language in ROM in the Electron. For Example, HIBASIC can be directly \*LOADED to &B800 in the E2P.

The E2P Operating System implements full 32 bit addressing for filing commands. Addresses in the Electron are prefixed by &FFFF, and addresses in the E2P by &0000 (leading zeros may be omitted). To save the screen the command might be - \*SAVE"screen" FFFF3000 FFFF8000. To save a block of RAM in the E2P the command might be - \*SAVE"memory" 2000 3000. Basic programs will automatically be loaded to PAGE, no matter what address they were saved from.

The E2P is compatible with the SLOGGER TURBO, and if used in conjunction with the TURBO, gives the Electron/E2P combination a further boost in speed!!

The E2P will not function if auto-select sideways RAM is fitted to the Electron.

The following languages have all been tested on the E2P - BASIC, HIBASIC, VIEW, HIVIEW, VIEWSHEET, VIEWSTORE, COMAL, ULTRACALC, PROLOG, ISO-PASCAL, LISP, Acornsoft LOGO, MICRTEXT Plus (non-mode7), and other software which has been written to Official Acorn TUBE protocols will also run.

**BENCHMARK TIMINGS**

Benchmark	Electron		PMS-E2P	BBC B
	MODE 6	MODE 0	ALL MODES	
1	0.9	2.1	0.7	0.8
2	4.0	9.4	2.9	3.1
3	11.5	27.0	8.4	8.3
4	12.3	28.9	8.9	8.7
5	12.9	30.2	9.4	9.1
6	19.5	45.7	14.4	13.7
7	30.1	69.9	22.2	21.3

**ORDERING THE E2P-6502**

The E2P-6502 costs £89.00 including VAT plus £2 post and packing, this includes a comprehensive User Guide, which covers all aspects of the Second Processor. The E2P has a full 6 months guarantee.

Please use to Order Form below, and remember to state the medium you wish the E2P Operating System placed on. The 5.25in disk are dual 40/80 track format.

---

**E2P-6502 Second Processor ORDER FORM**

Please sent me \_\_\_\_\_ E2P-6502 Second Processor(s) at £89.00 + £2 P&P.

I enclose cheque/postal orders for a total of £ \_\_\_\_\_.

OR

Please debit my ACCESS account by £ \_\_\_\_\_.

A/c No. \_\_\_\_\_ Expiry date \_\_\_\_\_

NAME \_\_\_\_\_ SIGNED \_\_\_\_\_

ADDRESS \_\_\_\_\_

POSTCODE \_\_\_\_\_

E2P Operating System required on:  
5.25in disk/3.5in disk/tape/ROM. (delete as required)

CHEQUES SHOULD BE MADE PAYABLE TO 'PERMANENT MEMORY SYSTEMS'

Send to: Permanent Memory Systems, 38 Mount Cameron Drive,  
St Leonards, EAST KILBRIDE, G74 2ES  
Please allow 28 days for delivery.